A COMPARATIVE STUDY OF SOCIALIZED AND TEACHER DIRECTED CLASS EXERCISES IN BEGINNING HIGH SCHOOL ALGEBRA

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By

R. D. HAMER

Bachelor of Science

East Central State Teachers College

Ada, Oklahoma

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APPROVED:

W. R. Chauncey
In Charge of Thesis

N. Cowger
Dean of the School of Education

D. G. McCulloch
Dean of the Graduate School

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CHAPTER I

INTRODUCTION

It is not the purpose of this work to laud or condemn any plan for socialization but to try to determine a method for socialization of ninth grade algebra and establish its validity in actual practice in the Yale schools.

Teaching as a science requires impartial and objective data secured under ordinary classroom conditions. Such data should be used as a basis for further experimentation and thus finally result in a finer and superior type of classroom instruction.

Care was exercised to see that the experimental group and the control group were as nearly equal in ability as possible; yet, at the same time, it is easy to see that there are factors which might enter in that are beyond control. It was one of these factors which led to the giving of the test on socio-economic status to determine to some extent if there were some differences due to social environment which otherwise might not have been discovered.

After a careful study of the problem of socialization it is the belief of many that all of the advantages of socialization cannot be measured by the mastery of the technique of algebra. If the student, through some of his experiences in this method, can learn cooperation

on a basis of a recognition of mutual interests, and develop some initiative and responsibility for his behavior as a member of a group, then the recitation has helped to some extent in making him better material for a good citizen. However, these values cannot be measured by any successful method other than through observation and an analysis of his future life.

Two subsequent problems have arisen out of the original which it might be well to mention in this work. One of these is the comparison of ability in algebra and the Intelligence Quotient, as determined by the Detroit Intelligence Test. The other is the ability in algebra as compared with the ability in arithmetic as determined by an arithmetic test compiled in the school in which this experiment was tried.

CHAPTER II

THE SOCIALIZED RECITATION

In recent years our population has increased very rapidly and our civilization has advanced to keep up with this growth in the population until today our daily activities are very intimately connected with the daily activities of those around us.

"Our forms of government, the structure and fabric of practically all our economic effort, the nature of the primary unit of society--the home, and to a very large extent our forms of leisure enjoyment are dependent upon an attitude of good will, a spirit of give and take, and cooperative effort and alternate leadership." [1]

It is necessary, therefore, that we try to avoid those things which will have a tendency to make of us individualistic characters and encourage those habits that will train us to a more cooperative mode of living. All of our high school courses of study and methods should be developed with the foregoing objectives constantly in mind.

Some educators believe that the traditional method of procedure fails to develop responsibility in the pupil for his conduct as a member of a class but teaches

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[1] Harl R. Doublass, Modern Methods in High School Teaching, p. 224.

him to regard the activities in which he engages merely as requirements. Because of the individualistic and authoritative methods used by the teacher in his instruction, actual social situations are not developed except in a very limited way. There is no common aim nor opportunity for the pupil to cooperate with his fellow class members. The student makes no pretense of contributing something to the group but addresses the teacher, only, in all of his recitations. A close observer of some of our traditional recitations might easily take one or the other of two views; the teacher is the one who profits from the recitation or he is paid to examine, not to teach, the pupils.

The result of such procedure is that the pupil sets up his goal to satisfy the demands of the teacher and his success is judged by this goal rather than by his progress in the subject studied. They go to class, take their seats, come to order, and wait until they are called upon. They usually entertain themselves by writing, reading or playing with something, and, when the class is dismissed, break into animated conversation about things which have significance for them, or about activities in which they have an actual part.

Mr. Charles L. Robbins in his book, "The Socialized Recitation" says, "Socialization means the creation and

the development of a feeling which binds members of a group in such a way as to make of them a unit." [2]

"Against this individualistic procedure the socialized recitation endeavors to organize the pupils into genuine social groups. Its purpose is to make the students feel that they constitute a society with common purposes and with working places of their own creation." [3] The aim is to socialize the class activity so as to reduce formality and make for naturalness, and shift the impelling drive from without the pupil to within him.

The movement for socialization has taken several forms, and has made its contribution in several directions. One has been the tendency to introduce a more socialized subject matter, i. e. a subject matter more intimately connected with the affairs of human life--economic, civic, social, hygenic, vocational and personal, and chosen on a basis of its value as training for life situations.

Another expression of socialization may be seen in the progress made in the field of extra-curricular activities. These activities include athletic games of all kinds, debating, scientific, commercial and scholastic clubs of all sorts, home room programs and student

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[2] Charles L. Robbins, The Socialized Recitation, p. 13.

[3] V. T. Thayer, Passing of the Recitation, p. 220

assemblies. When these are properly organized they are regarded as excellent training for progress toward the objectives of the school.

Still a third movement may be seen in the growing socialization of school control by the use of student councils and such other organizations used for student participation in school management. These organizations permit the pupils to participate in the management of the student activities and, to some degree, to control the general school morale and discipline as well.

In teaching methods, two important types have grown out of this socialization movement. One is called the socialized recitation and the other the project method. "Both are protests against the artificiality, the repression, the perfunctoriness, the listlessness, and the deadliness of the ordinary type of school recitation, and the lack of provision made therein for stimulating the initiative, the originality, and the self-expression of the pupils." [4]

The socialized recitation is not without its dangers, as is every other school room practice that is developed. It is very easy to become more interested in the organization than in the progress of the work

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[4] Harl R. Douglass, Modern Methods in High School Teaching, p. 250.

itself. "It would be a ridiculous gardener who became so interested in digging, raking, and fertilizing that he had no concern for what was planted in his garden."[5]

"Learning to cooperate with others of a small group, however valuable it may be, cannot compensate for a failure to gain the essentials of the content of the school work that is being undertaken."[6]

It is not the plan for the teacher, in order to make his work lighter, to substitute a student in his place. Nothing is to be gained through having the pupil, who is not trained, to conduct a formal recitation in the place of the teacher.

Care must also be exercised to curb the domineering pupil and prod the one who will shirk his individual responsibility. The teacher will find that to some extent those types will be cared for by the social pressure applied by the class, but he must not allow this to develop to the point that any pupil is ostracized.

There are two quite distinct types of socialized recitations. "One has been at different times called the formal, the institutional, the parliamentary, and

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[5] Charles L. Robbins, The Socialized Recitation, p. 62.

[6] Ibid.

the self-directing type; the other the informal, the discussion, or the seminar type."[7] The first is of the more striking type, the class being organized for work after some adult organization. The informal procedure involves no special organization. Many times the recitation simply comes to be more and more socialized until at length the old quiz recitation and the individualistic pupil-teacher relation have quite disappeared.

The extent to which either of these two types can be socialized, depends upon the subject to be taught and the many other conditions to be met. It is the plan of this work for the teacher to make all assignments and determine the work to be done by the class. The socialization is to be used for the purpose of conducting the study and drill of the work at hand, and to give the student some responsibility for his conduct as a member of a group.

Experimental Evidence

In the way of experimental evidence the result of two outstanding studies has been cited by Mr. Douglass. The first of these was one carried out by W. H. Johnson, in charge of technical research, at the Lane Technical

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[7] Harl R. Douglass, Modern Methods in High School Teaching, p. 250.

College. Its purpose was comparing the efficiency of the ordinary question and answer type of recitation with that of the socialized recitation.

The subject selected was mathematics. Four classes were included in the experiment which extended over a period of twenty weeks. They were two first year beginning classes and two second year beginning classes. One class of each group was used as an experimental class and the other a control class.

The Otis Self-Administering Tests of Mental Ability were given the four classes near the beginning of the semester. The two first year classes represented approximately the same degree of intelligence with similar dispersion of scores. In the case of the second year classes the median scores were the same with a greater dispersion of scores for the control group.

1. A statement of the project was secured from some member of the class.
2. Criticisms of a constructive nature were permitted.
3. After the pupil had carried on the discussion for a short time he selected a successor.
4. If time permitted the students were called upon to evaluate their classmates' answers and criticisms.

Three distinct advantages appeared in the socialized recitation.[8]

1. The pupils in the experimental groups were full of enthusiasm. Cheating and deliberately poor conduct were seldom discovered.
2. The experimental groups afforded the teacher many interesting situations. There were abundant opportunities to study the mental processes of the pupils. Besides training the pupils in new experiences and modes of expression, the teacher found it possible to aid the individual pupil in those processes which presented special difficulties.
3. The results of subject matter tests which were given at five week intervals indicated that the pupils in the experimental groups had grasped the subject matter better than the pupils in the control groups.
4. The dispersion of the scores was less in the case of the experimental groups.

The second study was reported by Maurice W. Taylor, Elementary School Principal, Sands Springs. Mr. Taylor

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[8] The School Review, Vol. 32, pp. 682-87.

used thirty lessons as a basis of his study. Eight of these were in the fifth grade and twenty-two in the sixth grade.

The lessons were made up of twelve lessons in geography, twelve lessons in history and six in physiology and hygiene. Informal subjects were chosen because they offered new and more or less independent facts.

Tests were given after the presentation of each lesson to ascertain the comparative results. Fifteen of these lessons were socialized and fifteen were teacher directed lessons. The tests were of the true and false type and were scored the rights minus the wrongs.

The total scores were 1231 to 1016 or a difference of 215 in favor of the socialized recitation. Ten of these lessons, five of each type, were reviewed, reversing the type of recitation for the review as was used for the original lesson. These review lessons were chosen at random and a test given at the close of each review using the same tests as were used for the original lesson. The results showed an advantage of 167 points in favor of the socialized recitation.

The principal conclusions reached by Mr. Taylor are:

1. Under the socialized plan interest and attention are the dominant factors.
2. The plan developes courtesy and observance of the rights of others.

CHAPTER III

THE EXPERIMENT

Yale

The community in which this plan was developed is a town located on the edge of the oil field in the north central part of the state. Yale has a population of 1750. It is the home of two refineries, only one of which is in operation, and one gasoline plant. Yale has municipally owned light, water and ice plants. A large part of the citizens is employed in the oil industry.

The city has five churches with three regularly employed ministers, two ward schools and one high school. The two ward schools have grades from one to six in each, and the high school has grades from seven to twelve. In the two ward schools there is an enrollment of about 350 students and ten teachers. The high school has an enrollment of 275 pupils and a staff of eight teachers including the superintendent and principal. Class periods in this school are 45 minutes each. Algebra is offered in the ninth year. At the beginning of the year there were 66 enrolled in the algebra class, 58 of whom completed the year at Yale.

How the Class Was Divided

The entire group was given the Detroit Intelligence test and an arithmetic test.[1] Each pupil's score on the arithmetic test and his intelligence quotient were combined in terms of sigma index and these were listed in order from the largest to the smallest. Each was then numbered from one to 66.

Pupils 1, 2, 3, 6, 10, 11, 12, 14, 19, 22, 23, 24, 26, 27, 30, 31, 34, 35, 38, 40, 43, 44, 47, 48, 51, 53, 55, 58, 59, 61, 63, 64, 66 were taken as the control group and the rest were taken as the experimental group.

Tables I, II, and III show the results of the tests for the two groups, with totals and averages. Table I shows the results of the intelligence test, Table II the results of the arithmetic test and Table III the average sums of the two tests. The results of these tests are shown translated into sigma index so that the scores on the two tests may be combined. It will be seen that scores are shown for only the twenty-nine of each group which finished the year at Yale. The withdrawal caused the two groups to be unbalanced in ability, the higher average being in favor of the experimental group, as shown by the tables. This condition will have to be taken into consideration in the interpretation of the results of the experiment.

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[1] Harry J. Baker, Detroit Intelligence Test. Arithmetic Test, (Prepared by the Instructor)

TABLE I
I. Q. AND THE CORRESPONDING SIGMA INDEX
OF EACH STUDENT

Experimental			Control		
Pupil	I. Q.	Sigma Index	Pupil	I. Q.	Sigma Index
4	116	1.268	2	121	1.620
5	111	.916	3	115	1.197
7	116	1.268	6	129	2.183
8	106	.564	10	110	.846
9	124	1.830	11	110	.846
13	113	.345	12	104	.423
15	111	.915	14	117	1.331
16	104	.423	19	109	.776
17	116	1.268	22	103	.346
18	101	.211	23	102	.282
21	102	.282	24	114	1.128
25	114	1.127	26	99	.070
28	109	.775	27	101	.211
29	94	- .282	30	104	.423
32	107	.633	31	101	.211
33	79	-1.330	35	94	- .282
36	87	- .775	38	95	- .210
37	83	-1.056	44	91	- .493
39	91	- .493	47	88	- .704
41	100	.141	48	90	- .563
42	100	.141	51	82	-1.127
49	96	- .141	53	91	- .493
50	99	.070	55	87	- .775
52	87	- .775	58	89	- .633
56	82	-1.127	59	88	- .704
57	92	- .423	61	74	-1.689
60	83	-1.056	63	83	-1.055
62	62	-2.535	64	80	-1.267
65	82	-1.127	66	56	-2.958
Total		1.057	Total		-1.060
Average		.0365	Average		- .0366

TABLE II

SCORES ON THE ARITHMETIC TEST AND THEIR CORRESPONDING SIGMA INDICES

Experimental			Control		
Pupil	Arith. Score	Sigma Index	Pupil	Arith. Score	Sigma Index
4	43	1.647	2	42	1.529
5	44	1.765	3	45	1.882
7	39	1.176	6	34	.588
8	43	1.647	10	38	1.059
9	43	1.647	11	38	1.059
13	40	1.294	12	40	1.294
15	32	.353	14	30	.118
16	36	.824	19	33	.471
17	30	.118	22	33	.471
18	37	.941	23	32	.353
21	34	.588	24	26	- .353
25	26	- .353	26	33	.471
28	27	- .235	27	31	.235
29	34	.588	30	29	.000
32	25	- .471	31	30	.118
33	38	1.059	35	30	.118
36	32	.353	38	27	- .235
37	33	.471	44	26	- .353
39	28	- .118	47	26	- .353
41	23	- .706	48	24	- .588
42	22	- .824	51	25	- .471
49	20	-1.059	53	20	-1.059
50	18	-1.294	55	21	- .941
52	22	- .824	58	16	-1.529
56	21	- .941	59	16	-1.529
57	16	-1.529	61	25	- .471
60	18	-1.294	63	15	-1.647
62	27	- .235	64	13	-1.882
65	18	-1.294	66	15	-1.641
Total		3.294	Total		-3.292
Average		.113	Average		- .113

TABLE III

AVERAGE SIGMA INDEX OF THE ARITHMETIC SIGMA AND I. Q. SIGMA OF EACH PUPIL

Experimental Pupil	Average Sigma	Control Pupil	Average Sigma
4	1.457	2	1.575
5	1.340	3	1.540
7	1.222	6	1.386
8	1.105	10	.952
9	1.739	11	.952
13	.820	12	.859
15	.634	14	.724
16	.623	19	.623
17	.693	22	.408
18	.576	23	.318
21	.435	24	.387
25	.387	26	.271
28	.270	27	.223
29	.153	30	.212
32	- .081	31	.164
33	- .136	35	.082
36	- .211	38	- .223
37	- .292	44	- .423
39	- .305	47	- .528
41	- .283	48	- .575
42	- .342	51	- .799
49	- .600	53	- .776
50	- .612	55	- .858
52	- .799	58	-1.081
56	-1.034	59	-1.116
57	- .976	61	-1.080
60	-1.175	63	-1.351
62	-1.385	64	-1.575
65	-1.210	66	-2.302
Total	2.175	Total	-2.175
Average	.075	Average	- .075

Comparison of the Socio-Economic Status of the Two Groups

Realizing that the environment of an individual may have some bearing on his work, a test to determine the Socio-Economic status of the two groups was given. The Sims Score Card for Socio-Economic status was used for this purpose.

The results together with averages are shown in Table IV. A study of these tables reveal very little difference between the averages for the two groups and this difference is so small that the average work done by the two groups would be affected very little.

The Organization of the Experimental Group

The experimental group met under the supervision of the instructor and after a discussion of some of the types of socialized recitations decided to divide itself into five groups each headed by a captain. It was agreed that the captains should be chosen on their ability as leaders as well as their abilities in mathematics. Accordingly five captains were elected by the class. These captains were given a roll of the class and permitted to meet and divide the class into five groups as nearly equal in size as possible.

Care was exercised in the division of the class and the conducting of the recitation to prevent any motivation of the work from rivalry between the two groups and thus detract from the validity of the experiment.

TABLE IV

SCORES OF THE TWO GROUPS ON THE SIMS SCORE CARD

Experimental Group		Control Group	
Student	Score on Sims Score Card	Student	Score on Sims Score Card
4	19	2	6
5	18	3	6
7	12	6	12
8	21	10	10
9	12	11	10
13	10	12	10
15	13	14	14
16	19	19	10
17	10	22	17
18	11	23	18
21	19	24	18
25	15	26	24
28	15	27	16
29	15	30	17
32	11	31	21
33	18	35	13
36	10	38	19
37	14	44	7
39	13	47	7
41	13	48	8
42	19	51	13
49	17	53	20
50	18	55	24
52	15	58	21
56	15	59	12
57	18	61	15
60	8	63	14
62	11	64	13
65	13	66	12
Total 29	422	Total 29	407
Average	14.55	Average	14.034

The Socialized Recitation

Assignments:

The assignments were made, as nearly as the work would permit, on Monday morning for the entire week. This was done by the teacher. Each unit was explained fully and the pupils were permitted to ask questions on each type of problem in order to make the explanation as clear as possible for the class. This usually took about the entire period on the first day of each week.

Study and Drill:

After assignments were made the class was allowed to divide itself into the assigned groups; each student going to the group to which he was assigned, for the purpose of study and drill. Each group worked on the units assigned, using the drill work in the text-book and supplementary drill from drill books and any other material brought to the class by the members of the group.

The Teacher:

The groups were permitted to work as they saw fit, using the teacher to explain difficult situations which no one in the group could solve and explain to the satisfaction of one or more of its members.

Talking was permitted as long as it was orderly and concerned the work at hand. The teacher, with the help of the captains, saw that visiting was kept at a minimum

and all boisterous conduct was quickly suppressed. This necessitated the calling of the entire class to task at times, but on the whole the instructor kept in the background, acting chiefly as a guiding force and a helpful member of all groups.

Responsibility was placed upon each member of a group for the progress his group made during the week. This seemed to have a tendency to make the individuals more interested in the work which his group accomplished.

Tests:

Each Friday a test was given the class over the work completed for that week with a small part of the last of the period being used as a critique and for ironing out the more difficult parts.

The Recitation for the Control Group

Drill:

The first part of the period each day was used for drill. Three methods were employed: (a) Blackboard drill, (b) Drill at seats, and (c) Work books. As nearly as possible the teacher supervised the entire group and corrected the mistakes of each individual during the drill period.

Assignments:

Assignments for the following day with explanations of the new topics to be studied were made following the drill period.

Supervised Study:

As nearly as possible a small part of the period each day was used for supervised study for the following days assignment. During this time the teacher tried to inspect the progress of each student and help those who were having difficulties.

Tests:

Each Friday the same test was given this group as was given the experimental group, and a short time given over to a critique of the week's work.

CHAPTER IV

RESULTS

Each group was given a comprehensive objective test for first year algebra[1] each six weeks. The score for each member of the class was changed into his sigma index. The sum of each student's sigma was divided by six, the number of tests, giving the student's average sigma index for the year.

The distribution of these scores as shown by Table V shows the Control group to have the wider dispersion. The dispersion of the Control group is 3.910 sigma while that of the experimental group is only 2.473 sigma. The dispersion of these same groups taken from Table III on the combined sigmas of the I. Q.'s and arithmetic scores shows that of the Control group to be 3.877 and that of the experimental group to be 3.124. This gives a difference in dispersion of the two groups in the first case above to be .753 and in the second case 1.437.

Table V shows the average sigma for the year of each student's six algebra tests and the average for the group. The average sigma index for the control group was -.112. The highest sigma for this group was 2.492 and the lowest was -1.418. The average for the experimental group was .112 with a high sigma of 1.599 and low of -.874.

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[1] Neva Carmon, Comprehensive Objective Tests in High School Subjects.

TABLE V

THE MEAN OF THE SIGMA INDEX OF SCORES ON THE SIX TESTS IN ALGEBRA

Experimental Group		Control Group	
Pupil	Sigma Index	Pupil	Sigma Index
4	1.599	2	2.492
5	.082	3	- .452
7	.269	6	- .536
8	- .064	10	1.043
9	1.353	11	1.138
13	- .092	12	.488
15	.019	14	.411
16	.135	19	- .022
17	1.254	22	-1.196
18	.022	23	- .696
21	1.131	24	.179
25	.365	26	- .374
28	.636	27	.554
29	.550	30	- .562
32	- .142	31	- .059
33	.249	35	- .677
36	- .478	38	.042
37	- .256	44	- .100
39	.302	47	- .392
41	.121	48	.225
42	- .716	51	- .645
49	- .092	53	.226
50	- .542	55	- .360
52	- .701	58	- .483
56	.700	59	- .328
57	- .851	61	- .097
60	- .080	63	- .809
62	- .651	64	-1.418
65	- .874	66	- .842
Total	3.247	Total	-3.250
Average	.112	Average	- .112

Making a fifteen step distribution, as found in Table VI, of the sigmas of the I. Q.'s, the Arithmetic sigmas and average Algebra sigmas and computing the medians, 10th, 25th, 75th, and 90th percentiles we find:

1. The 10th percentile of the Algebra sigmas is higher than the same percentiles of sigmas of the arithmetic scores and the I. Q.'s.

2. In all other cases we find the percentile points of the Algebra sigmas lower than those of the other two.

From this we would conclude that in general the percentile points in Algebra do not coincide with those of Intelligence and Arithmetic.

TABLE VI

DISTRIBUTION OF SIGMAS OF I. Q.'S, ARITHMETIC SIGMAS AND ALGEBRA SIGMAS SHOWING THE MEDIANS 10th, 25th, 75th, and 90th PERCENTILES

	I. Q.	Arithmetic	Algebra
-2.4 to 2.799	0	0	1
2.0 to 2.399	1	0	0
1.6 to 1.999	2	5	0
1.2 to 1.599	4	3	3
.8 to 1.199	7	6	3
.4 to .799	7	7	6
0 to .399	11	9	13
- .4 to - .001	4	8	14
- .8 to - .401	11	5	12
-1.2 to - .801	6	6	5
-1.6 to -1.201	2	6	1
-2.0 to -1.601	1	3	0
-2.4 to -2.001	0	0	0
-2.8 to -2.401	1	0	0
-3.2 to -2.801	1	0	0
Total	58	58	58
Median	.109	.044	- .086
10th Percentile	- 1.147	- 1.413	- .816
25th Percentile	- .673	- .833	- .517
75th Percentile	.771	.771	.354
90th Percentile	1.320	1.493	.960

CHAPTER V

CONCLUSION

The class was sectionized according to its Intelligence Quotients and its ability in arithmetic as shown by the tests given, the socialized group having a little the higher average which would make one believe that they would normally attain more.

The foregoing results show a slightly higher average for the group instructed by the socialized recitation method yet the difference is so small that it could not be relied upon as an authority for the change of all recitations to the social type. Yet it is proof that subjects can be taught as well by the socialized method as by the teacher-directed class.

It has already been stated that the dispersion of the control group was considerably larger than that of the social group which shows a tendency of the socialized recitation to encourage those pupils in the lower brackets to do better work and also the result of individual help which the teacher and other students can give under the socialized plan.

It is not the purpose of this study to condemn the socialized recitation nor to advocate it as a cure to all classroom troubles. There is much, in the opinion of the writer, to be gained from its use and the foregoing study will overrule much of the objection that the

method is impractical and produces inferior results. If we were to use the expression of the children themselves, they enjoy the work in a socialized recitation more than that of the traditional type. As this was their first experience in this type of recitation, whether it was just something new to grow old with use, is a matter of conjecture.

As for subject matter little depended upon the type of recitation. For another group or under different circumstances or instructor the results might be entirely different.

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Typist:
Mrs. Florence Lackey
824 Washington
Stillwater, Oklahoma