Effect of Processing Level on False Memory and Recall in Bandar Abbas Islamic Azad University Students

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ABSTRACT

The aim of this research is study the effect of processing level on recall and false memory in students of Islamic Azad University, Bandar Abbas. The main hypothesis of the research is: processing levels (surface and deep or semantic) affect recall and false memory of students studying different academic subjects at Islamic Azad University of Bandar Abbas. The participants of the research are 60 students who have been chosen from among students studying different academic subjects. They have been divided into two groups: the first experimental group and the second experimental group. Measurement tools of this research include: a list of 15 items that includes 4 lists: needle, sleep, rough and soft which all of them have been taken from a questionnaire prepared by Roediger–McDermott. Each of the items of the list was recorded in an interval of 2 seconds on a tape. This research a 2×2 plan that uses two groups. To analyze the hypotheses of the research, MANOVA test was employed to compare the groups. The obtained results show that students' performance at deep processing level is significantly higher than student's performance at surface processing level in terms of recall and false memories.
KEYWORDS: Recall and False Memory, Undergraduate Student, Bandar Abbas

1. INTRODUCTION

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The process of recognition is related to some issues such as how people perceive, learn and think the information. A cognitive psychologist works on issues such as how people understand different topics; Why they remember some facts and forgot another ;How they learn a new language or how think to solve the problems; Why so many people remember the name of the specific experiences while they forget the name of people who know them years ago; Why are some people are panic when traveling by air but they have no fear traveling by car while the death rates due to road accidents is much higher than deaths caused by air accidents. Why do people feel fear in the face of some systems and what is the impact of the fear on expressing needs. These issues are the questions to be answered by the study of cognitive psychology [1].

Recognition is gain via the processing of information by the persons and this knowledge affects on the resulting data interpretation [2]. Therefore, effect of processing on factors such as false memory and recall is very important. This study has attempted to investigate the concepts related to the processing and recalling and false memory.

An important issue for cognitive theories is how well we remember things, because every aspect of cognition in some extent is dependent to the memory. To understand problem solving, decision making, attention and perception, the knowledge about abilities and limitations of the memory is required. Many of the events are dependent to viewer reports. From a witness testifying in a murder trial to a couple arguing about who said what, the memory and its validity is important. An interesting finding is that there is no way to estimate the accuracy of memory without eyewitness proof (such as a photograph or tape recordings). Personal confidence in recalling details are not a precise proof about the fact of a witness's memory, this does not mean that the most recollections and memories are inaccurate; however, in situations where accuracy of details is important, the memories cannot be trusted [3].

When the special events that have never occurred in reality recalled, false memory occurs. False memories are often harmless, but not always. For example, in the courts the proof of guilt or innocence of a person depends on a set of documents, including witness statements and on the assumption, what he remembers is correct. Studies have shown false memory has been involved in a lot of mistake convections [4].

To investigate false memory DRM paradigm commonly used. Participants are given a system of words (e.g., bed, rest, awake, dream) that are related to an index word (e.g., sleep). In the test is taken, participants often report index words even though it is not listed [5]. When one of those words that are not in sequence is reported a false memory is occurred. In some cases, individuals report that they clearly recall they have seen or heard that word and they have a very strong memory while this is not true [3].

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Recall is remember of information after the exposure and recognition them, detection and identification of previously encountered stimuli, from a variety of stimuli. Recall and recognition Memory is one of the essential elements of information processing systems and in the disruptions that information processing systems are disrupted, it is thought that these structures do not stay away from injuries [6].

Following the presentation of the various models and theories such as Warf and Norman pattern memory (first and secon memory), Etkinson and Shefrin pattern (short-term and long- term memory),Depth of processing paradigm Craik and Luckhurt, and despite the fact that depth theory or processing level theory are interesting alternative to the theory of dual memory, criticisms also came on these theory and models [2]. One of the major criticisms of the theory is negligence about the type of processing during study and test of materials [7]. Tulving found inclusive principal for the memory that such interactions were in the back. The fact that is known as the "encoding specificity "suggest that if sign in the test position have similarity with the coded signs of the position, the memory performance will be higher [8].

Much research has been done on each variable separately but in none of them the concepts of processing [8, 9, 10, 11], false memory and recall have not been studied at the same time that this issue shows the lack of study in this research field. Given the important role of false memory and recall issues in cognitive psychology, this study tries to answer this question whether the processing level has impact on false memory and recall of Bandar university students with different major?

2. MATERIALS AND METHODS

The study design is a 2 x 2 experimental design with two experimental groups, Group I and group II. In this scheme, an alternative approach of subjects in the experimental group is quite random. In this study, the dependent variables are recall and false memory that the impact of processing on them was investigated. For Sampling in this study, sixty of the volunteers enrolled in the study were randomly selected according to the following formula: 20 persons from each School (Schools of Science, Humanities and Engineering). Then 60 randomly selected persons were putted in group I and group II randomly. A list with 15 substances was used in this study included four issues: needles, sleeping, rough and soft that were taken from the questionnaire of Rüdiger and Mac Dermat. Any substance in this list was recorded on a tape with a 3 -second time interval.

To investigate the study hypothesis, MANCOVA test was used –it was used after making assumptions. Data were analyzed using SPSS 18 software.

3. RESULTS

The purpose of this study was to investigate the impact of processing levels on student recall and false memory. The findings of current study were presented in two sections of description and hypothesis. Table 1 shows mean, standard deviation, minimum and maximum scores for the variables of the study**.**

In the first group (surface processing), participants were told to count and write the number of vowels in each word (a specify number). For example, participants were given the word dog and they must write the number 1 because there is a vowel in the word. In the second group (deep processing level), participants were instructed to classify every given word as an objective / subjective one.

Table 1. Variables mean and standard deviation (recall and false memory) in recent study

Processing level	Variable	N	Mean	SD	Max.	Min.
Surface	recall	30	6.60	0.93	5	8
	False memory	30	1.33	0.88	0	3
Deep	recall	30	9.13	1.10	7	22
	False memory	30	4.63	1.09	2	7
Total	recall	60	7.86	1.63	5	11
	False memory	60	2.98	1.93	0	7

As can be seen from the above table in the surface processing level, the mean (and standard deviation) of variables for recall variable is equal to 6.60 (0.93) and for the false memory variable is equal to 1.33 (0.88). Also, in the level of deep processing, the mean (and standard deviation) of variables are 9.13 (1.10) and for false memory variable is equal to 4.63(1.0). In all cases, regardless of the level of the process, mean (and standard deviation) of variables for recall variable and the false memory variable is equal to 7.86 (1.63) and 2.98 (1.93), respectively.

As previously mentioned, the MANOVA test was used to compare the groups on the dependent variables of the study. Before running this test, the data were analyzed and there was no violation of the assumptions. Hypothesis of this paper discusses that the student performance on semantic processing compared with the

performance of students in the surface processing of recall and false memory is significantly higher. Analysis results are presented in Table 2.

Table 2. Summary of the results of multivariate analysis of variance on the dependent variables of study

Effect	Test	Value	F	Hypothesis df	Error, df	Sig.	Effect Size
Processing	Pillai's Trace	0.83	146.49	2	57	0.001	0.83
	Wilks' Lambda	0.16	146.49	2	57	0.001	0.83
	Hoteling's Trace	5.14	146.49	2	57	0.001	0.83
	Roy's Largest Root	5.14	146.49	2	57	0.001	0.83

Table 2 shows that, there is a significant difference between surface and deep levels of processing in recall and false memory. To further explore of this difference, one way analysis of variance in the dependent variables was performed by MANOVA. The results of this analysis are presented in Table 3. Table 3 shows ANOVA results for comparison of the scores of the dependent variables recall and false memory in the MANOVA text in various level of processing.

Table 3. Results of ANOVA on the scores of the dependent variables in the MANOVA

Effect	Dependent Variable	SS	DF	MS	F	Sig.	Effect Size
Processing	Recall	96.26	1	96.26	92.03	0.001	0.61
	False Memory	163.35	1	163.35	164.38	0.001	0.73

The results in the table above show one way analysis of variance in a variable recall (F=92.03, p= 0.001) are significant. To understand these differences it is enough to compare both deep and surface processing compared to the dependent variable. According to previous results (Table 1) average scores of the dependent variable in the study group, recalling in deep processing is significantly higher comparing with surface processing. There are significant differences between surface and deep levels of processing variables (false memory), to understand this differences we can compare the mean of two group with respect of dependent variable. According to previous results (Table 1) average scores of the dependent variable in the study of false memory in deep processing level is significantly higher than surface processing level. Therefore, the research hypothesis that predicts higher functionally in deep processing group in dependent variables is confirmed.

4. DISCUSSION AND CONCLUSION

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Results showed that there is significant difference between surface and deep levels of processing on the false memory and recall variables and the mean scores of the false memory and recall as dependent variables in the deep processing is significantly higher than surface processing. So we can say that the performance of deep processing group was significantly higher. The results of this study partly are consistent with results of Sarmadi et al. [12].

As well as Fattahi [13] in his review today, information is accepted as vital and strategic value of a commodity. Various activities are carried out on the data, including the process or processes which we call information processing. Resource development, technology, environmental information and so, and with growth of various systems and databases, processing is given more than any other time.

It is clear that educational programs in schools and universities and centers of higher education must be profitable and this obligation requires paying attention to the processing level in individual performance. As processing levels refers to mental activity of the memory, environmental factors is important for information processing. Daily emotions affect performance of many people and lead to false identification of the contents therefore in this point of view the effect of depth of the information processing is highlighted. In this regard, the results of this study showed that the deep processing (semantic) increases student performance.

It can be concluded that these results can be used for educational purposes because the ineffectiveness of the traditional direct teaching methods highlights the importance of new ways to remember and recalling content. The results of this study contribute to a slight increase in knowledge in this field and to some extent can provide the necessary insight into counselors and university students.

ACKNOWLEDGMENT

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