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The Impact of Structure and Meaning in Reading Comprehension Among Gifted Students

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Abstract: The aim of this study was to evaluate the impact of structure (passive and active), meaning (known and unknown) of reading and comprehension at both levels of literal and interpretative among gifted students. A sample of (160) gifted individuals were selected. Students were divided into four experimental groups. Materials from a tenth grade text book was chosen and modified as sentences of (passive and active voice statements), in addition to the meaning of (commonly used and not commonly used vocabularies) were applied, further modification between the two variables applied in which all possibilities were included. The results of this study indicated that: statistical significant values were present in the understanding of reading both literal and interpretive of the passive voice sentences among gifted individuals. Also, a statistical significant indication was evident in the binary interaction of sentences built from the true meanings and the structure complexity of sentences. On the other hand, no statistical significant differences were found among gifted students on the level of literally understanding and interpretation. Also no statistical significant was found between the binary interaction of the structure of the sentences and the direct meaning of such sentences among the groups of gifted students.

INTRODUCTION

Reading is an important and necessary skill for a successful life. The learning and education process is considered to be the fundamental foundation in which reading is based on, as it is the most important academic skill that is taught at school levels. Without mastering the reading skills, a negative impact and the misleading of information among all subjects and interest in education would be reflected negatively (Harste, 1985). Reading is the first pillar upon which other learning skills follow, as the learner develops and enriches his experience through reading.

Reading is a lingual skill as it allows the reader to understand written text, it is an intellectual, visual and cognitive process (Burns *et al.*, 1998). Reading is not a purely automatic process with limited boundaries to know letters, words and pronunciations. It is a complex process like all mental processes; requiring the reader to integrate and interact with the reading text. As a result, the reader can interpret, evaluate and respond to what's been read and understand the sequences of processes in the general terms (Burns *et al.*, 1998).

Understanding reading is an important mental skill linked to the educational process and is the most influential in academic achievement and success in various educational tasks. As a result this subject has acquired the interest of educators, psychologists and researchers for many years. They have studied the components and factors of understanding reading and its influence on the capabilities of reflection upon the reader. McCarthy (1990) indicated that reading comprehension is a complex way in dealing with information, described as a multi-dimensional activity that seeks to build semantic conception of what is being heard or read, through the conversion and the selection of reading and re-organization structure of the mind in order to form identical or similar to those frequented by the author. Robinson (1968) characterized the reading comprehension as an active mental process that requires readers to criticize meaning, test of ideas and the ability to make conclusion and generalization. While, Barrett (1972) indicated that the reading is a complex mental process which depends on mental reliance more than perception.

The reading comprehension process begins by understanding the literal meaning of the symbols of language as understood by the reader in the light of the succession of the vocabulary and grammatical relations among them. This is the level in which the reader gathers the vocabulary with each other, knowing it as a complete language package, to give each of the vocabulary their true meaning in the context and realizes what is the true

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meaning of the vocabulary words in its distinguished position in the sentence, this level is called line reading. On the other hand, reading between the lines can be defined as the level of identification of the writer's ideas as it helps making decisions concerning the meaning of the vocabulary in the sentence. After this stage, the reader moves beyond the limits of reading between the lines and rises to the level of reading beyond the lines. The reader then moves beyond the limits of absorptive surface of the text meaning, to draw ideas and apply such ideas from the text that has been read (Carlisle and Rice, 2002).

Reading comprehension involves a group of mental abilities, it is a complex mental process which contains mental and sensory components. There have been several attempts to identify the components of the reading comprehension process. For example, Lennon (1960) selected four components of the reading comprehension process: knowledge of vocabulary, understanding the apparent meaning, understanding implication meanings and assessment of the work in order to reveal the writer's meaning. While Goodman *et al.* (1988) selected six components of the process of reading comprehensions; perception, memory, thinking and analytical synthesis, application and evaluation.

Reading comprehension is influenced by a number of factors and despite the different views about the factors affecting the reading comprehension process the majority of these views emphasizes on the important characteristics of reading and the characteristics of the reader, as well as the type and method of teaching used. The phrase "structure" used in this study indicates the rules of the structure of the sentence. As the reader is familiar with the grammatical rules, this helps the reader to improve the comprehension of the text contents. Sentence meaning is drawn from combinations of grammar and vocabulary. This provides two meanings of the phrase: first is the grammatical meaning and second is the general meaning. Both meanings are significantly important. For example; If the reader understands the meanings of words in the phrase but does not understand the overall meaning of the sentence because he/she does not understand the grammatical meaning, this could develop an obstacle of interpretation of the sentence. If the reader does not understand the nature of relations between the words per sentence, this hampers the understanding of the phrase and the text in general. It is difficult for the reader to understand a lot of sentences as a result of the inability to analyze the grammatical structure (Friedman and Gvion, 2003). The results of the previous studies showed that reading comprehension affected by the composition, reading comprehension of sentences and

texts with grammatical structures is grater than those with complex grammatical structures (Abrahamsen and Shelton, 1989; Hawas, 1990; Gillon and Dodd, 1995; Boland, 1997; Nassaji, 2003).

A single word may have more than one meaning. A dictionary of any language will provide more than one meaning for any specific word of interest. There is no doubt that these meanings are related to each other and its easy to detect but the common use of the word makes it look as independent from the rest of the meanings. It is confirmed that reading comprehension can be achieved only if the reader is able to interpret vocabulary, phrases and analyzes provisions of meanings and connotations of the evidence through the use of semantic context. The results of previous studies showed that reading comprehension of sentences is affected by the meaning. On the other hand, understanding reading comprehension of sentences and texts with known vocabulary is grater than those with unknown vocabulary (McDaniel and Presley, 1989; Abrahamsen and Shelton, 1989; Hawas, 1990; Thomas and Allen, 1991; Gillon and Dodd, 1995; Senechal *et al.*, 1995; Boland, 1997; Hulstijn and Laufer, 2001; Nassaji, 2003).

The student's ability to possess an understanding in reading comprehension is one of the most important factors in the success of learning materials. Weakness in reading comprehension threatens the academic achievement especially at the primary stage and the upper secondary level, at this stage students depend on reading comprehension more than listening comprehension. By the end of the elementary school level, students are expected to be at a good reading comprehension level, a skill which makes it easier for them to use the language without hardship and trouble in learning different school subjects. Reading comprehension is affected by many factors including topics and subjects that have been read as it appears from the grammatical and semantic sentence prospective. The complexity of the sentences within the text may hinder the process of reading comprehension of such texts, especially when the reader does not have enough grammatical and structural background in the reading process. Also the meaning of vocabulary words play a major role in reading comprehension among students since lingual weakness among readers impede the ability to assimilate the reading text.

The present study demonstrates the impact of the structure and meaning in reading comprehension through two levels: literal and interpretive.

Reading comprehension leads to an active role in students learning during the primary stage of their studies of different materials, enhancing the development of their ability to think and solve problems. The current research

derives its importance as it deals with reading comprehension among gifted students at the end of their primary school level, which is the final stage prior to the start of their secondary school, as it requires more capacity to deal with the written text by acquiring extensive understanding and involves more comprehension in reading skills. This research evaluates a range of factors affecting reading comprehension, as it is considered one of the most important mental skills directly and closely related to the educational process of learning. The intension of this research is to provide significant suggestions to the authors of school curriculums for gifted individuals, in order to incorporate suitable approaches for educators and teachers to identify with such a distinguished group of students.

This study is intended to achieve the following objectives and answer important questions:

- To examine the impact of passive and active voice in the reading comprehension at both levels literal and interpretative among gifted students
- Examine the impact of meaning (known vocabulary and unknown vocabulary) in the reading comprehension at both levels literal and interpretative among gifted students
- Are there differences in reading comprehension literal level among gifted individual students due to both the structure, meaning and the interaction between the two?
- Are there differences in the reading comprehension at interpretative level among gifted individual students due to both the structure, meaning and the interaction between the two?

MATERIALS AND METHODS

The aim of this study was to evaluate the impact of structure (passive and active), meaning (known and unknown) of reading and comprehension at both levels of literal and interpretative among gifted students. During the second semester of the school year 2009, a sample of (160) gifted individuals students were randomly selected form governmental high schools in Amman Jordan for this study. Students were divided into four experimental groups. Materials from a tenth grade text book was chosen and modified as sentences of passive and active voice statements, in addition to the meaning of commonly used and not commonly used vocabularies were applied, further modification between the two variables applied in which all possibilities were included.

All members of the study sample groups completed the reading test composed of fifty-five multiple choose

questions measuring the understanding of reading the literal and interpretive statements and sentences.

Analysis of variance (2-Way ANOVA) and the statistical test (F) factor design (2×2) were used in this study. Applications of two independent variables are identified as: The structure of the sentences and the meaning of the sentences. The structure variable consists of two levels as (passive and known verbs). On the other hand, the meaning consists of two levels (recognized and un-recognized) vocabulary terms. This is molded with the reading comprehension variable at the levels of literal and interpretive. To ensure the authenticity of the texts, ten arbitrators specializing in the Arabic language were asked for their opinion on the text materials and for any modification and adjustments as they deemed appropriate to provide absolute clarity for the intended use of the text content. The appropriate adjustments and modifications were made in the light of the observations expressed by the arbitrators. It is worth mentioning that the proportion of agreement between the arbitrators were 100% in regards to the amendment concerning structure and 90% of the amendment concerning meaning. The reviewed and approved text materials were arranged from the structure and the meaning prospective to provide four texts with different formulation but to provide quite similarity in the ideas.

Four contents of the generated texts were as follows:

First text : Active voice structure, with unknown vocabulary terms
Second text : Passive voice structure, with unknown vocabulary terms
Third text : Active voice structure, with known vocabulary terms
Fourth text : Passive voice structure, with known vocabulary terms

The present test was prepared for measuring the reading comprehension at both levels: the literal and interpretive to basic tenth grade students. The test consisted of 55 multiple choose questions divided into two groups; twenty eight multiple choose questions measuring reading comprehension at literal level and 27 questions measuring the reading comprehension at the interpretation level.

The test questions for the reading comprehension on the literal level were designed to measure the ability of the reader to state main ideas, important details and summarize them. While the rest of the questions used at the interpretative level to measure the ability of the reader to understand the relations between events, causes and results and to predict the expected results or outcomes.

From the educational psychology, measurement and evaluation prospective the multiple choose questions were evaluated by specialized arbitrators as requested to evaluate and modify the following identity of the testing materials and questions:

- The level of reading comprehension which is classified within each question (literal and interpretative applied)
- To make any other appropriate comments

In the light of the observations expressed by the arbitrators, appropriate adjustments were carried out and adopted to classify each question into one of the reading comprehension levels (literal and interpretive applied). Finally, the agreement among arbitrators reached 93% of the presented questions.

Reliability of the test: Reliability tests were conducted on a random sample of forty students from the tenth grade from outside the primary study sample group. The overall coefficient of reliability on the reading comprehension questions reached (0.83) and the value of the coefficient of reliability for the reading comprehension on the literal level reached (0.81). Meanwhile, the coefficient of reliability for the interpretative level was (0.84). The reliability coefficient was calculated using the mid-term retail. The internal consistency test after Spearman-Brown corrected equation was used as its coefficient reached (0.81). The values of different investigated coefficients indicated above are considered appropriate for the purposes of the study.

The study samples were randomly divided into four groups, of forty students and with random distribution of various texts to the students.

The content of various texts were given to each group as follows:

- The first group was introduced to two text versions with active voice and unknown vocabulary terms
- The second group was introduced to two text versions with passive voice and unknown vocabulary terms
- The third group was introduced to two text versions with active voice and known vocabulary terms
- The fourth group was introduced to two text versions with passive voice and known vocabulary terms

Evaluation of test results: A model key answer was used to correct the multiple choice test questions. Each multiple choice question had four alternative answers, only one was correct. One point was allocated for the correct answer and zero for the wrong answer. This showed a differentiation grade between students scores in the reading comprehension test at the literal level from zero to 28) points and differentiation between students scores in the reading comprehension at the interpretative level from zero to 27 points.

RESULTS AND DISCUSSION

The major questions to be addressed are:

First : Are there differences in the literal-level comprehension of the texts presented to gifted students due to the structure, meaning and the interaction between them?

Second : Are there differences in the reading comprehension interpretative level for texts presented to gifted students due to both the structure and meaning and the interaction between them?

To answer these questions, average and standard deviations were calculated as shown in Table 1. It is clear that the average point of reading comprehension groups of the study sample varied and to examine whether these differences in reading comprehension literal level statistically significant, a bilateral one-way analysis of variance of variables (2-Way ANOVA) on factor design (2×2) considering that structures as independent variables has two levels (known verb and passive verb) and the meaning independent variables has two levels (known vocabulary terms and unknown vocabulary terms). The dependent variable was the level of literal reading comprehension.

Table 2 shows the following:

- The presence of a significant statistical impact of the structure in the reading comprehension on the literal

Table 1: Mean±SD for the scores of students on the reading comprehension test at the literal level classified according to the variables of structure and meaning

Variables	Mean±SD
Structure	
Active	19.62±3.21
Passive	20.85±3.05
Meaning	
Unknown Vocabulary terms	20.43±3.14
Known vocabulary terms	20.03±3.23
Structure	
Active	
Known vocabulary terms	18.80±3.25
Unknown vocabulary terms	20.45±2.99
Passive	
Unknown vocabulary terms	20.42±3.32
Known vocabulary terms	21.27±2.72

Table 2: Results of analysis of variance (2-Way ANOVA) of the differences between the means of the student grades in reading comparison literal reading comprehension

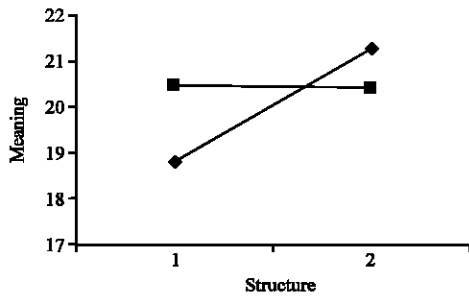| Source	Sum of squares	df	Mean square	F-value	Sig.
Structure	60.025	1	60.025	6.310	0.013
Meaning	6.400	1	6.400	0.673	0.413
Structure×meaning	62.500	1	62.500	6.570	0.011

Fig. 1: The effect of interaction between the variables of structure and meaning in the literal reading comprehension

Table 3: Means±SD for the scores of students on the reading comprehension test at the interpretative level classified according to the variables of structure and meaning

Variables	Average	SD
Structure		
Active	16.72	2.97
Passive	18.76	2.51
Meaning		
Unknown vocabulary terms	18.08	2.96
Known vocabulary terms	17.40	2.86
Structure×meaning		
Active		
Unknown vocabulary terms	17.10	3.31
Known vocabulary terms	16.35	2.56
Passive		
Unknown Vocabulary terms	19.07	2.20
Known vocabulary terms	18.45	2.79

Table 4: Results of analysis of variance (2-Way ANOVA) of the differences between the means of the student grades in reading comprehension interpretative level test

Source	Sum of squares	df	Mean square	F-value	Sig.
Structure	166.056	1	166.056	21.965	0.000
Meaning	18.906	1	18.906	2.501	0.116
Structure×meaning	0.156	1	0.156	0.021	0.886

level, the value of F was (6.31) with statistical value of (0.05). This indicates that there are significance differences in the reading comprehension on the literal level of the texts presented to gifted students for structure, in favor of passive voice

- The presence of a significant statistical impact of the interaction of the binary (meaning x structure) in the reading comprehension on the literal level, the value of F reached (6.57) with statistical value of (0.05)

Figure 1 shows the effect of interaction between the structure and methods in reading comprehension among gifted students to the result of the adoption of one formal vocabulary (known and unknown) varies according to the structure (passive verb and known verb). Literal reading comprehension to the texts of unknown vocabulary and active voice reached (20.45) more than literal reading comprehension of texts with known vocabulary and active voice (18.80) while literal reading comprehension of texts with known vocabulary and passive verb structures (21.27) more than literal reading comprehension of texts with unknown vocabulary terms with passive verb structure. (20.42). The absence of a significant statistical impact of the meaning in the reading comprehension on the literal level, F value was (0.67) with statistical level (0.05).

To answer the second question which states: Are there differences in the reading comprehension interpretative level for texts presented to the gifted students due to both the structure, meaning and the interaction between them?

Average and standard deviations for students were calculated to test the point of the reading comprehension at the interpretative level according to variable structures and meaning, as shown in Table 3.

Table 3 shows that the average point of reading comprehension at the interpretative level for the study sample groups varied. To examine whether these differences in the reading comprehension at interpretative level is statistically significant, a bilateral one-way analysis of variance of variables (2-Way ANOVA) on F Factor Design (2×2).

Table 4 shows the results of the analysis of variance of the differences between the three averages of the grades of students to test reading comprehension at the interpretative level. The presence of a significant statistical impact of the structure in the reading comprehension at the interpretative level, F value was (21.96) and it is a statistical indicator at (0.05). This proves that there are significant statistical indicators showing differences in the reading comprehension at the interpretative level of texts for the gifted students as attributed to the benefits of passive structures. The absence of a significant statistical impact of the interaction of the meaning of the binary (meaning×installation) in the reading comprehension at the interpretative level. F value reached (0.21) and is not statistically significant at the level (0.05).

The results of the current study shows that there are statistically significant differences in the reading comprehension at both literal and interpretative levels among gifted students due to the structure. It was found

that the average point of reading comprehension (literal and interpretive) among members of the sample group who were subjected to texts with passive structures scored more than the average of those who have been subjected to texts with known verb structures.

We can attribute the superiority in the reading comprehension in the event of the known verb structures to the nature and characteristics of gifted students as they tend to deal with complicated and challenging issues with enjoyment and ease. Simple and clear issues do not motivate them and do not meet the desires of knowledge and excitement that they tend to look forward to. Therefore, structures with known verbs do not leave a vacuum cognitive to the reader; because the perpetrator is known. Keeping in mind that any ideas presented in a simple way and free of excitement or thrills compel the reader loses interest during the reading of the text. Such action reflects on the reader thus becoming less inclined to read, less attentive and not focused. This in return limits the reader's ability to follow and understand ideas, statements or events as it makes the reader unable to realize the relations between causes, results, or conclusions. Such circumstances lead to low scores or failure in the performance of the reading comprehension test.

In the case of passive structures, the absence of the character develops a missing link which leaves the reader with an unclear picture of knowledge. This in return becomes as a puzzle to be solved by the reader as it provides an excitement and incentive among the gifted students making them pay more attention to details in the text and to focus more. This would increase the ability to follow and understand ideas to evaluate relations between causes, results and conclusions.

The results of this study revealed that no statistical significant differences in the reading comprehension among gifted students in terms of the meaning. This indicates that the ability and capacity of gifted students is at a higher level thus helping them to understand the meaning of unknown vocabulary terms right from reading the texts.

As a result, the time and effort the reader spends in search for the meaning of unknown vocabulary through context to collect ideas and to sequence the events through known vocabulary forces the reader to focus, concentrate and reflect while reading, in order to follow and understand the ideas and reach appropriate conclusions.

Generally, if the reader lacks a sufficient bank of vocabulary meanings the reader is obligated to spend more time and effort in search for the general meaning through context. This approach leads to the inability to understand meanings from the context itself, especially when the text repeats more unknown vocabulary leading to a state of complexity and uncertainty. This in turn creates a state of frustration and tension to the reader, the reader becomes less attentive and less focused. Limiting the ability to follow and understand ideas and meanings weakening the realization of the relations between causes and results to reach conclusions, which leads to failure of performance on the reading comprehension test.

These results found no statistical significant differences in the reading comprehension attributed to the meaning. This study differed with the findings of McDaniel and Presley (1989), Hawas (1990) and Thomas and Allen (1991) which revealed that superiority of reading comprehension in the event of the present of known vocabulary terms more than in the case of unknown vocabulary terms. The study of Gillon and Dodd (1995), indicated that a significant statistical impact was present when the reader understood the meanings of words in the reading comprehension.

More emphases relating to the importance of the readers ability to understand meanings of vocabulary in reading comprehension was indicated by many researchers such as; Senechal *et al.* (1995), Boland (1997) and Nassaji (2003).

This research differed from previous studies as the tests were conducted on gifted individuals rather than random ordinary people. A statistical significance of the interaction of the binary (meaning×structure) in the reading comprehension at the literal level was also evident in this study.

CONCLUSION AND RECOMMENDATIONS

Literal reading comprehension among gifted students results in the adoption of one formal vocabulary (known and unknown) as it varies according to the structure (known and passive verbs). For gifted students it was found that text literal reading comprehension of unknown vocabulary and passive structures are more understandable than literal reading comprehension with known vocabulary and passive voices, as well as literal reading comprehension texts with known vocabulary and passive structures.

This could be attributed to the high level of literal understanding to remember the main ideas and important details with sequencing. As the tested gifted students are able to become more involved in evaluating the meaning of passive voices with the complications of unknowing vocabulary. This limits the ability to remember details presented in the text. As a result the effort is dispersed by

filling the known information and derivation of the meanings of unknown vocabulary from the general statements presented. On the other hand, a text introduced to gifted students which consists of active voices and simple vocabulary would make them loose interest and concentration, leading to poor performance in the outcome and final results of the test.

- Enrich texts presented to gifted students with passive verb structure to increase motivation and develop literal and interpretative reading comprehension skills
- Avoid the use of passive structures in the event of a large number of complex vocabulary terms in the text; as it may limit the ability of the gifted students to understand literal reading comprehension
- Enrich texts presented to gifted students with complex vocabulary terms especially when the structures are known

REFERENCES

Abrahamsen, E.P. and K.C. Shelton, 1989. Reading comprehension in adolescents with learning disabilities: Semantic and syntactic effects. J. Learn. Disabilities, 22: 569-572.

Barrett, T.C., 1972. Taxonomy of Reading Comprehension. University of Chicago, Chicago.

Boland, J.E., 1997. The relationship between syntactic and semantic processes in sentence comprehension. Language Cognitive Processes, 12: 423-484.

Burns, P.C., B.D. RoeElinor and P. Ross, 1998. Teaching Reading in Todays Elementary Schools. 7th Edn., Houghton Mifflin Co., Boston, New York, ISBN-10: 0395903475, pp: 625.

Carlisle, J.F. and M.S. Rice, 2002. Improving Reading Comprehension: Research-Based Principles and Practices. York Press Inc., Baltimore, ISBN-13: 978-0912752709, pp: 290.

Friedman, N. and A. Gvion, 2003. Sentence comprehension and working memory limitation in aphasia: A dissociation between semantic-synatic and phonological reactivation. Brain Language, 86: 23-39.

Gillon, G. and B. Dodd, 1995. The effects of training phonological semantic and syntactic processing skills in spoken language on reading ability. Language Speech Hearing Services Schools, 26: 58-68.

Goodman, Y.M., D.J. Watson and C.L. Burke, 1988. Reading Strategies Focus on Comprehension. Holt, Rinehart and Winston, New York.

Harste, C., 1985. A State of the Art Assessment of Reading Comprehension Research. Indiana University Press, Bloomington.

Hawas, H.M., 1990. Vocabulary and reading comprehension: An experimental study. ITL. Rev. Applied Linguistics, 87-88: 45-63.

Hulstijn, J. and B. Laufer, 2001. Some empirical evidence for the involvement load hypothesis in vocabulary acquisition. Language Learning, 51: 539-558.

Lennon, R.T., 1960. What Can be Measured?. In: The Role of Test in Reading: Proceedings of Annual Education Conference, Stauffer, R. (Ed.). University of Delaware Press, New York.

McCarthy, M., 1990. Recent direction in vocabulary teaching. Language Teacher, 14: 9-11.

McDaniel, M.A. and M. Presley, 1989. Keyword and context instruction of new vocabulary meanings: Effects on text comprehension and memory. J. Educational Psychol., 81: 204-213.

Nassaji, H., 2003. Higher-level and lower-level text processing skills in advanced ESL reading comprehension. Modern Language J., 87: 261-276.

Robinson, H., 1968. The Next Decade in Reading Instruction. University of Chicago Press, Chicago.

Senechal, M., E. Thomas and J. Monker, 1995. Individual differences in 4-year-old childrens acquisition of vocabulary during story book reading. J. Educ. Psychol., 87: 218-229.

Thomas, A. and B. Allen, 1991. The feasibility of an information-processing methodology for the assessment of vocabulary competence. J. Instructional Psychol., 4: 306-313.