The effects of conflicting schemas on recall
Tolios Athanasiosa *

a American College of Greece, 6 Gravias Street, Aghia Paraskevi/Athens GR-15342, Greece

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Abstract
The present experiment hypothesized that: a) the conflict of schemas would be greater (means that recall would be decreased) as the participant activated together (through reading and listening) word lists from two different schemas, than when they activated word lists from only one schema, and b) that participant would show greater reconstruction phenomenon in the recall face when activated together (through reading and listening) word lists from two different schemas than when they activated word lists from one schema. In the present experiment 36 undergraduate students from the American College of Greece were randomly selected to participate. Their participation was voluntary. One third (n=12) read and listened school schema simultaneously, one third (n=12) read and listened supermarket schema simultaneously and one third (n=12) read school schema and listened supermarket schema simultaneously. Results showed that the conflict of schemas would be greater as the participant activated together word lists from two different schemas. In addition, opposing to the second part of original hypothesis, the participants wouldn’t show greater reconstruction phenomenon in the recall face when activated together word lists from two different schemas.

Keywords: Schema, conflict, recall, read, listen, reconstruction, error.

1. Introduction

Many opinions exist on how brain works, but the most fascinated is “Schema”. According to this point of view Schema is “mental representations of what we know and have come to expect about the world” (Bernstein, 2003).

I chose to study “Schema” and how it affects memory, because I believe that “Schema” can explain clearly how brain organizes memories. I searched for days topics about “Schema” and finally I found that although thousands of experiments dealt with “Schema” concept in general, however none dealt with “Schema Conflict”. In other words what will happen when two schemas will be activated the same time.

Mandler (1984) suggested that: “A schema is a mental model that made it easier for users to recall an item” (as cited in Golbeck, 2002).

Piaget dealt with schema concept too. He believed that as the child actively engages with the people and objects around her, she begins to form mental constructs (schemas) about what the world is like (Piaget, 1929).

Anderson and Pichert (1978), supported that when information is incongruous with a currently activated schema, but congruent with another schema the new schema is activated (Cognition, 2006; Hursen & Ozcinar; 2008).
Bransford’s and Johnson’s (1972) experiments showed that having the right schema during the encoding stage can be crucial to understanding and remembering details (Broccias, 2003).

Research on novice versus expert performance by Chi (1988) suggested that the nature of expertise is largely due to the possession of schemas that guide perception and problem-solving (Schema, 1989).

Furthermore Frederic Bartlett (1930) concluded that people may confidently remember details that did not actually occur because they are consistent with the schema, a phenomenon called reconstruction (Memory, 2007).

Today the most acceptable definition is that schema is “mental representations of what we know and have come to expect about the world”(Bernstein, 2003).

Finally, the present experiment hypothesized that: a) the conflict of schemas would be greater (means that recall would be decreased) as the participants activated together (through reading and listening) word lists from two different schemas, than when they activated word lists from one schema alone, and b) that the participants would show greater reconstruction phenomenon in the recall face when activated together (through reading and listening) word lists from two different schemas than when activated word lists from one schema.

2. Method

2.1. Participants

For this experiment 36 undergraduate students were randomly selected to participate from the American College of Greece where all attended, and their participation was voluntary.

2.2. Apparatus

The sounded words that the participant listened were taped through the computer program of Sony Erickson. As the acoustic lists of words were taped, each list was removed in the memory card of a K750i mobile phone.

2.3. Materials

The experiment consisted from two phases. In the first face of the experiment it was asked from the participants to listen and read carefully lists of words. Each list of words was related with one specific topic which was written in the upper section of the page. The first list of words was about super market items. That list consisted of twenty words. The design of the experiment was that half of the super market lists of words were presented in an acoustic way and half of them were presented in a written way.

The second list of words was about school items. That list consisted from twenty words. As previously, the design of the experiment was that half of the school list of words would be presented in an acoustic way and half of them would be presented in a written way. The participant wore earphones in order to listen to the acoustic list of words in each condition. The speaker said clearly in Greek language each word during any two seconds. The list of words that the participant expected to read in the beginning of the experiment was covered (they could see only the topic) in order to prevent participants to read the list without synchronously listen to the acoustic list of words. Each list of words consisted from words that were not typical for any of the schemas that the participants were tested.

The no typicality of words was achieved through a pilot study that the experimenter conducted in advance. Twelve (n=12) participants asked which word of the list of words were typical for a super market or for a school. None of these words were used.

Present experiment included three conditions. 1st Condition: Read 10 supermarket list of words and simultaneously they listen to 10 different supermarket list of words. 2nd Condition: Read 10 school lists of words and simultaneously they listen to 10 different school list of words. 3rd Condition: Read 10 school lists of words and simultaneously they listen to 10 super market school lists of words.

The second part of the experiment took place immediately after the participants completed the first part of the experiment, it was asked from them to recall and write in a piece of paper any word that they remembered from both the acoustic and the written lists of words.

Also as a reconstruction, the experimenter counted every word that wasn’t included in any word list (written or acoustic), and as an error, experimenter counted every word that was included in at least one of the word lists but the participant recalled it differently. Finally the experimenter didn’t count as errors or reconstruction the misspelled
words.

2.4. Design and procedure

The experimenter used a between subject design with one independent variable and three levels. Finally experiment’s running time was approximately 4 min. Moreover each participant was provided with a debriefing.

3. Results

Present experiment had one independent variable with three levels. The independent variable is the schema and the levels are: super market schema, school schema, and super market schema plus school schema.

An One-way Analysis of variance between design was conducted to indicate whether there was a difference in the mean between the difference levels of schema activation (school schema, supermarket schema, school and super market schema), and revealed no significant difference between $F (1,36) = 2.3$, $p>0.05$, (table1)

Regarding the first part of the hypothesis the evidence showed that as the school schema activated, participant remembered 39.5 of presented words ($M = 39.5$, $SD = 14.3$) than when super market schema activated 31.2 of presented words ($M = 31.2$, $SD = 13.3$) or school and super market schemas activated 29.1 of presented words ($M = 29.1$, $SD = 8.7$), (table2).

Concerning the second part of the hypothesis the evidence showed that when school schema activated, participants tended to reconstruct more ($M = 2.5$, $SD = 5$) words than when super market schema activated ($M = 0.8$, $SD = 1.9$) or when the school and super market schema were activated both ($M = 1.2$, $SD = 2.2$), (table3).

In addition as regard modalities an unexpected finding was revealed. Results showed that the participants remembered more words when they read ($M = 17$, $SD = 9.7$) the words than when they listened to them ($M = 16.2$, $SD = 7.7$) (table4).

4. Discussion

The results of the present experiment supported the first hypothesis. However the present experiment failed to support the second hypothesis.

The findings of the present experiment supported the basic definition of schema. As the participants in the present experiment read or listened to the lists of words their appropriate schema was activated.

In addition based on Piaget’s point of view, the participants in the present experiment couldn’t recall many words because the items that they accommodate in their super market or in their school schema, were different from the items that the experimenter used as test items in the word lists.

The results of Anderson and Pichert (1978) supported the results of the present experiment. As the participants listened and read word lists from the same schema at the time of encoding, at the time of recalling they could easily remember words that were related with the activated schema. But as the participants listened and read word lists from different schemas at the time of encoding and focused their attention in only one of the two schemas, the result would be failure to remember words of the unattended schema at the time of recalling.

Moreover Bransford and Johnson (1974) findings supported the procedure of the present experiment. Present experiment allowed the participants to see the topic of the words list that they tried to recall afterwards. Maybe if the participants in the present experiment weren’t allowed to see the title of the list of words that afterwards tried to recall the results could be different. The title of the list of words activated immediately their schemas and helped them in comprehension.

Furthermore regarding Chi (1988) beliefs, a weak point of the present experiment was that the experimenter didn’t ask the participants that participated in school and super market condition or on super market condition, if they performed the shopping from the super market. So depending of schema activation, the experimenter should ask participants if they perform a specific habit in order to examine if that participant lack or not an appropriate for the experiment schema.

The findings of the present experiment were opposite of the findings of Bartlett (1932). Bartlett found a great reconstruction phenomenon because he examined what his subjects remembered from the story that they read, months or even years later. The present experiment examined only during some seconds
after the presentation (acoustic way and written way) of words list (so the reconstruction phenomenon should be low). So it was more possible for the participants of the present experiment where, when asked how many words they remembered, to report more words (so lower reconstruction phenomenon) than if they were asked how many words they remembered in a larger amount of time.

In the case of a future replication of the present experiment, the experimenter should ask the participants, in school and supermarket condition or on supermarket condition, if they performed the shopping from the supermarket as noted. In addition experimenter should test what the participants remembered not only some seconds after the encoding stage, but after a larger amount of time (days, weeks, months).

The topic of schema and memory is so magnificent that will provoke new researchers to deal with it in the future, and we should be optimistic that one day we will know the exact relation between them.

Table 1. Mean’s Difference

<table>
<thead>
<tr>
<th>Source</th>
<th>df</th>
<th>F</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between Groups</td>
<td>2</td>
<td>2.3</td>
<td>0.05</td>
</tr>
</tbody>
</table>

Table 2. Schema Activation

<table>
<thead>
<tr>
<th>Groups</th>
<th>Mean</th>
<th>Standard Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>School</td>
<td>39.5</td>
<td>14.3</td>
</tr>
<tr>
<td>Super Market</td>
<td>31.2</td>
<td>13.3</td>
</tr>
<tr>
<td>School+SuperMarket</td>
<td>29.1</td>
<td>8.7</td>
</tr>
</tbody>
</table>

Table 3. Reconstruction

<table>
<thead>
<tr>
<th>Groups</th>
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<th>Standard Deviation</th>
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<tbody>
<tr>
<td>School</td>
<td>2.5</td>
<td>5</td>
</tr>
<tr>
<td>Super Market</td>
<td>1.2</td>
<td>2.2</td>
</tr>
<tr>
<td>School+SuperMarket</td>
<td>0.8</td>
<td>1.9</td>
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Table 4. Recall

<table>
<thead>
<tr>
<th>Modalities</th>
<th>Mean</th>
<th>Standard Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Read</td>
<td>17.0</td>
<td>9.7</td>
</tr>
<tr>
<td>Listen</td>
<td>16.2</td>
<td>7.7</td>
</tr>
</tbody>
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References