THE SCHOOL POSITION AND PROGRESS OF MINNESOTA CHILDREN.

A THESIS SUBMITTED TO THE FACULTY OF
THE GRADUATE SCHOOL
OF THE UNIVERSITY OF MINNESOTA
BY
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OUTLINE.

The School Position and Progress of Minnesota Children.

Introduction.

Recent investigations have been directed toward a study of the child relative to the school, and to learn to what extent the school is succeeding in carrying the pupil thru the elementary course. It has been found that many of the children do not finish this course and that many others are behind their fellow pupils or are retarded. The question has then been how to ascertain and judge the extent to which these conditions prevail. Various methods and means have been devised for this purpose.

Purpose of this thesis.

It is the purpose of this thesis to discuss these methods, and, to show their relative merits by applying them in a study of Minnesota school children.

Collection of data.

The Minnesota Psychological Conference, realizing the importance of a thoro study of retardation, set about gathering data bearing on this subject. A committee was

appointed in conjunction with the Superintendents' section of the M. E. A. to do this work. This committee with great care prepared a set of blanks, a copy of each of which is attached hereto, and in the spring of I9I2 these blanks were sent to all Superintendents of State High Schools in the state. Each Superintendent was asked to fill out the large blanks from records in his office, and to have each grade teacher under his supervision fill out one of the blanks of the "Progress and Age Study" for her room.

The schools of the state do not all use the same system of promotion. Some have yearly and others semi-yearly promotions. These schools are therefore not directly comparable with each other, and the reports from the schools having semi-yearly promotions have not been considered in this study. There remained then reports from 9I school systems which have been compiled. (Besides Minneapolis). These were divided into two groups, twenty-one towns having nine grade teachers or more, and seventy towns, having 8 grade teachers or less. These towns range in population, in the 70 towns from 400 to I800, and in

SPECIAL REPORT OF PUPILS BY GRADES

To SUPERINTENDENTS:

This blank was prepared by the special Committee on Retardation, appointed by the Minnesota Psychological Conference and the Department of Superintendence. At the annual meeting of these departments, April 1, 1911, it was voted that the Superintendent of Public Instruction should secure reports from all graded schools in Minnesota, in accordance with the blank prepared. Will you kindly, therefore, send me on or before June 20th, this report?

It should be noted that this report calls for first, the number of children in EACH GRADE by ages, in every building in your system of schools; second, a summary of certain facts relating to all pupils in the grades. I am sending a sufficient number of blanks to supply one to each principal. Kindly collect the reports from your principals and send to me all at one time on or before the above date.

The report calls for the number of children in each grade in each building that are five years of age, the number that are six years of age, seven years of age, eight years of age, etc., up to eighteen years of age and over. This report is intended to cover only the pupils in the elementary schools.

In reckoning age, consider a pupil five years old until he is six, and six until he is seven, and so on, and reckon uniformly from the age and birthday given by the pupil and placed in the register at the time he was enrolled.

Make the report include ALL pupils that have been enrolled during the school year whether they are in attendance at the close of the school year or not. The total of this item should agree with the total of item three in State Superintendent's Report.

The Department is desirous of having a full and accurate report. Please answer in full all the questions asked to the extreme right of the blank.

C. G. SCHULZ, State Superintendent.

School Public City

Date June 1 - 1912 Superintendent

GRADE		5	6	7	8	9	10	11	12	13	14	15	16	17	18 and over
Kg.	Boys														
	Girls														
I.	Boys														
	Girls														
II.	Boys														
	Girls														
III.	Boys														
	Girls														
IV.	Boys														
	Girls														
V.	Boys														
	Girls														
VI.	Boys														
	Girls														
VII.	Boys														
	Girls														
VIII.	Boys														
	Girls														

GRADE		Number in each grade who repeated the work of the grade.	Number promoted at end of this year.	Number who failed of promotion at end of this year.	Number in each grade who received special promotion within this year.	Number "demoted"—sent to a lower grade—within this year.	Number who left your school permanently within this year.	Number that left school permanently within this year who were known to stop school altogether.
Kg.	Boys							
"	Girls							
I.	Boys							
"	Girls							
II.	Boys							
"	Girls							
III.	Boys							
"	Girls							
IV.	Boys							
"	Girls							
V.	Boys							
"	Girls							
VI.	Boys							
"	Girls							
VII.	Boys							
"	Girls							
VIII.	Boys							
"	Girls							

PROGRESS AND AGE STUDY

INSTRUCTIONS TO THE PRINCIPAL: The object of this blank is to find out how long the children of each age have attended the elementary schools, disregarding the kindergarten. Eight blanks are sent to you, one for each grade in your building. Make a separate report for each of the eight grades. Consider the age as the age at the last birthday **before the time of enrollment at the beginning of this school year.** Count as a year's attendance any time *exceeding* one-half of any one school year, beginning with the child's first entrance into a first grade of any school, public or private and **including this school year.** Disregard any period less than one-half year. Begin with the children of the lowest age in grade, record the number of them that have attended for each given number of years, and so on for the children of each of the other age groups. The value of this report will depend upon the accuracy of the information secured by the room teacher. Each teacher should make careful inquiry of each child as to the number of years actually spent in the schools not counting the kindergarten.

Each City Superintendent will please summarize this study for each grade in his city and return his summary and all filled blanks to this office by June 20, 1912.

C. G. SCHULZ, State Superintendent.

City_____ School_____ Grade_____

Principal_____ Teacher_____

YEARS IN SCHOOL	AGES														TOTAL
	5	6	7	8	9	10	11	12	13	14	15	16	17	18 and over	
1															
2															
3															
4															
5															
6															
7															
8															
9															
10															
11															
12															
13															
TOTAL															

the 21 towns from 1400 to about 7000. The division was made largely to permit a comparison between the schools of the smaller with the schools of the larger towns. (A list of the towns is given in the Appendix).

Retardation.

One of the fundamental questions in any study of retardation is how to make the measurements. What shall be the basis upon which the child shall be rated as normal, or as above or below normal?

Two Methods in Vogue.

Two solutions have been offered, one the age-grade method, the other the progress method. The one takes the age-grade as its basis for the rating of the pupil, and ranks him according to some standard as to where he ought to be at any given age. The other rates the pupil on the progress he has made relative to the time he has been in school regardless of age.

Age-Grade Method.

The most commonly used method for measuring retardation is the age-grade method. It is easily understood, is simple in its application, and all the data necessary

are available. Every school keeps a record of the age and grade of each pupil. The retardation of the pupil is therefore usually based on these data, and the child is rated relative to a social standard indicative of where it is supposed he should be at any given age.

Leonard P. Ayres in his "Laggards in our Schools" gives a clear, concise explanation of the method. He says, "The methods for determining the number of retarded children in a given system which has received most general acceptance on the part of school men is the method which enumerates the children by ages and grades, and puts all of the children who are older than a determined age in each grade into a group designated. 'Above Normal Age.' These children who are older than they should be for the grade they are in our considered 'Retarded'. Thus the term designates a condition, and is applied with equal propriety to those children who are over age on account of slow progress and those who have progressed normally but have entered late."

Some difference of opinion exists as to the age limit which should be set for each grade. No absolute

rule can be formulated to govern this matter. It must of necessity remain to be settled by the conditions which prevail in each community. It would obviously be unfair to apply a standard of five years in the first grade, six in the second, etc., in a community where children usually begin school at the age of six or seven. This would show an amount of retardation which would not be at all true. In the same way Ayres' standard, six and seven years as normal in the first grade, would not measure the retardation in a school where the children usually enter at five. These children would be given the advantage of these years before they could be considered retarded, and the system would be ranked as especially effective while it might really be poor. Keeping this limitation in mind the age-grade method offers an excellent means for investigating the conditions of any school system.

Turning now to the study of our own schools, we have as illustrative of this method, a table showing the age-grade distribution for the group of twenty-one towns.

Table I.

Age-Grade Distribution of Grade Pupils.
For twenty-one towns having more than eight grade teachers and promoting annually.
(Each grade is reduced to a basis of I000 pupils so that percentages may be readily read from the table).

Grade	Age													No of Pupils
	5	6	7	8	9	I0	II	I2	I3	I4	I5	I6	I7	I8	
I.	85:	49I:	290:	I00:	2I:	I0:	I:	I:	:	I:	:	:	:		I659
II.	2:	92:	434:	269:	I34:	44:	I3:	I0:	I:	I:	:	:	:		I393
III.	:	I:	76:	369:	302:	I38:	59:	33:	I5:	6:	I:	I:	:	I	I428
IV.	:	2:	6:	66:	333:	296:	I49:	97:	3I:	I4:	3:	I:	I:	I	II69
V.	:	:	:	5:	76:	30I:	295:	I63:	89:	48:	2I:	2:	:		I247
VI.	:	:	:	:	3:	63:	266:	3I0:	I90:	98:	5I:	I7:	I:	I	II93
VII.	:	:	:	:	:	I0:	70:	272:	505:	207 :	93:	34:	6:	3	973
VIII.	:	:	:	:	:	I:	7:	56:	260:	3I6 :	2I4:	I02:	35:	9	I002

From this table we see at once the relative positions of the children. Without knowing anything further about the child we can say whether he probably is where he belongs or whether he is out of place.

Altho Minneapolis uses the semi-yearly system of promotions in her schools they have been used in this study of retardation. It is assumed that the "A" class of a grade in the spring are representative of the "B" classes of that grade in the fall. There may be changes within the class by new pupils coming in, but this will be counterbalanced by others dropping out or passing on more rapidly, so that on the average it is a fair assumption to make. The age-grade distribution of the "A" classes are therefore translated back to the previous fall, and in this way become directly comparable with the other two groups.

From such tables showing age-grade distribution for the two groups and for Minneapolis, we derive the following table.

Table II.

Position of pupils relative to a social standard of six years at entrance to the first grade, etc. (Reduced to I000).

No. of towns and Pupils	Under Age	At Age	Over Age	Under Age More	Under Age I	At Age: I	Over Age 2	Over Age 3	Over Age 4	Over Age 5	Over Age 6	More
(70) I4013	I03	356	54I	3	I00	356	286	I49	69	24	I0	2 I
(2I) I0064	78	355	567	4	74	355	296	I56	7I	30	II	2 I
Mpls. 6378	66	398	536	2	64	398	294	I52	60	2I	6	2 I

This table is based on a social standard of six years in the first grade. On this basis the amount of retardation ranges from 54 to 58 percent. Or a little over one half of the pupils in our schools are over age for their grade.

This is the basis which Supt. Lurton in an earlier study of the Minnesota Schools maintained as the standard for our State. His fifty-five schools are of the same

types as the two groups reported here, and are therefore directly comparable. He finds the percentage of retardation to be 59 percent, among I7279 children in these 55 schools as against 54 to 58 percent among 24077 children in the 9I towns. Only one reason is given for adopting the six year standard. The children are admitted into the schools at the age of six, and the state provides eight years of elementary schooling. It does not follow from this however that the children do enter at six. It is true that while we had the fourteen years compulsory school law there were small chances for a child to get thru the elementary course if he started later than at six years of age. It is moreover shown in another table that the average age for the first grade is seven years, and we are therefore hardly justified in applying the six year standard to these schools.

The law has now been changed, so that the pupil must remain in school until sixteen years of age, or until he has finished the grades. This means two more years of school life, and provides the opportunity for the late starter to get a full elementary education.

Ayres' Standard.

Men like Ayres, Thorndike and Strayer, who have made a special study of this question, have adopted the six and seven year standard because this comes nearest to meeting the conditions as they are generally found thruout the country. Ayres "Laggards," page 38.

" Now if the children enter the first grade at the age of from six to six and one-half years and are not retarded during the course, their ages in the several grades will be as follows:

Normal Ages of Children in the Grades.

Grade	Age.
First	6 to 8 years
Second	7 to 9 "
Third	8 to IO "
Fourth	9 to II "
Fifth	IO to I2 "
Sixth	II to I3 "
Seventh	I2 to I4 "
Eighth	I3 to I5 "

These ages have been accepted by common consent as the normal ages for these grades by nearly all the schoolmen who have interested themselves in the problem."

George D. Strayer, in his Monograph, "Age and Grade Census," issued by the U. S. Bureau of Education I9II, Bulletin No. 5, gives the same definition of the children "normal" for their grade. He calls attention to the fact that the standard may be too high, notably for New England, where the children enter school at five and six years of age. But taking the county as a whole it is considered the best that could be chosen.

If we now translate the percentages given in table two, as showing retardation on the six year standard, into a table based on the six and seven year standard, we get the following:

Table III.

	Under Age	At Age	Over Age.
70	I03	642	255
2I	78	65I	27I
Mpls.	66	692	242

The distribution of percentages will be the same as in table II, except that those shown as retarded one year in table II are added to the normal group.

Now instead of from 54 to 58 per cent of the children being found retarded only 24 to 27 percent appear as being above normal age.

This is somewhat better than the average thruout the country. Strayer, in his monograph, finds that the medium percent of average boys and girls respectively is 38 and 36. Ayres in his study of 31 cities finds an average 33.7 percent of the children above normal age.

It is not enough however, to make comparisons between different systems by giving the percentages of pupils retarded, even tho a certain age limit for the grades is used. The full age-grade distributions should be available in each case in order to permit the study of different systems from the same point of views.

It might be tempting for anyone connected with any school in question to try to make the percentage of retardation in that school as small as possible. This cannot be taken seriously however, as all schoolmen are

naturally interested in bringing to light the true conditions in their schools. One of the objections to the age-grade method, especially as applied by Ayres, is that it covers up a great deal of the actual retardation present in the system, because, while a child may have entered school at five or six years of age, the Ayres' standard does not consider him retarded until he is eight in the first grade or nine inthe second etc, and that the low percentage simply means the more extreme cases over-agedness. If this were true, the retardation of the Minnesota schools, as shown above, is not an exposition of the actual conditions to be found in our state.

On the other hand, if it can be shown that Ayres' standard corresponds with actual conditions, this objection is over-ruled so far as this state is concerned.

Table IV.

Grade	I	II	III	IV	V	VI	VII	VIII
Av. Age	7.0	8.2	9.4	I0.5	II.6:	I2.7:	I3.6	I5
Six year standard	6.5	7.5	8.5	9.5	I0.5	II.5	I2.5	I3.5
Ayres	7.5	8.5	9.5	I0.5	II.5	I2.5	I3.5	I4.5

This table is based on the age-grade distribution of the 2I towns, and shows the average age for each grade at the beginning of the year. The pupil is recorded as being 8 years when starting school in the fall. Now the pupils will range from 8 years one month to 8 years II months and yet be recorded as being 8 years old. The group however is on the average one-half year older than this. As many will on the average range above 8 years six months as from 8 years one month to 8 years 6 months. One-half year has therefore been added in each case to get the real average age of the group. The same has been done with the six year standard and Ayres standard. From this comparison it appears that while there is little choice between the two methods so far as the first grade is concerned, the one underestimating the average age by one-half year, the other over-estimating it by the same amount. From the second grade on, however, the six year standard makes a continually greater under-estimation and Ayres standard comes nearer to the average age of the group. From the fifth grade on the actual average exceeds Ayres standard, in the eighth grade by as much as one-half year.

This would seem to show that this standard comes very near to showing conditions as they are.

Many valuable contributions to the study of retardation have been made by Roland P. Falkner, both in critical comments on other studies, and in general discussions. "The Fundamental Expression of Retardation" in the Psychological Clinic, Vol. 4, is in the main an explanation of a short method for determining retardation. Attention is called to the heavy task involved in working out the tables necessary by the age-grade method. Therefore "if there is any short cut to the information sought, it may be worth while to point it out."

The grades usually show a small percentage of "below normal" pupils in the first grade, and an increasing amount up to the fifth or sixth grade, than a gradual falling off. Falkner questions whether the maximum percentage would not be a better measure of retardation than the average for the system. It would be futile however, to base this on any one grade. There is no law requiring a pupil to reach a certain grade before leaving school. The law requires the child to attend until he is fourteen years of

age (usually). The grade which he is a member of at that time will depend upon the time when he entered and the progress which he has made during his stay at school. Retardation begins with the eighth year, and from this time on the amount increases regularly until it will have reached its highest point at the age of thirteen years. This is the lat year which will generally hold all the pupils, hence this point "will measure the results of the work of the school system."

Table V.

	At Age	Over Age.				Total No.
		I	2	3	4 or more	
70 towns	67.2	20	8.9	2.5	I.4	I463
2I towns	58	24	I2	4	2	95I
Mpls.	66	I8	I2	3	I	700

Applying this method to our group of schools we find that 32.8, 42 and 34 percent of the thirteen year old group are below the seventh grade. This corresponds roughly with the percentages shown before on the standard of 7 years for the first grade. It is not claimed however, that this

method gives exact results, nor can it do more than to approximate the retardation in the school, since some of the I3 year old group may have passed on into the 8th grade and into the high school and are therefore not counted. In the absence of facilities for a more thoro study, however, the application of this method should give valuable suggestions bearing on the condition of a school.

It is not likely that this method will prove of any value to the study of our schools, however, as the new sixteen year old compulsory school law may change very decidedly the point of maximum retardation in the school system.

Progress Method.

We now come to the study of the progress method. Supt. J. M. Greenwood of Kansas City, discusses the method at some length in the Educ. Rev. Vol. 37, 342, I909, he says, "Retardation dealt with in this connection has simply to do with the pupils progress in his study as a pupil, after he is once installed as a pupil in school. It does not take into account his age, environ-

ment, and such other accidental qualities of his condition, except incidentally in stydying and in explaining his history as a member of the family or social group. If his parents deem it wise to keep him out of school until the compulsory law would force him into school, then the question of retardation or acceleration would begin soon thereafter to operate. But forcing a pupil into school as soon as a certain number of revolutions of the earth around the sun has been made is not a proper starting point for investigating whether a pupil is able to keep up with his classmates, or falls behind them. Retardation, except ina very remote way, is not one of years, months, and days, but one of educational velocity after one starts to school, and it should be estimated on his rate of speed than his studies."

Greenwood believes that any child should be rated purely on his ability to keep up with his grade regardless of age; that the only just and proper way to measure the application and ability of the child is to see whether or not he can keep pace with his fellows after he does start in.

This on the face of it looks right. It seems that a child should not be held to account for anything but that which he does. The opposition to this method, however, has been strong, mainly because the facts necessary for its application are not available in more than a few places, and it would therefore be necessary to wait at least eight years before any affective study could be made along this line.

The Psychological Clinic, Vol. 5, page 25I, contains an article by Norman Cameron, entitled "A new method for determining rate of progress in a small school system." In this article the author reports the results of an intensive study of a small school (Elkton, Md).

It is a valuable contribution to the literature bearing on this subject, but it can hardly lay claim to as many new features as the author enumerates. It is largely an amplification of the progress method. His method for determining the efficiency of a school system, however, is new, and merits consideration (Page 285).

In making this study he chooses the progress method, "principally because it shows the actual condition of

retardation." Some little effort is made to show why terms like normal progress, minus progress, and plus progress should be used in speaking of the different conditions found in a school. But there seems to be nongood reason why we should adopt his suggestions, at least while we are still in the beginning stage of this study. It would only serve to complicate a study which is difficult enough as it is. Whether or not this study is taken as a model, it shows however what can be done along this line, the one difficulty, as he states himself, being that it would be impracticable to study a large system in this way.

The reports from the "Progress and Age Study" are liable to errors on the part of the children, because it was necessary, in the absence of records bearing on this point, to rely on the memory of the different pupils. Great care was taken, however, and often the teachers would be able to assist materially from their own knowledge im making out these reports, and it is therefore safe to say that they are fairly reliable.

Table VI.

Progress relative to a standard of one grade per year.

				Fast					Fast.	
Towns:	Fast:	Reg:	Slow:	3-5:	2:	I:	Reg:	I:	2:	3: 4-6
(70)	87:	579:	334:	I	II:	75:	579:	262:	56:	I3: 2
(2I)	72:	623:	305:	2	9:	6I:	623:	237:	53:	I2: 3
Mpls	I28:	583:	289:	2	I8:	I08:	583:	228:	53:	6: 2

The above table shows in a condensed form the progress made by the pupils of the three groups. The showing made there is remarkably good. The percentages show that the social standard of one grade per year comes quite near to measuring the abilities of the children in general.

Less than one-third of all the pupils have made slower progress than one grade per year, the percentages ranging from 29 to 33.4. And from 58 to 62 percent have made regular progress during their stay at school. Of the pupils making slow progress the greatest number have lost only one year, only seven per cent having lost more than one year. In the same manner most of the pupils making more than regular progress have gained only one year, a

little over one percentage only, Minneapolis two percent, having gained more than one year.

In any study of retardation the main thing is to find solutions to the many questioned involved. Comparaing these percentages with those shown in an earlier section using Ayres Standard, we find a remarkable similarity. There is an underestimation in the latter of only about 5 to 6 percent, which is too small a difference to affect one's judgment about the size of the problem.

The progress method is based on the pupil's rate of speed after he begins school. We have already found that Ayres standard approximates very nearly the actual averages in years for the different grades. When we then keep in mind that both methods allow one year per grade in passing thru the course we have the explanation for the similarity in results which are obtained.

The six year standard almost doubles the percent of retarded pupils. The reason for this is clear. This standard assumes that the pupils should or do enter first grade at six, and therefore places a great many pupils in the "retarded" group who do not belong there.

We might consider at this time the question of the effect of late entrance upon the pupil's subsequent rate of progress.

Greenwood believes that pupils who begin late will pass thru the grades faster because of their more mature mental development and that they will soon catch up with their fellow pupils. A study of our own schools fails to bring any evidence to corroborate this belief.

Table VII.

Grades reached by those in school 5 years. 21 towns.

Age at entrance	Av. grade reached	I	II	III	IV	V	VI	VII
6	4.7		4	32	117	309	27	6
7	4.8		2	27	77	203	40	9
8	4.9		2	10	39	81	31	6
9	4.9			5	12	35	6	5
10	4.8		1	1	6	10	1	2

Table 7 shows that in the course of five years at school there is a slight increase in the progress of pupils who enter at eight or nine over those who enter at six or seven, but the increase is too small to be at

all significant.

L. P. Ayres in a study on "Entering age and subsequent progress," in Educ. for Feb. I9I2, gives several tables showing the relation between the age of entrance to school and the time which it takes to finish the grades.

"Age at Entering and Time to Complete Eight Grades of III85 children in New York City -- I909."

Age at entering.	Number	Median No. of yrs. to complete eight grades.
5	I52I	8.2
6	5828	8.I
7	2936	8.0
8	72I	7.9
9	I42	7.4
I0	26	6.9
II	9	6.6
I2	2	6.3

In several instances, as shown in the above table, considerable gain is made, but not once does the late starter regain the time lost.

It is not only that no appreciable gain is made by those who enter late, they create an anomalous condition in our schools which is one of the serious handicaps which confronts the teacher. The grades are made up not only by those who begin their school life at six or seven years of age, but also of pupils who began at eight or nine years of age or even later. When we add to these all the pupils who fail to go on with their class we get a condition which Supt. Greenwood aptly terms "the spreading of the ages."

Aside from all other reasons, it is just from our economic point of view that the child shall start in at an early age. The social standard of our day recognizes that a certain amount of work should be accomplished in a given length of time, and since society pays for the education of all its members, it is of interest that this is accomplished at the proper time and without loss.

Now it goes without saying that a child who enters first grade at the age of six or seven and makes regular progress, will be farther advanced from any economic point

of view at the end of a certain length of time than another child who enters at the age of eight or nine and makes regular progress than thru the same length of time. The first will be able to take his place in the ranks of the producers at least one year earlier than the other, and society will be the gainer by that much.

Elimination.

All measurements are made for the purpose of ascertaining how many of the pupils entering school are carried on thru the grades. We have discussed the methods for measuring their rate of progress thru the grade. We shall now consider the second problem in this study, namely elimination.

Elimination is the dropping out from school life of pupils, whether this be because of being over-aged for their grade because of slow mentality or because of late entrance or otherwise. They gradually come to find themselves classed with pupils much younger than they are, lose interest in their work and their surroundings, and drop out as soon as opportunity offers. In Minnesota they cannot

legally leave until 16 unless they have finished the 8th grade.

It is clear that the efficiency of a school system cannot be judged from the amount of retardation shown, alone, especially in the higher grades. The pupils who find themselves too much out of place will leave school as soon as they can and those who are left have already become more or less of a select group.

We therefore have the problem of measuring elimination. It is necessary to know how many pupils actually begin school every year in order to determine how many should be carried on thru the grades. Records showing this fact are almost never available, and it has therefore been necessary to estimate in some way the number of beginners.

Thorndike, Ayres, and Strayer have each devised a method for calculating the number. Thorndike takes the average of the first three grades together with certain minor corrections, and considers this as the number of beginners.

Ayres is explaining his method for calculating this

number makes clear why he does not use the grade population. The first grade is made up not only of the pupils coming to school for the first time but also of a number who have failed to pass on with their class, hence grade population is not at all indicative of the number who come for the first time. Thru extensive study he has come to the conclusion that the answer must be sought in the age groups in the school. He finds in giving the age distribution of a school system, great similarity between the age groups seven to twelve inclusive. Ayres therefore reasons that altho the number of pupils entering school varies, this number will on the average correspond to the number of children who become of school age each year. Therefore he takes the average of the ages seven to twelve to be approximately the number of beginners.

Reasoning along somewhat the same lines, Strayer comes to the conclusion that "the generation of children entering school in anyone year is best represented by the largest age group, which is precisely a generation of children, and since it is the largest it probably approximates more closely than any other that generation which has entered

the schools during the current year."

Table VIII.

Elimination - Number in each grade relative to the number entering school in one year.

70 Towns

Grade		I	II	III.	IV	V	VI	VII	VIII
No of pupils in the grades		2I24	I825	I7I6	I652	I645	I627	I598	I826
Actual No.of beginners	(I634)	I.30	I.I2	I.05	I.0I	I.0I	I.00	.98	I.I2
Thorndike	(I888)	I.I2	.97	.9I	.87	.87	.86	.85	.97
Ayres	(I469)	I.44	I.24	I.I7	I.I2	I.I2	I.II	I.09	I.24
Strayer	((I5I5)	I.40	I.20	I.I3	I.09	I.09	I.07	I/05	I.20

2I Towns.

No of pupils in the grades		I659	I393	I428	II69	I247	II93	973	I002
Actual No.of beginners	(I420)	I.I7	I.00	I.00	.82	.88	.84	.70	.7I
Thorndike	(I493)	I.II	.93	.96	.78	.84	.80	.65	.67
Ayres	(III4)	I.49	I.25	I.28	I.05	I.I2	I.07	.87	.90
Strayer	(I202)	I.38	I.I6	I.I8	.97	I.04	.99	.8I	.83

In the above table each of the methods is applied together with the actual number of beginners and each

number of beginners is used in determining the percent of pupils remaining thru the different grades.

The general objection to Thorndike's method, that his number of beginners is always to large, is borne out by the estimate which we get. The estimate number is I888 and I493 as against I634 and I420, the actual number of beginners. It is clear therefore, that the percentages for the different grades will be too small, as is shown by the table.

In like manner Ayres' and Strayer's methods prove to give too small a number, and the corresponding percentages are therefore much too high. Of these two, the largest age group approximates the actual number more closely. The following table shows at a glance how they compare.

70 --- I634 Str., I515 -- Ay. I469 -- Th. I888.

2I --- I420 Th. I493 -- Str.I202 -- Ay. III4.

In the 70 towns Strayer makes the nearest estimate to the actual number of beginners, then Ayres, and lastly Thorndike. While in the next group Thorndike's estimate is almost correct. No good explanation can be offered for this. It may be that the smaller towns hold their

pupils longer in the lower grades than do the 2I schools. The first three grades will therefore have a great many retarded pupils, and the average of these grades will therefore not represent the number of beginners. Another explanation might be a more rapid growth of the smaller towns. Neither of these, however, is offered as a full explanation, as no study has been made of the matter.

It is apparent from this that too many varying conditions effect the age-grade distribution in any school to warrant defendence on anyone of those methods, in determining elimination from school. Their chief value will be in ~~reaching~~ making comparative studies on a larger scale, where actual records are not available.

From a consideration of the actual number of beginners in these two groups of schools it will be seen that elimination in the smaller towns is not a very serious matter. These schools seem to hold most of their pupils thru the elementary course. In the larger towns, however, elimination seems to begin about the fourth grade, and a little more than one fourth of the pupils are lost before the end of the eighth grade.

SUMMARY.

The two methos which have been most commonly used in ascertaining and judging the retardation of a child relative to the school system are the age-grade method and the progress method.

The methods interpret the relationship from different points of view. The age-grade method recognizes a standard which expects that the child shall go to school at a certain age, and put all who are above this age for the different grades in one group and calls them retarded, regardless of whether they are there because of late entrance or because of slow progress. The progress method uses a standard of progression of one grade per year, but allows for the child entering school at any time, and does not regard a pupil retarded so long as he keeps up with this standard, no matter what his age may be.

In using the age-grade method it is necessary to determine what shall be understood by "normal age" for the different grades. Some maintain that a six year standard, for the first grade should be used while others with

Ayres, use a standard of six and seven in the first grade. The progress method and age-grade method, using the six and seven year standard, show approximately the same amount of retardation in the Minnesota schools. We have found Table IV page I2 that Ayres' standard comes quite near to estimating the average age for the different grades, and we are therefore justified in maintaining the reasonable efficacy ofthis method for determining retardation.

No community should expect to measure retardation by a standard which its average children cannot attain. Since the table above referred to shows that the average child does not quite conform to a standard of six years in the first grade it follows that this standard is slightly to high for Minnesota schools, especially in the upper grades.

Falkner's method is based on the theory that the maximum retardation shows what is being done at school better than the average retardation for the whole system. The I3 year old group is generally the last where practically all of the pupils are in school. It is therefore possible to estimate the amount of retardation in the

system by showing how this group is distributed thru the grades. The percentages obtained in this way in the groups of different sized towns is 32.8, 42 and 34. The I3 year old group gives percentages somewhat higher than those given by Ayres' method and the progress method.

The change in our compulsory school law which requires children in Minnesota to remain in school until they have graduated from the 8th grade or are I6 years of age, will undoubtedly make it advisible to use I4 or I5 years instead of I3 years, if this method is employed in our state.

The application of the progress method in our study reveals the fact that about one-third of the pupils fail to come up to the standard requirements of our schools. It would seem to be a question whether a readjustment of the scholastic requirements could be affected so that a larger percent of the children would be included in the normal group than is now the case.

Elimination does not play as important a part in our schools as it does in a great many others. The small schools especially hold most of their pupils thru the

grades. In the larger towns a little more than one-fourth of the pupils are eliminated before the end of the eighth grade. Even with this small percentage however, it calls for serious thought on the part of those to whom are entrusted the administration of our schools.

APPENDIX.

(From Educational Directory of Minn. 1911-12).

List of 21 towns.

Name	No of teachers in the Grades.
Akeley	12
Alexander	15
Anoka	19
Breckenridge	11
Case Lake	10
Chisholm	40
East Grand Forks	19
Fairmont	19
Frazee	12
Granite Falls	10
Hutchinson	15
Litchfield	12
Moorhead	17
Morris	10
New Ulm	16
Northfield	16
Sandstone	17
Wells	13
Willmar	20
Windom	12
Worthington	16

List of 70 towns.

Name	No of teachers in the grades.
Annandale	5
Barnesville	7
Belle Plaine	5
Bird Island	5
Blooming Prairie	7
Buffalo	8
Caledonia	6
Canby	8
Cannon Falls	8
Chatfield	8
Cokato	5
Cottonwood	5
Dawson	8
Delano	5
Eagle Bend	5
Elk River	6
Elmore	6
Fairfax	6
Fertile	4
Fosston	7
Fulda	6
Gaylord	5
Glencoe	8
Grand Meadow	5
Harmony	7
Hector	7
Herman	5
Heron Lake	6
Houston	5
Howard Lake	5
Jordon	5
Kasota	5
Kasson	7
Kenyon	8
Lakefield	8

Name.	No of teachers in the grades.
Lake Park	5
Lamberton	6
Lanesboro	8
Le Roy	6
Le Seur	6
Le Seur Center	6
McIntosh	5
Mabel	5
Madelia	8
Mantorville	5
Morton	6
New Prague	8
Olivia	7
Osakis	7
Paynesville	6
Perham	6
Pine City	7
Pine Island	7
Plainview	8
Preston	7
Royalton	6
Rush City	6
Rushford	6
St. Charles	7
Sauk Rapids	8
Slayton	8
Springfield	8
Spring Grove	5
Tyler	5
Wayzata	5
Welcome	5
West Concord	5
Wheaton	8
Winnebago	8
Zumbrota	8

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