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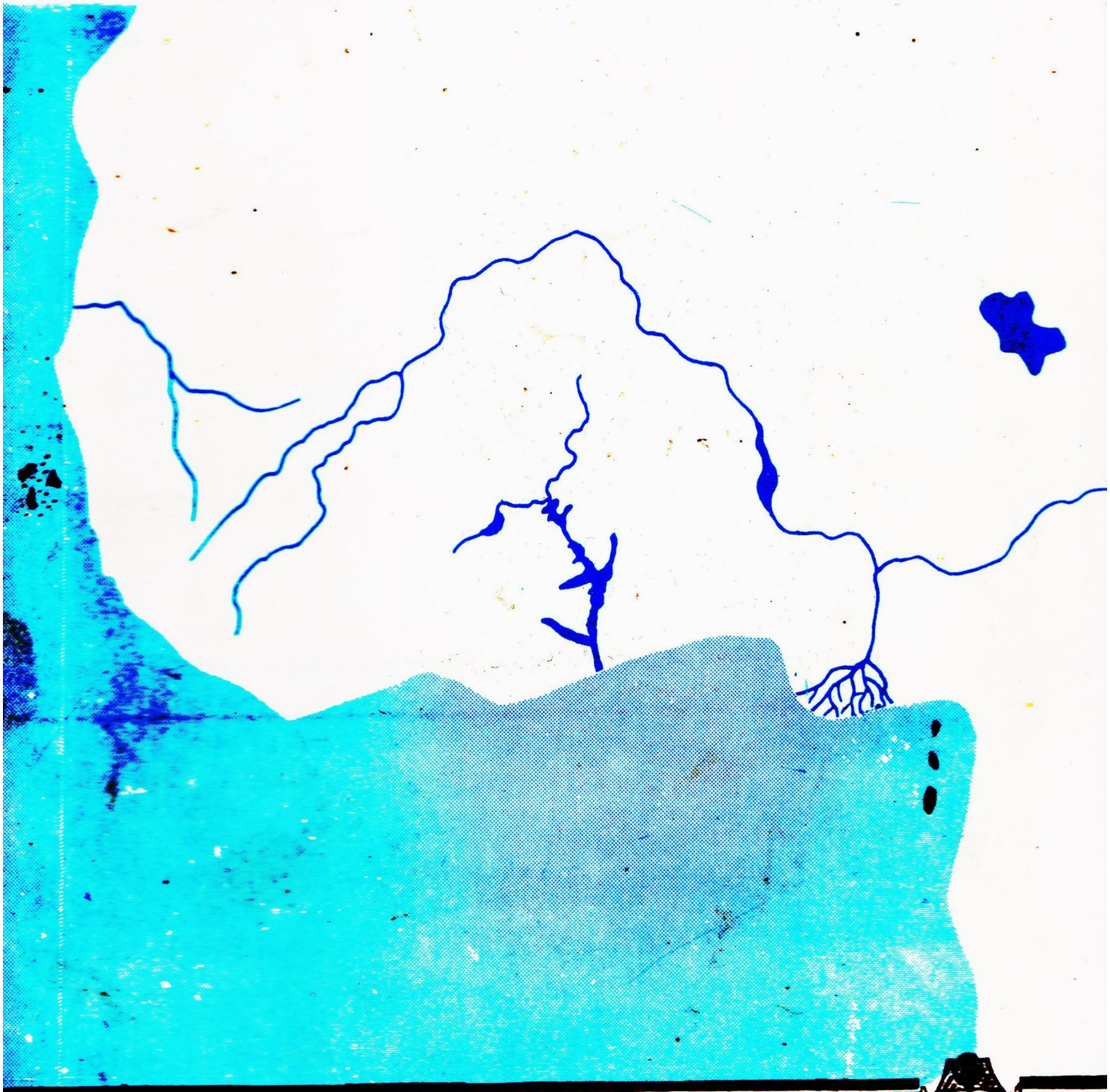

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RECALL AND RECONSTRUCTION OF PROSE AS A FUNCTION OF LINGUISTIC CONSTRAINTS

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ABSTRACT

An experimental study in a 4 x 3 factorial design was conducted to determine the effect of type of sentences (active-affirmative, active-negative, passive-affirmative and passive negative) and number of trials (2,5 and 10) on recall and reconstruction. In the framework of the study on memory with meaningful verbal materials in Bartlett's tradition, it is hypothesized that type of sentences used in passage and number of trials given in learning sessions would yield varying rates of recall and reconstruction (changes in form). Results confirmed that the hypothesis, F-ratio for type of sentences and number of trails were found to have significant main effects on correct recall as well as degree of change in form. Interaction for degree of change in form on recall was found to be significant.

INTRODUCTION

For some time now it has been repeatedly shown that grammatical forms, especially syntactic forms (surface structure) of a prose passage are more susceptible to forgetting than the thematic content (deep structure). It is argued that the deep structure of a prose passage is not only resistant to forgetting but also serves the purpose of mnemonic device in re-structuring the learnt material for recall (Anderson & Bower 1991, Ukpong 1999). In this connection convincing results have been brought forth to show that the surface structure of prose material does not remain intact in memory storage, and whatever is recalled contains different types of sentences in syntactic forms which differ from the original grammatical structure and syntactic forms. By way of interpretation, it has been suggested that subjects use certain kinds of knowledge about syntactic features of the prose material in its organization, Kintsh, Mandel & Komzinksky, (1977) have designated this knowledge as 'Story schema'.

Studies of the role of syntactic structure of prose in recall have shown that different linguistic structures of prose yield varying rates of recall and varying forms of reconstruction (Tripathi & Tripathi, 1980; Opoku 1983, 1985; Bassir 1991). In this context an important question is: Is recalled or reconstructed prose passage in any way systematic and predictable? In what ways does the syntactic and grammatical structure of a recalled passage differ from the original in its surface structure? It can be assumed that degree of reconstruction at the time of recall should be a joint function of the type of sentence structure, degree of original learning and retention interval.

There are a number of studies which lend support to this assumption. A considerable number of studies have been conducted to show the differential rates of recall as a function of sentence structures. Chomsky (1965) found that simple declarative sentences were closer to deep structure and hence required fewer transformations than negatives. Passive sentences have been the

object of considerable psychological interest (Koler & Gonzales, 1980). In a study Kulhavy & Heinen (1978) tested recognition memory for paraphrases in 40 under-graduates. Subjects learned a set of 8 sentences either in active or passive voice. Clear evidence was found that sentences in passive voice proved more difficult than sentences in active voice for recognition memory. Blake (1978), having 18 subjects in each group, compared 14 year old retardates, $9^1/_2$ year old normals, and 14 year old normals, for facility in dealing with positive and negative statements and tried to find out as to how the same is influenced by true value of the statement and the type of response to the task. Within all groups true affirmatives were easier than true negatives.

On the other hand, MacNamara & Kushir, (1971) found as would normally be expected, that increase in trials led to more resistance to subsequent interference. These two sets of studies lead to some interesting questions. Assuming that different types of sentences lead to different degree of recall and that the more exercise one had made at the time of learning, the more correct recall would occur, it becomes pertinent to ask as to what extent and in what manner recall of various types of sentences interact with the degree of learning. Along with this, another question can be raised. How does written and spoken language habits affect the language of recall? The present author in a frequency count of the types of sentences has found that active affirmative types of sentences are most frequently used and passive-negative types are least frequently used in French. On this basis it can be hypothesized that if the same prose piece is presented in active-affirmative, active-negative, passive affirmative, and passive-negative form and further similar amount of learning is allowed for each type, the degree of correct recall would be determined by the frequency with which various types of sentences are spoken in the subject's mother tongue. It can also be hypothesized that changes in the surface structure of the prose material at the time of recall would tend to occur in the direction of most frequent types of sentences occurring in the language, and will have inverse relationship with the degree of learning. The present experiment is designed to test these hypotheses.

METHOD

SAMPLE:

One hundred and twenty students studying in the French B. A. final classes of the University of Calabar, with ages ranging from 20 to 23 years, constituted the subjects for the experiment. Ten subjects were randomly assigned to each of the 12 *Stimulus Materials*.

Four passages in French language, each having 12 sentences were used. Each passage contained one of the four types of sentences. All passages delineated the same abstract thematic content regarding the present state of religion as it involves "sharia" in the country.

The sentences were so constructed that in each type of passage there were 12 sentences and all sentences were of the same type, and all passages carried the same meaning. Each sentence was typed on a strip of paper, and 12 typed strips of paper were used for each prose passage.

DESIGN:

This experiment was used in a 4 x 3 factorial design with 3 levels of sentence characteristics (types of sentences) –active-affirmative, active-negative, passive-affirmative, and

passive-negative and 3 levels (2,5 and 10) of reading trials.

PROCEDURE

Subjects used in each treatment combination were tested in group of 5. The group was tested in two sessions-presentation of the material, and its recall. The instructions provided for the subjects were as follow:

"I shall hand over to each one of you 12 stapled strips of paper. Each strip contains a sentence from a passage. I shall read the sentences one by one loudly at a fairly slow speed. Your task is to follow the sentences of the strips reading them from the strip. You are not allowed to read them loudly. Each strip should be turned over by you after you have read the sentence. Please listen and read the sentences carefully and try to memorize them. I shall read each sentence more than once so that you can memorize them properly".

The presentation mode of the material, thus, was both visual and auditory. Reading all the 12 sentences at a stretch was treated as one trial. Each required approximately 4 minutes. Sentence by sentence presentation was adopted with a view a view to controlling the effects of organization.

SCORING PROCEDURE

Two dependent measures were chosen for analysis of data. Data were scored both in terms of correct recall and changes in form. These sentences which neither changed in meaning nor in form were scored as correctly recalled sentences-each getting a score of one. But changes only in forms of the sentences and not in meaning were scored as sentences having changes in form and were given a score of one each.

RESULTS

CORRECTRECALL:

Table 1 shows the mean score of correctly recalled sentences. Recall was highest for active-affirmative sentences, followed by passive-affirmative, active-negative, and passive-negative sentences respectively with considerable gaps. The rate of correct recall was approximately similar for each type of sentence at earlier (2 and 5) trials numbers while at the latest trial number (19), the rate increased considerably. This becomes quite clear when the mean scores of correct recall are presented graphically (Fig. 1) The curves suggest that great exercise (number of trials) has yielded better recall, at least after 5 learning trails.

TABLE 1

MEAN SCORE OF CORRECT RECALL (TRAILWISE) FOR FOUR TYPES OF SENTENCES: ACTIVE-AFFIRMATIVE (AA), ACTIVE-NEGATIVE (AN), PASSIVE-AFFIRMATIVE (PA), AND PASSIVE-NEGATIVE (PN).

Trial No.	Types of Sentences			
	AA	AN	PA	PN
2	5.1	3.0	5.O	2.2
5	5.0	3.1	4.6	2.8
10	7.7	5.2	6.1	4.2

In order to test the statistical significance of the result apparent from Table 1 and figure 1 of the mean scores of correct recall, the data were subjected to two way analysis of variance. It was found that F-ratios of the type of sentences [F(3,108) = 47.81; p<.01] and number of trails [F(2.108) = 50.73;p<.01] were highly significant. It is interesting to note that no significant interaction even at .05 level occurred between the factors.

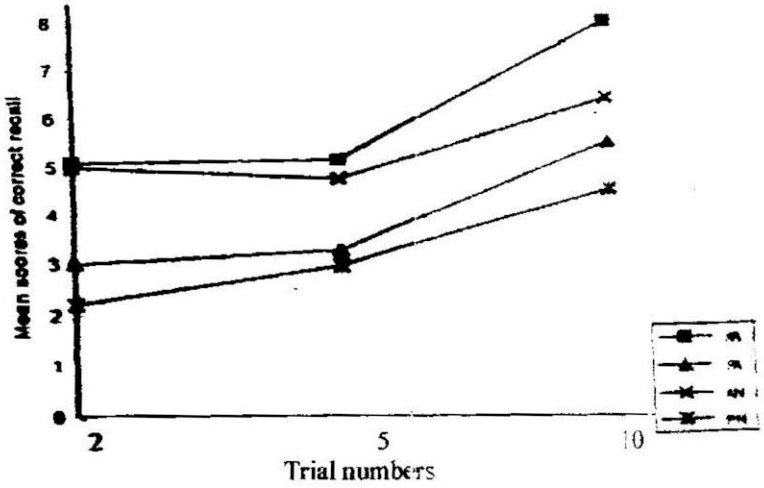

Fig. 1: ***Mean*** *scores of correct recall for four types of sentences*

Change in form

Table 2 shows the degree of change in form for the type of sentences that occurred as a function of number of trials. Fig 2. Shows that the highest degree of change occurs in recall to passive-affirmative followed by active-negative and active-affirmative at trial numbers (2 & 5). A considerable depression in the curves for these is shown at 5 trials but at 10 trials it again rises. It is interesting that changes in form occur at lowest but it is also maintained at even the greatest amount of trial (10). The pattern of the curve for passive-negative sentences is completely different from others. The highest degree of change occurred at 5 trials but at 2 and 10 trial numbers the amount of change that occurred next was passive-affirmative and active-negative sentences respectively. The curve interacts with the curves for passive-negative and active-negative sentences.

TABLE 2

MEAN SCORES OF CHANGES (TRIALWISE) IN FORM FOR FOUR TYPES OF SENTENCES – ACTIVE-AFFIRMATIVE (AA), ACTIVE-NEGATIVE (AN), PASSIVE-AFFIRMATIVE (PA), AND PASSIVE-NEGATIVE (PN)

Trial No.	Types of Sentences			
	AA	AN	PA	PN
2	0.4	1.1	2.7	1.7
5	0.1	0.3	1.1	2.2
10	1.4	0.6	1.4	0.5

Analysis of variance for changes in form reveals the fact that apart from main effects of type of sentences [F(3,108) = 13.51; p<.01)] and number of trials [F(2,108)=6.05; p < 05],interaction [F(6,108) = 3.59; p<.05] between the factors were also significant.

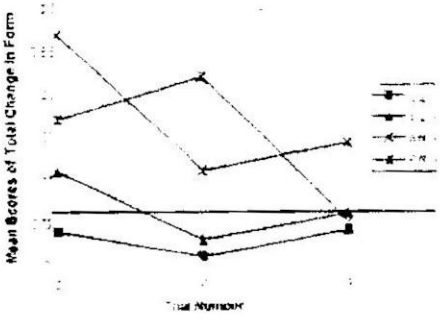

Fig. 2: Mean scores for total change in form for four types of sentences

Another important feature of the results regarding the changes in form is illustrated in Fig. 3 which shows the direction of change for each type of sentence at all the three trial numbers. It is apparent that there is no change from active to passive sentences, but the amount of change is highest from passive to active sentences, followed by negative to affirmative and affirmative to negative sentences respectively. It is interesting to note that when total change was scored the rate was found to be quite high at even the largest trial number (10). While analyzing the direction of changes in form for each type of sentence separately, the rate of change in every direction is lowest at the 10 trial number due to the distribution of amount of changes in different direction. But amount of change at 10 trials is considerable enough to suggest that amount of learning exerts least effect on changes in form of sentences.

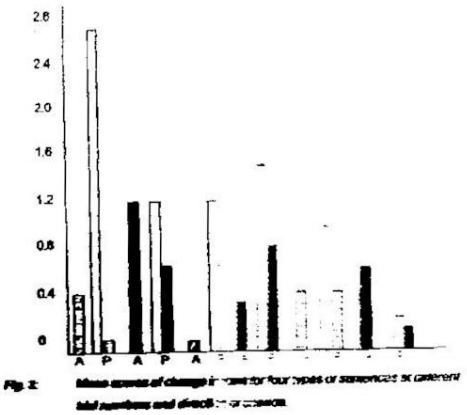

Fig. 3: Mean scores of change in recall for four types of sentences at different trial numbers and direction of change.

DISCUSSION

Results support the view that memory is not equal for different types of sentences and supports the view that the type of sentence is an important linguistic constraint which exerts considerable influence on retention of sentences. Though, in a particular society people interact with various kinds of sentences, while writing or speaking they tend to use certain types of sentences, according to their own frame of linguistic habits. Justifying the view of "story schema", results demonstrate that for active-affirmative sentences, subjects were least susceptible to forgetting contrary to the result found for passive-affirmative and passive-negative sentences which showed high susceptibility to forgetting. The findings throw light on an important aspect that even for the sentences as verbal material, considerable amount of forgetting occurs in immediate memory. As far as the amount of trials is concerned, findings suggest that memory increases as a function of the increase in trial number and, thus, support the findings obtained in the studies on immediate memory for nonsense materials in the tradition of Ebbingnaus. (1913).

Bartlett's (1932) notion that "remembering, was an imaginative reconstruction or construction.." is

supported by the results obtained for changes in form, and as the effects of number of trials is shown in results, it appears that 'imaginative reconstruction' occurs irrespective of amount of learning. However, it appears as though the reconstruction occurred, it occurred mostly in the linguistic frame of the meaningfully connected discourse. Central theme of a passage was sustained even after a considerable interval of time but the original syntactic form is often changed in a particular manner without a corresponding alternation in meaning, whether the retention interval was short or long. Reconstruction occurred due to the lack of objectivity in the use of linguistic form for a particular thematic content. No doubt people use a certain set of structures for sentences according to their linguistic habits. Types of sentences and number of trials (amount of learning) both influence the rate of change in form. The process of reconstruction was so influential that it occurs even in the condition of greater amount of learning can readily be concluded that reconstruction in form was an inevitable process in memory for prose with differential rate as a function of different types of sentences. Moreover results of interaction effect suggest that type of sentences and number of trails jointly influence the rate of change in form.

Analysis of the results of direction of change suggests that people are susceptible to change the form of sentences unequally in different directions. Results demonstrate that subjects were more susceptible to change from passive to active sentences, followed by negative to affirmative, and affirmative to negative sentences. But no change was found from active to passive sentences. It is quite possible that the story schema played a role in this result. It is clear that the sentences presented a negative theme, i.e., and negative statements about the malpractices in religion. Perhaps, this negative theme is responsible for raising the level of negative reconstruction. This speculation needs further experimental investigation.

It may be concluded that linguistic constraint (types of sentences) and number of trails (amount of learning) are influential factors for recall and reconstruction, whether the retention interval is short or long. The various aspects of the results about the effects of number of trials, the rate of immediate memory for sentences and the method of analysis (quantitative) of data itself appear to be important issues in linking Bartlett's (1932) tradition with the tradition of Ebbinghaus (1913) in the area of studies on memory.

Inspite of statistically significant results there are loose ends in the experiment which might need to be tied up. Despite significant differential effects of the amount of learning on change of form in reconstruction, it is undeniable that considerable change in form has occurred for the maximum learning trial group. Since no effort in this study has been aimed at assessing the degree of learning, no statement about complete learning to some criterion measure can be made and consequently it cannot be asserted that complete learning would have or would eliminate reconstruction almost completely. Had there been an attempt at establishing learning to a satisfactory criterion measure, then the obtained results could have been properly interpreted.

Another surprising aspect of the results is considerable change in sentences from affirmative to negative form on speculative basis. It can be

guessed that this could have occurred due to the negative nature of the theme of the passage. The theme centered around some negative aspects of current religious practices. Had there been a positive theme, perhaps, this tendency to change from affirmative to negative would not have occurred.

REFERENCES

Anderson, J. R & Bower, G. H (1991) On an association trace for sentence memory, ***Journal of verbal learning and verbal behaviour***, 10, 673-680.

Bertlett, F. C. (1932) ***Remembering: an experimental and social study.*** London, Cambridge University Press.

Bassir, I. (1991) Separation of Represental systems in the Bilingual: Three methods of assessment, ***Journal of Psychology in Africa. (South of the Sahara, the Carribean and Afro-Latin America)*** 1(4), 85-92

Blake, K. (1978). Affirmation and Negation in retarded and normal pupils dealing with binary statements. ***Journal of research development in education***, 9, 95-96.

Chomsky, N (1965). ***Aspects of the theory of syntac.*** Cambridge: NIT, press.

Ebbinghaus, H. (1913) ***Memory: A contribution to experimental psychology.*** New York Teachers College, Columbia University.

Kintsch, W., Mandel, T. S., & Kozminksky, E. (1977) Summarizing scrambled stories. ***Memory & cognition***, 5, 547 – 552.

Koler, P. A & Gonzales, E. (1980). Memory for words synonymns and translations. ***Journal of experimental psychology: human learning & memory, 6,*** 53-65.

Kulhavy, R. W., & Heinen, J. R. (1977) Recognition memory for paraphrases. ***Journal of general psychology***, 96, 223-230

MacNamara, J. & Kushir, S. L (1971) Linguistics Independence of Bilinguals: the input switch; ***Journal of verbal learning and verbal behaviour. 10***, 480 – 487.

Okpoku, J. Y. (1983) The learning of English as a second language. The development of the emergent bilingual represental system. ***International journal of psychology, 18,*** 271 – 283.

Opoku, J. Y. (1985) Bilingual representation systems in free recall. ***Psychological Reports, 57***, 847 – 855.

Tripathi, A. N& Tripathi, L. B. (1981). Recall of prose pieces as a function of syntactic constraint, theme imposition and instructional ***set. Psychologia, 24***, 97 – 104

Ukpong, E. M. (1999) The psychology of second language learning. ***International Journal of social science and public policy 2***, (2) 149-154