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ABSTRACT

This report is a companion analysis to the Statewide educational needs assessment (EA 005 415). The companion analysis is not a completed study, but rather a feasibility study that asks some questions of some data as a heuristic device delimiting some parameters for further efforts within the Wisconsin State Department of Education. The data analysis model explicit in this companion analysis is that of asking questions of data -- a process through which management can be improved within existing data gathering and fiscal constraints. Only certain questions have been asked in this study because (1) it is intended as a companion analysis, (2) it is intended as a beginning, and (3) the information currently available is limited especially in terms of educational outputs. (Author)

Part II: Objective Data

Wisconsin Educational Needs Assessment Study

WISCONSIN DEPARTMENT OF PUBLIC INSTRUCTION / WILLIAM C. KAHL / SUPERINTENDENT

WISCONSIN

EDUCATIONAL NEEDS ASSESSMENT

COMPANION ANALYSIS

Wisconsin
Department of Public Instruction

Center for Research and Program Development
Evaluation Unit

[1969]

Introduction

This report is a companion analysis to the statewide educational needs assessment conducted for the department under the aegis of Title III, ESEA. The companion analysis is not a study completed, rather it is a feasibility study which asks some questions of some data as a heuristic device delimiting some parameters for future efforts within the department. The data analysis model explicit in this companion analysis is that of asking questions of data--a process through which management can be improved within existing data-gathering and fiscal constraints.

The process of asking questions can be a Department of Public Instruction effort leading to a priority ranking of educational needs in the state. The data sources tapped for answers to these questions can be continually updated to make them viable tools. Only certain questions have been asked in this study because: 1) it is intended as a companion analysis, 2) it is intended as a beginning, and 3) the information currently available is limited especially in terms of educational outputs.

HANDICAPPED CHILDREN

Based upon: 1966 Census of Bureau for Handicapped Children of the Wisconsin Department of Public Instruction surveying a random sample of parents in Madison.

Questions Asked of the Data:

1. How appropriate is the allocation of medical resources for identified need?

   To answer this question we put two tables of the study together and computed a rank order correlation coefficient.

Handicap	% Children With Handicap	% in Each Category Receiving Medical Care
Mental Retardation	35	41
Speech	22	11
Hearing	8	52
Vision	8	50
Emotionally Disturbed	5	43
Cerebral Palsy	4	85
Brain Damage	4	62
Motor Skills	3	70
Heart Condition	2	100
Miscellaneous	6	58
Not Ascertained	3	

Figure 1. Children with handicaps and receiving care as reported in Madison, Wisconsin, in 1966.

Handicap	Need Ranking	Medical Resource Allocation Ranking
Mental Retardation	1	9
Speech	2	10
Hearing	3	6
Vision	4	7
Emotionally Disturbed	5	8
Cerebral Palsy	6	2
Brain Damage	7	4
Motor Skills	8	3
Heart Condition	9	1
Miscellaneous*	10	5

*For example, epilepsy, leukemia, asthma.

Figure 2. Rank ordering of needs and resource allocation for handicapped children.

RANK ORDER CORRELATION COEFFICIENT

$$p = 1 - \frac{6 \sum_{i=1} d_i^2}{N^3 - N}$$

$$p = 1 - \frac{1764}{990} = 1 - 1.782 = -0.782$$

$p = -0.782$ (Significant at $p < 0.01$)

Therefore medical resource allocation is significantly negatively related to identified need.*

*This statement must be considered in relation to the well known higher incidence of other physical, neurological, and physiological for the mentally retarded.

2. How about non-medical resource appropriation?

   While the above statistic pertains only to medical care, 69% of all identified handicapped children were not receiving any other form of assistance (such as speech therapy, physical therapy, guidance, psychiatric therapy, and similar help from other professional and public sources).

3. Can educational programming help?

   Of all the children receiving help (medical or non-medical) 75% were doing so while in an educational program.

4. Do problems tend to be identified at an early age?

   Only 25% of the pre-schoolers were receiving medical assistance, as compared to 85% of the older children. Only 19% of the pre-school children were receiving other forms of assistance (not strictly medical), as compared to 48% of the older children. Of all the children receiving no help whatsoever, 91% were pre-school children.

5. Might this be true because parents of younger children are not at interested in receiving information regarding assistance?

   No. Forty-six percent of the parents with pre-school age children wanted information, as compared to 32% with older handicapped children.

6. How serious is this problem?

   In Madison 4.8% of all school children attend special education classes aimed at a variety of disabilities. However, there is a serious problem of identification. In fact, of all the handicapped

children identified in the 1966 census only 32% were known to the Bureau for Handicapped Children.

7. Why is this so?

The Madison census report states:

> Wisconsin requires each school district to conduct an annual school census and report all children of school age not in school. It does not, however, stipulate how this survey is to be taken. Madison has conducted such a census each spring, taken by census enumerators canvassing from home to home. The census workers are paid a set amount for each child recorded, whether handicapped or not.
>
> The information is especially helpful in determining general school population growth and shifts as it relates to need for school facilities, programming, staff and budget. It is equally valuable to those of us working with handicapped children, both in the identification and planning for special programs. However, we found that many of the children in our community were not identified. There appeared to be a number of reasons. Among them were: a) parents did not recognize the problem or chose not to identify it, b) did not know of the community resources, nor did they know that there were people who cared and wanted to help, and c) census enumerators did not ask about the handicapped, because they thought it an infringement upon the privacy of the home. Those not reported during this regular school census were generally identiby another community resource, or upon enrollment in school when it was found they were making a poor adjustment to school (Page 10 of the census report).

8. How do the Madison data relate to all of Wisconsin?

The mandatory all-Wisconsin census clearly underestimates the extent of the problem of handicapped children. Assuming Madison to be representative OF THIS UNDERESTIMATE, the Madison survey shows that the statewide survey identified 82.4% of the number of children identified by the Madison study. Neither survey claims to be exhaustive (both used sampling techniques), and it is interesting to

note again that only 31% of the sample was known to the Bureau for Handicapped Children. Therefore, the most cautious generalization to a statewide level would consider the Madison study as some index of statewide need in this area.

TABLE I

1968-69 CLASS AND RESIDENTIAL UNITS FOR HANDICAPPED CHILDREN*

Types of Handicapped	of Elem. Class Units	Jr. & H.S. Class Units	Total	Residential Facilities	Present No. of Children	Current Estimate of Teachers Needed
Educable Retarded	599	192	791		14,280	)
Trainable Retarded			222		16,278	)– 316
Orthopedic			34		1,183	) 273
Multiple Handicapped			24			
Deaf and Hard of Hearing	87	17	104	36	925	172
Visually Handicapped	17	7	24	44	348	49
Emotionally Disturbed	55	14	69	0	425	1,521
Special Language/ Learning	20	0	20		158	929
Speech Correction				Full and Part Time 434	30,380	556

Examination of the estimates of teachers needed and children presently being served provides some clue as to areas which remain to be served adequately. Since we reach approximately 50% of the known handicapped population, over 30,000 remain to be adequately provided for.

*From the Kellet Commission Report of Department of Public Instruction.

VOCATIONAL EDUCATION

Based upon: data from a three-year (1965-68) pilot program in 34 comprehensive high schools in Wisconsin (Source I) and the Northshore vocational education study (1968) (Source II).

Questions Asked of the Data:

1. How representative are these pilot schools of Wisconsin as a whole?

   Geographic Distribution of pilot schools

   Northwest: 8

   Southwest: 6

   Northeast: 6

   Southeast: 14

   Location of schools: in 29 municipalities, in 21 counties, in 14 (of 19) CESA districts, in industrial and non-industrial areas.

   School population distribution:

200 - 500:	5
500 - 700:	6
700 - 1000:	6
1000 - 1500:	4
1500 - 2000:	4
over 2000:	9

   It seems reasonable to assume that the pilot schools are slightly more advanced in their programming for vocational education than non-pilot schools. Therefore, we assume that data from the pilot schools, if anything, provide an underestimate of educational need (and, therefore, at least an estimate).

2. What are the post-high-school plans of students in the pilot schools?

   Forty-eight percent of the total sample of students in grades 10

and 12 indicated plans to enter a college or university following graduation from high school. However, only twenty-eight percent of "college-bound" students expected to finish college or university. This figure is particularly revealing since forty-percent of all students indicated that they "were not enrolled in courses which are intended to prepare them for a job following high school graduation, and the major reason reported among the best reasons for not being enrolled is that college prep courses are more important...." (p.10)

3. When do students begin thinking about making these plans? Students indicated when they first were aware of the need to begin thinking about preparing for a job. The graph below summarizes the findings of this study.

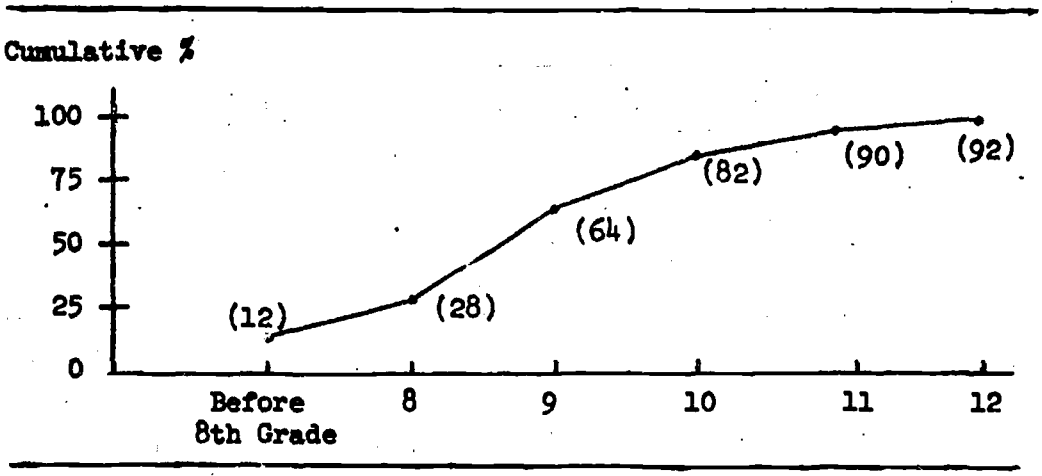

Figure 3. A graphic presentation of data showing at what time children begin making vocational plans.

"Twenty percent of all students reported plans to enter military service, 5% had no idea of their future plans, 2% indicated a desire for an apprenticeship, and 1% indicated that they would 'just take it easy'."

Hence, by the ninth grade over half (64%) of all students surveyed began thinking of preparing for a job.

4. Do they feel they are getting enough information for making these plans?

The extent to which sophomores and seniors say that they either need more information than they now have or have received none but desire information is presented below.

	Sophomores	Seniors
% needing more information about jobs, requirements, demands, etc.	80%	61%

5. Who is most influential in helping students to make these plans?

In both studies, students consistently rated parents as more helpful than guidance counselors* in terms of providing information about which school courses to take and in terms of helping students make plans for activities following high school graduation.

6. Is this because counselors in the pilot schools are not spending enough time on this aspect of guidance?

No. Table III presents a rank-ordering of the amount of time spent on specific tasks (in pilot schools) in counseling with students.

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*Parents were rated by students as more helpful than counselors 100% of the time in the Northshore study. The following are cited as influential in rank-order.

	Mean Rank	
Self	1.0	(most influential)
Parents	2.0	
Teachers	3.5	
Counselors	4.0	
Friends	4.5	(least influential)

TABLE II
(Source I)
How Counselors and Students Spend Time
on Specific Student-Counseling
Tasks

	Average Rank (from 1 to 10)*		
	Guidance Counselors	Guidance Directors	Students
College Preparation (courses, applications, etc.)	3.67	2.67	2.00
Vocational-Technical Schools and Apprenticeships	7.33	6.67	7.67
Job Placement	9.50	8.00	6.33
Helping Solve Personal Problems	2.00	3.00	7.00

*1 = most time spent, 10 = least time spent.

Table II indicates that there is considerable aggreement between students and guidance counselors regarding the high allocation of time to college preparation counseling, and the low allocation of time to vocational, technical and apprenticeship counseling. The discrepancy between students and counselors regarding time allocated to job placement is interesting and indicates that both student and counselor spend little time on this, although it is of considerably higher priority for the student. The discrepancy regarding time allocations for the solving of personal problems is also interesting (2.00 for counselors, 7.00 for students), and suggests a conflict area that may tend to reduce counselor influence: Counselors feel that they place a great time emphasis on helping students solve personal problems, but students see this effort as minimal.

7. Do students attach a stigma to the term "vocational"?

There is an interesting difference in attitude between students and school personnel regarding negative connotations of the word "vocational."

	SCHOOL PERSONNEL[1]	STUDENTS[2]
Percent who do think the term "vocational" has a stigma among students	64%	11.5%

[1]Guidance counselors, guidance directors, vocational education teachers, administrators, and advisory committee chairmen.

[2]Sophomores and seniors

8. How do parents feel about vocational education?

Parents consistently express strong support for vocational education programs for all students (85% of parents suggest this). They emphasize the need for programs which stress:

a. Vocational applicable skills, and

b. Economic, business, and human interaction understandings.

9. Why do students avoid taking vocational education courses?

In the pilot project study, of all the students who did not take a vocational course 40% did not do so because they considered college prep courses more important; 20% did not do so because the kind of course they wanted was not offered; and 19% did not do so because "there was no room in their schedule" (p. 12).

Inflexibility of scheduling may be quite an important factor. Since Shorewood High School (Milwaukee) made the transition to a 7-period (from a 6-period) day, course enrollments in senior high school vocational courses have increased at a rate of approximately 9% per year (from 1966-69). This result is dramatically replicated in the Whitefish Bay High School. The Northshore study (1968) states that:

> The shift from a six to a seven-period day has resulted in a marked increase in vocational program enrollments. The three-year pattern reviewed ('65-'68) showed increases of 75% for Home Economics, 160% for Business Education, and 35% for Industrial Arts (Section NVES-IID-5;D7).

10. What happened to graduates of vocational programs of the pilot schools?

In a follow-up study of graduates from vocationally-oriented courses in the pilot schools (4,200 graduates) the largest categories presented were:

15% entered post-high school vocational programs.
14% entered four-year colleges.
66% directly entered the labor market.
4% entered the military.

According to the 1965 position paper on dropouts to the Governor's Committee on Children and Youth:

> Of the boys who dropped from school, 22 percent joined the armed forces and 20 percent secured full-time employment other than at home. Of the girls who dropped from school, 41 percent became housewives.

and

> Over 20 percent of high school dropouts in districts served by vocational schools attended vocational school on a full or part-time basis, compared to less than 3 percent in districts not served by vocational schools (pp. 18-19).

11. What kinds of teacher training needs exist in vocational education?

TABLE III

Teacher Needs in Vocational Education, Wisconsin Public High Schools, Status in 1968 and Projection for 1973

In the school year 1967-68, 1,083 persons were employed in professional vocational education positions in reimbursed programs in Wisconsin public schools; a breakdown by types of employment and five-year projection is as follows:

Occupational Area	Actual Employment 1968		Projected Employment 1973*	
	Wisconsin	Milw. only	Wisconsin	Milw. only
Agriculture	1	0	350	5
Distribution	58	8	125	15
Health	2	0	25	5
Home Economics	170	15	400	15
Office	298	60	600	80
Industrial	177	45	400	90
Vocational Guidance	26	15	200	15
Local Supervision	64	4	210	20
	1,083	147	2,310	245

(*With the exception of distributive education, most of these teachers will come from within the ranks of presently employed teachers; teachers will become vocationally certified principally through in-service and additional work experience.)

Greatest needs identified by the Governor's Committee on Children and Youth were to:

- Provide work experience for teachers
- Upgrade vocational competencies of present teachers
- Develop competent local supervisors of total vocational program
- Develop competent local supervisors of cooperative education program
- Attract new persons into teaching and hold present teachers in education.

THE SCHOOL DROPOUT PROBLEM IN WISCONSIN

1. Are school records kept on dropouts?

   No. However, we do have information on "withdrawals." Withdrawals are "not to be confused with 'dropouts'. Caution should be exercised to distinguish between the two terms. Wisconsin schools are not required to record and report 'dropouts'. [However] withdrawals do not include transfers to other schools." (Education Information Systems, Department of Public Instruction, 1969). The report of the Department of Public Instruction to the Kellet Educational Task Force says that: "Wisconsin ranked fourth in the nation in 1967 for holding high school students through graduation. This, however, does not provide great comfort when we realize that some 9,000 children in 1967-68 were classified as withdrawals. It must be assumed that the majority of these are dropouts."

2. If there is a "withdrawal" problem in Wisconsin, what does it look like? What are the trends over time?

   The graph on the following page shows some interesting trends.

   a. Notice how much each curve is "bowed" or U-shaped. Roughly, in going from ninth to twelfth grade, the curves get increasingly "bowed."

   b. The percentage of dropouts is increasing in all four grades but much more so for the eleventh and twelfth grades.

   c. There is a "deep trough" for both eleventh and twelfth grades from about 1962 to 1965.

   d. A conclusion of the 1965 position paper to the Governor's Committee on Children and Youth is supported, namely that requiring compulsory attendance to age 18 tends to delay, but not prevent, dropout.

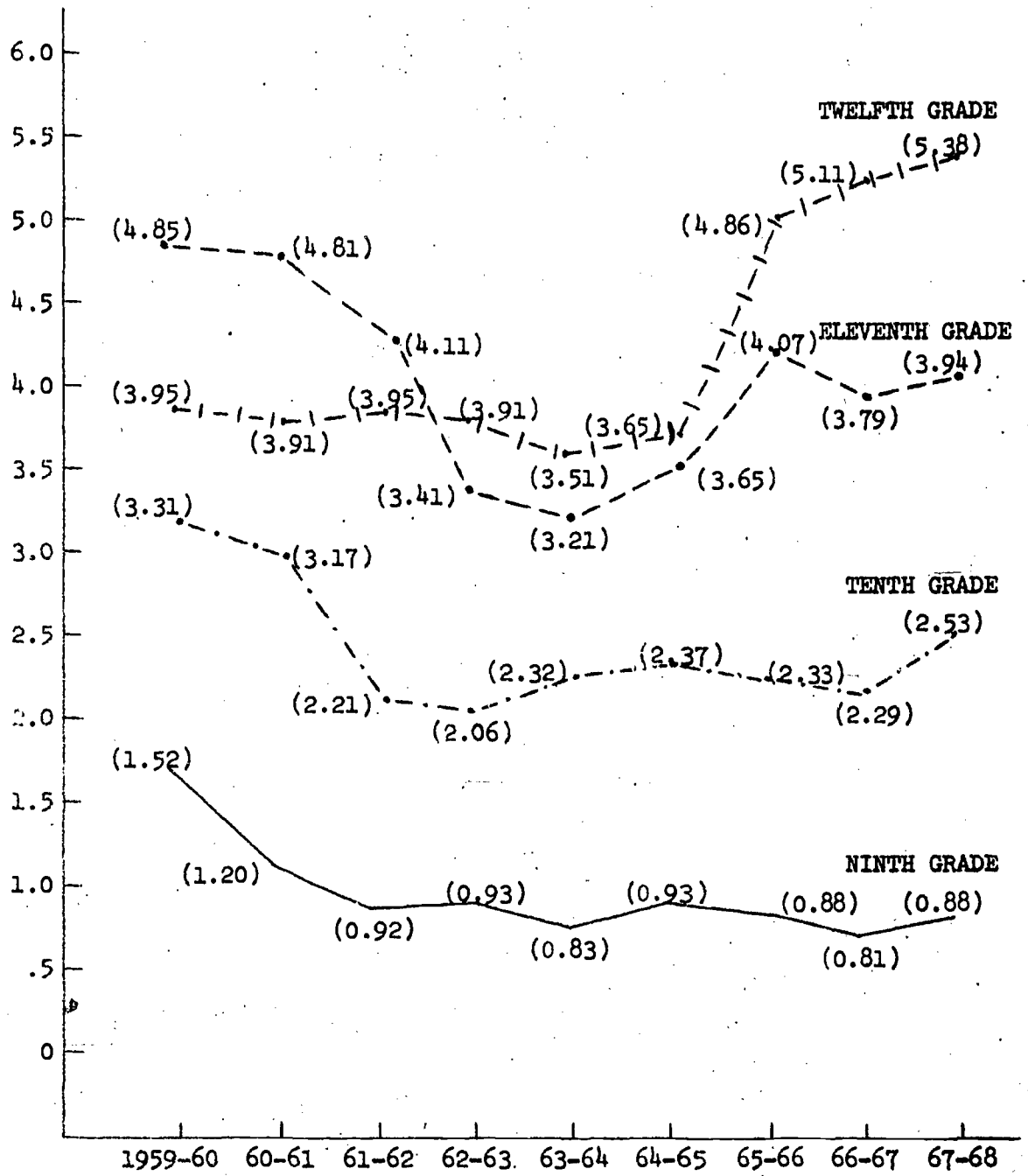

FIGURE 4. Percentage of students withdrawing from public high school in a nine-year period, (NOTE: See Kellet Report, 1969, p. 49). These figures do not include transfers and, therefore, "it must be assumed that the majority of these are dropouts."

3. How do you explain each of these?

We can only form hypotheses with the available data. We do know that law makes school attendance mandatory up to but not including eleventh grade. It might be interesting to combine eleventh and twelfth graders in one graph.

We might also ask what possible factors are related to the deep trough for these two grades from 1962 to 1965. We will now look at the relationship between percent of withdrawals for these grades and other variables.

4. What <u>are</u> possible explanations?

We asked ourselves several questions. First, we wondered if percent increases in federal aid were in tune with the increasing problem of withdrawals. The correlation between percent increases in federal assistance to Wisconsin and percent of withdrawals is 0.3752. We can statistically interpret the strength of this relationship as positive of accounting for approximately 14.08% of the fluctuation in percent of withdrawals.

Second, what about percent of increases in state aid? Here the relationship is 0.5247, quite a stronger relationship (27.53% as opposed to 14%). We might have expected a higher relationship here than for federal assistance.

Third, what about percent of increases in local school property taxes? Here the correlation is -0.5306 (a slightly stronger though NEGATIVE relationship, accounting for 28.15%).

Can we add these percents to see if we have "cornered" the problem?

We can do this since these three variables are "fairly" independent.*

If we do this, we have "cornered" the problem 69.76%.

5. Can you argue from correlation to causation?

Not exactly, but one can make strong inferences.** For example, consider the graph presented on the following page regarding the relationship between percent increases in school property taxes and percent withdrawals from eleventh and twelfth grades combined. The causative inference assumes that increased percentages in school property taxes increases <u>causes</u> the lowering of the withdrawal percentages. This can be partially checked by calculating the lagged

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*Correlation Matrix showing relative independence of trends in funding sources.

	% State Increases	% Federal Increases	% School Property Tax Increases
1	1	2	3
1	-	-0.0104	0.1591
2		-	-0.2904
3			-

**See Blaylock, H. M. <u>Causal Inferences in Non-experimental Research</u>, University of North Carolina Press, Chapel Hill: 1964.

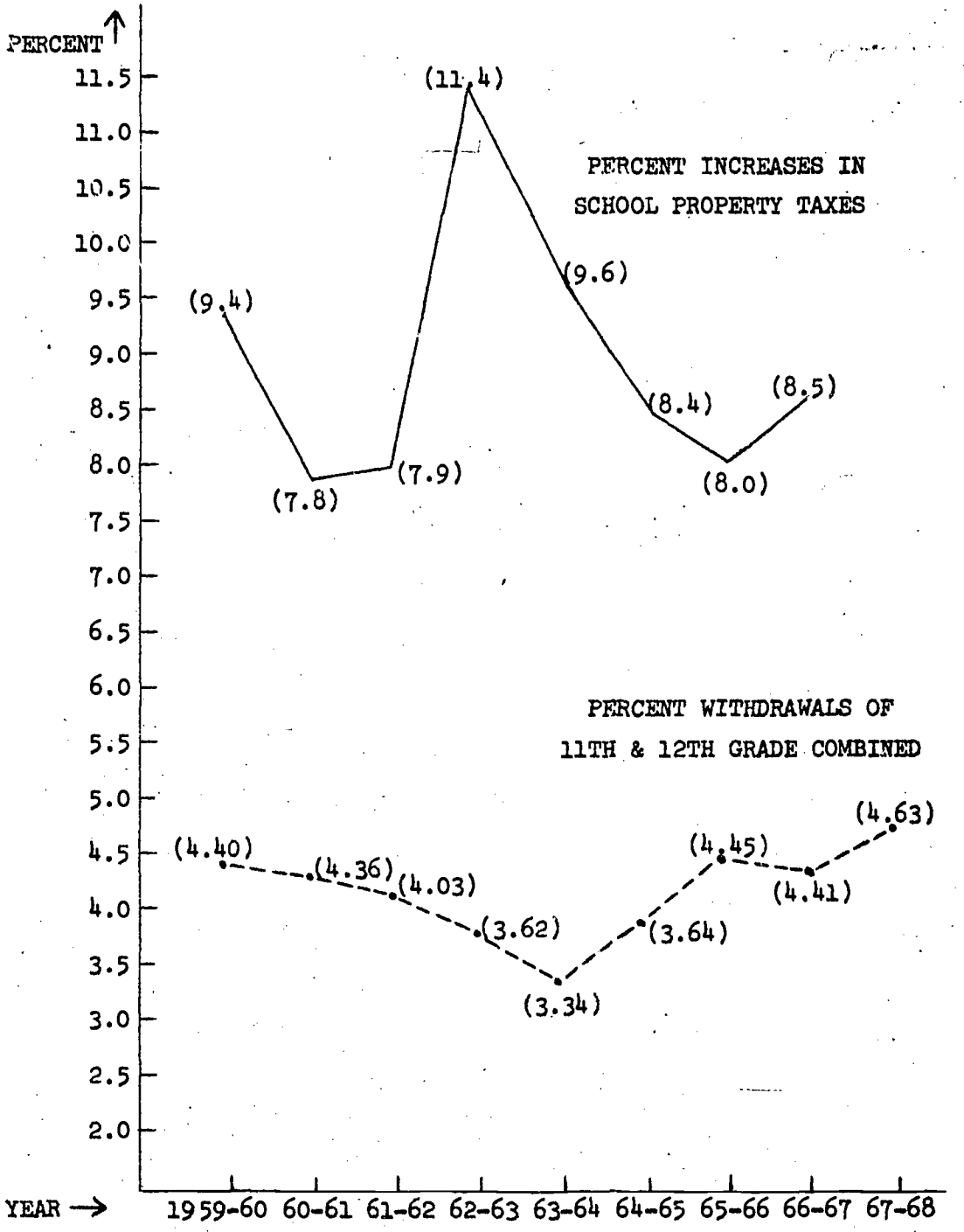

FIGURE 5. A pictorial comparison of the relationship between property tax increase and school withdrawals.

correlation coefficient. If event A causes event B, event A should precede event B in time. Hence we might expect to find a stronger relationship between an increased percent of property tax one year and withdrawals the following year. The lagged correlation coefficient is -0.5447 as opposed to -0.5306 for the unlagged coefficient, an improvement in prediction of 5.12%.* Therefore, perhaps the most sensitive variable which can be assumed to control the dropout problem is local rather than state or federal.

6A. What are the reasons students give for "dropping out" of school?

The report to the Governor's Committee on Children and Youth stated that:

> Academic reasons--failure in one or more subjects and low academic ability--accounted for 27 percent of the reasons for dropping out of school cited by girls.
>
> Boys who dropped from school cited academic reasons, i.e., low academic ability or failure in one or more subjects, more frequently than any other reason.

6B. Is there any relation between the reasons students give for "dropping out" and teachers' perception of greatest need?

The Milwaukee Public Schools 1967-68 Evaluation Summary of Title I, ESEA, provides a rank-ordering of teachers' perception of critical needs in elementary, junior high, and senior high schools.

If we cluster the variables of discipline, attitude toward school, and attendance, we can see that this cluster of related variables is identified as a more critical need as we move from elementary to junior high to senior high school.

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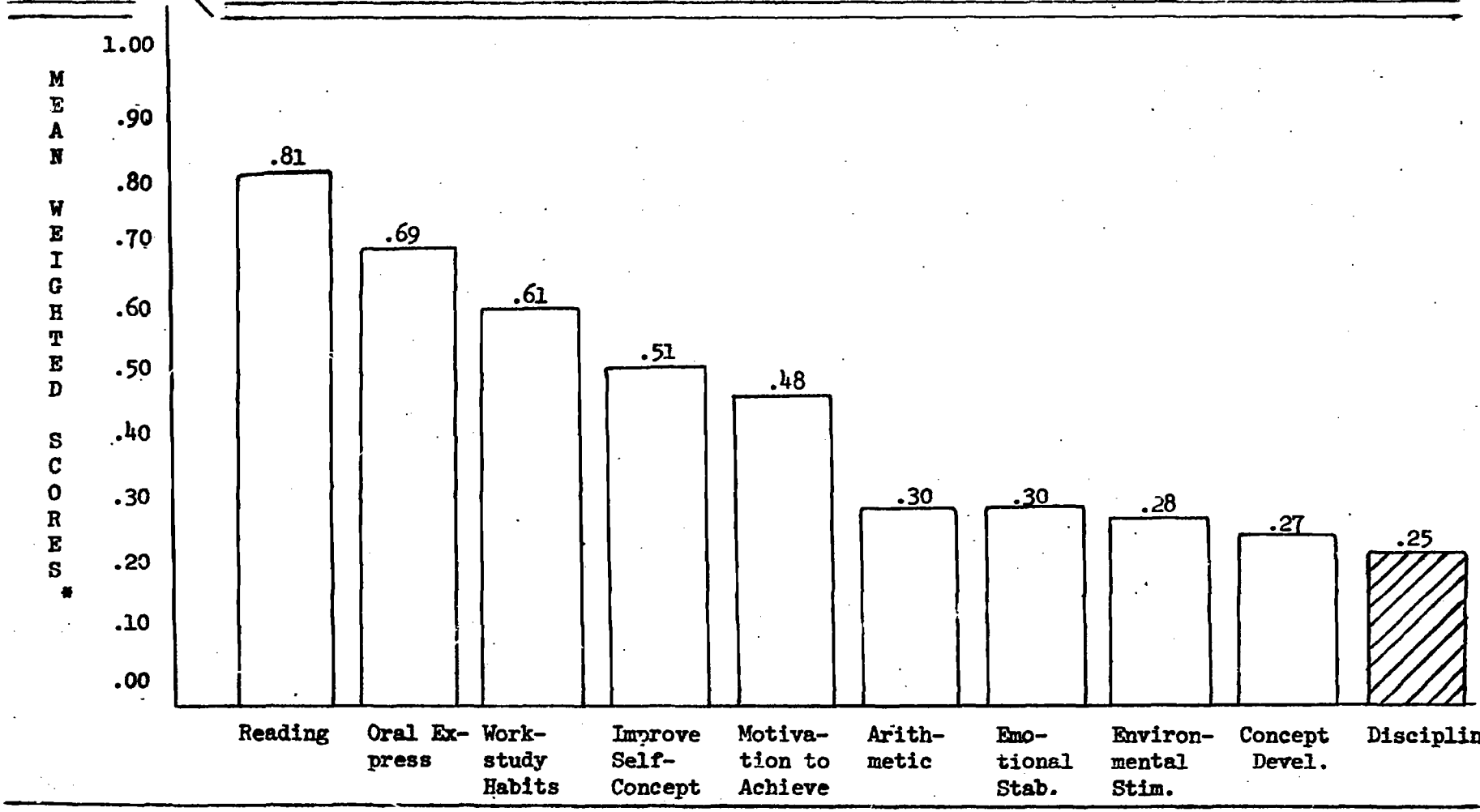
*Lagged accounts for 29.6698% of the variance; unlagged only 28.1536%; the difference is 1.52% (approximately); which is a 5.12% increase in prediction.

TABLE IV

TEACHERS' PERCEPTIONS OF AREAS OF GREATEST NEED

25 Elementary Schools



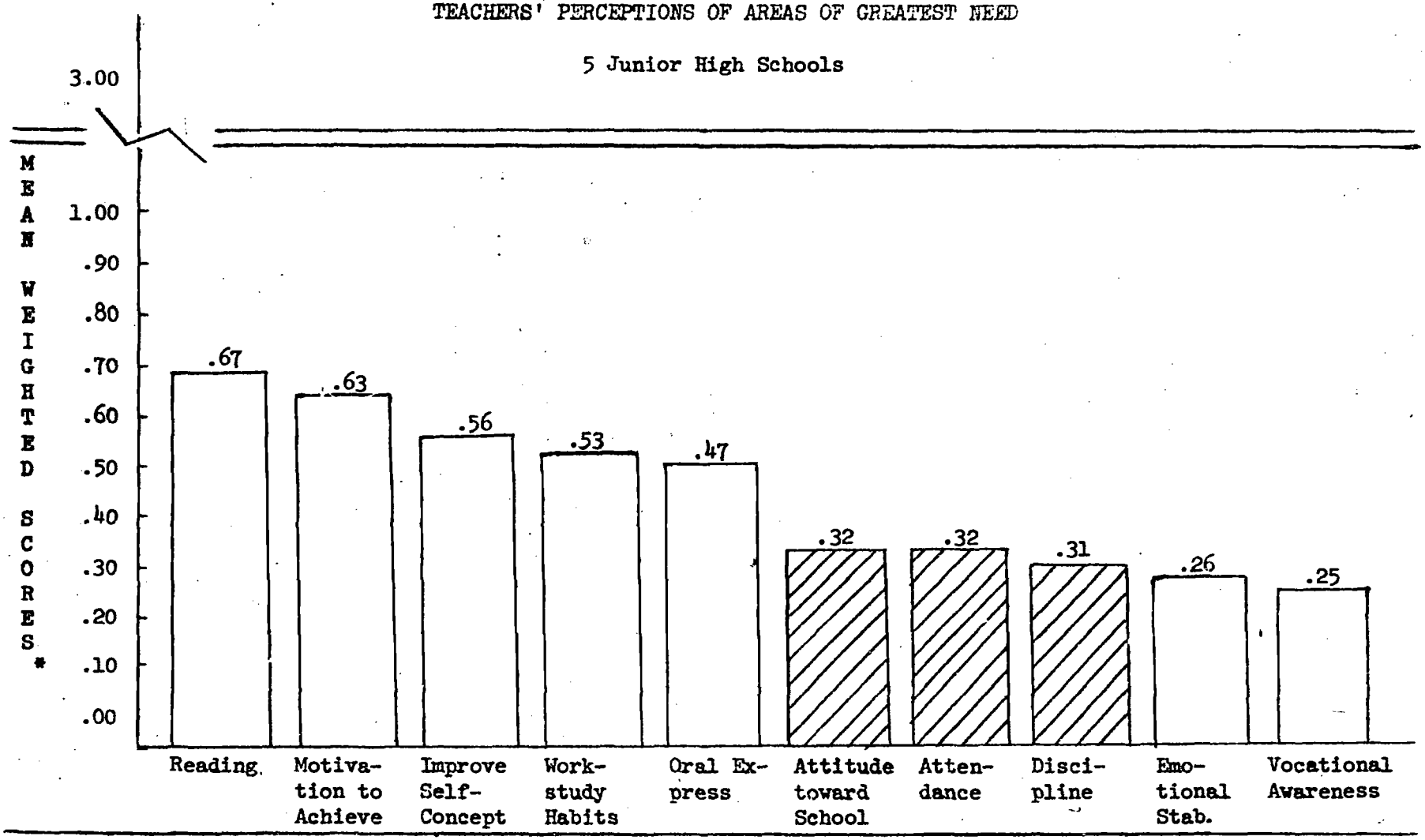
$$\text{*Mean Weighted Scores} = \frac{\text{No. of times item was 1st greatest need (3 points)} + \text{No. of times item was 2nd greatest need (2 points)} + \text{No. of times item was 3rd greatest need (1 point)}}{\text{No. of responses (3521)}}$$

**Possible Range of Mean Weighted Scores: 0.00 to 3.00

TABLE VI

TEACHERS' PERCEPTIONS OF AREAS OF GREATEST NEED

5 Junior High Schools



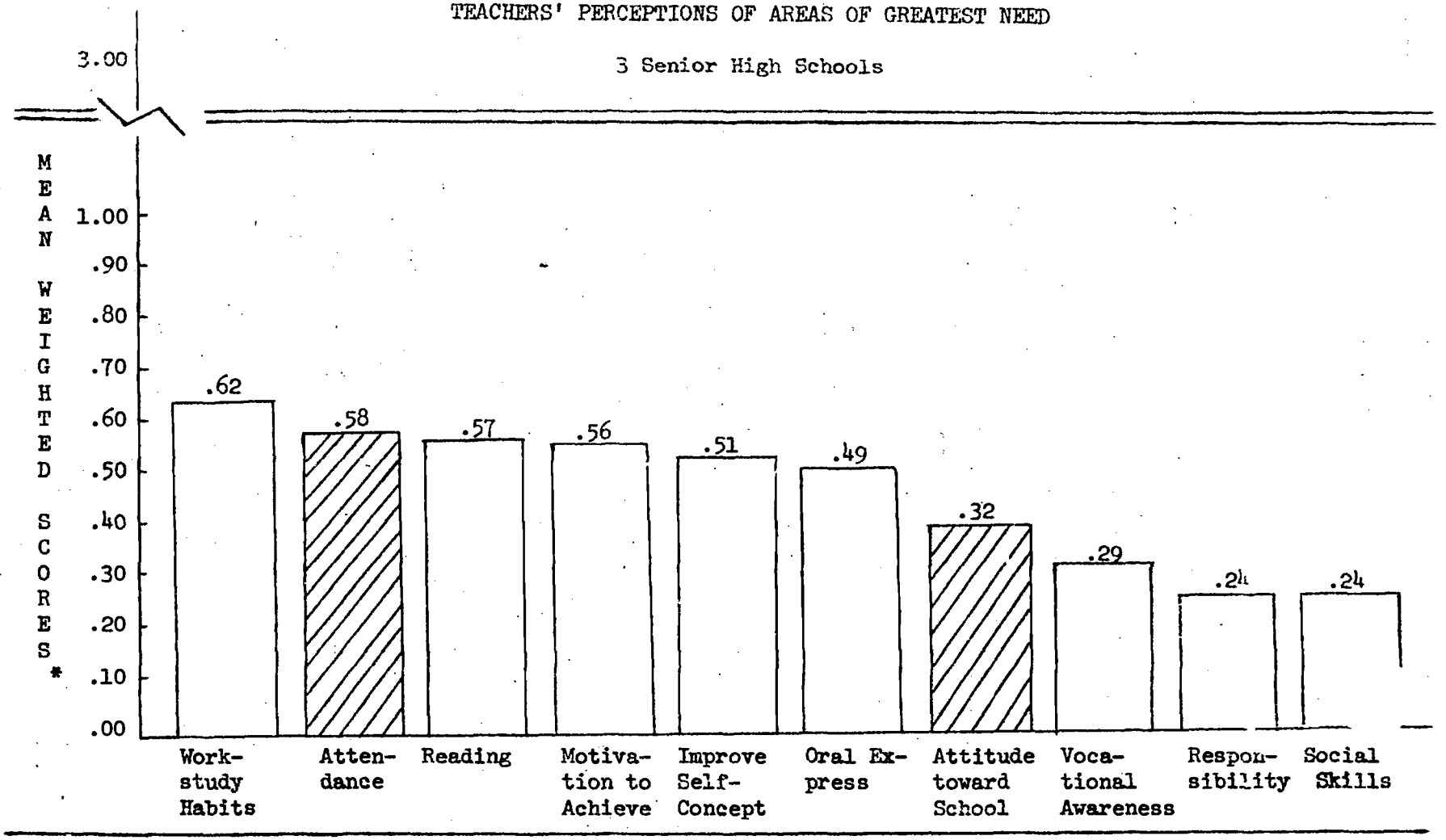
$$\text{*Mean Weighted Score} = \frac{\begin{array}{l}\text{No. of times item was 1st greatest need (3 points)} \\ + \\ \text{No. of times item was 2nd greatest need (2 points)} \\ + \\ \text{No. of times item was 3rd greatest need (1 point)}\end{array}}{\text{No. of responses (2586)}}$$

**Possible Range of Mean Weighted Scores: 0.00 to 3.00

TABLE V

TEACHERS' PERCEPTIONS OF AREAS OF GREATEST NEED

3 Senior High Schools



$$\text{*Mean Weighted Scores} = \frac{\begin{array}{c}\text{No. of times item was 1st greatest need (3 points)} \\ + \\ \text{No. of times item was 2nd greatest need (2 points)} \\ + \\ \text{No. of times item was 3rd greatest need (1 point)}\end{array}}{\text{No. of responses (3133)}}$$

**Possible Range of Mean Weighted Scores: 0.00 to 3.00

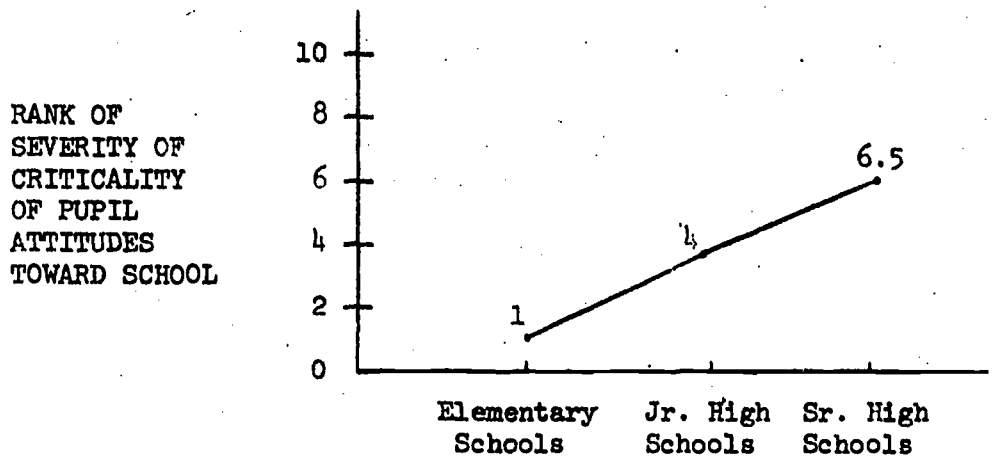


Figure 6. Teachers' perceptions of severity of criticality of pupil attitudes toward school.

Relating this finding to the dropout, we may suggest that:

a. The longer pupils are in school, the more negative their attitude toward school and learning becomes, as perceived by teachers.

b. In the minds of youth who drop out, their impression is that the reason they leave school is their own poor "academic ability."

7. Isn't Wisconsin tremendously overburdened in the area of local property taxes?

On the variable of local property tax revenue as a percent of total state-local property tax revenue (1966-67) Wisconsin ranks 41st of the fifty states (NEA report 1969-R1).

8. Is this relationship true for eleventh and twelfth grades taken separately (since these are the two grades where attendance is not mandatory by law)?

Yes, refer to the graph on the following page which fits the best* straight line to the data.

9. Is the withdrawal problem related to other educational factors?

One of the problems of nonexperimental research is that there may be another yet undiscovered variable at work. But we cautiously searched for the relationships between percent of withdrawals and other variables. We found that the yearly percent of withdrawals in twelfth grade is positively related to the percent of yearly increase of gross school operating costs (including transportation). The correlation is 0.8157, and the relationship is displayed in the following graph on page 28.

10. Has the average number of enrollments per school also been increasing over time?

Yes (See Figure 9).

11. Does this increase relate to rising operating costs?

The relationship is not a simple one. There seems to be an optimal school size relative to per pupil expenditures (See Figure 12).

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*"Best" in a least-squares sense.

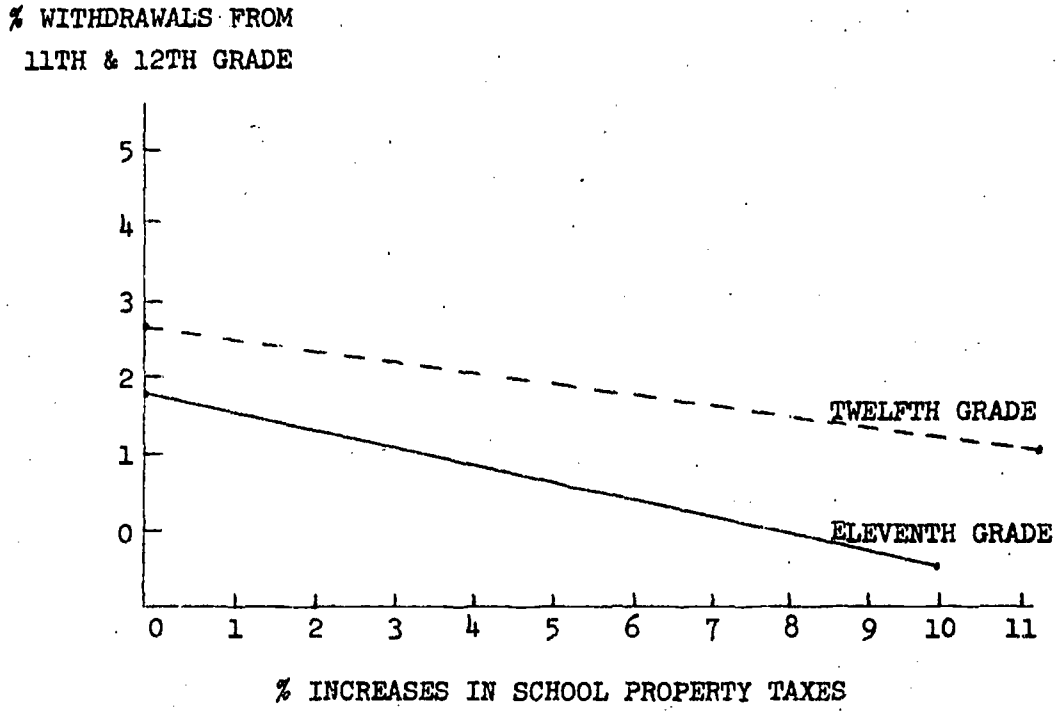

FIGURE 7. Regression lines of yearly percentage of students withdrawing in the eleventh and twelfth grades and the percentage of increase in school property taxes. CONCLUSION: The percentage of withdrawals from eleventh and twelfth grade decreases as the percentage of increases in school property taxes increases.

ELEVENTH: $Y = (-0.2314)X + 1.9340$

TWELFTH: $Y = (-0.1408)X + 2.8566$

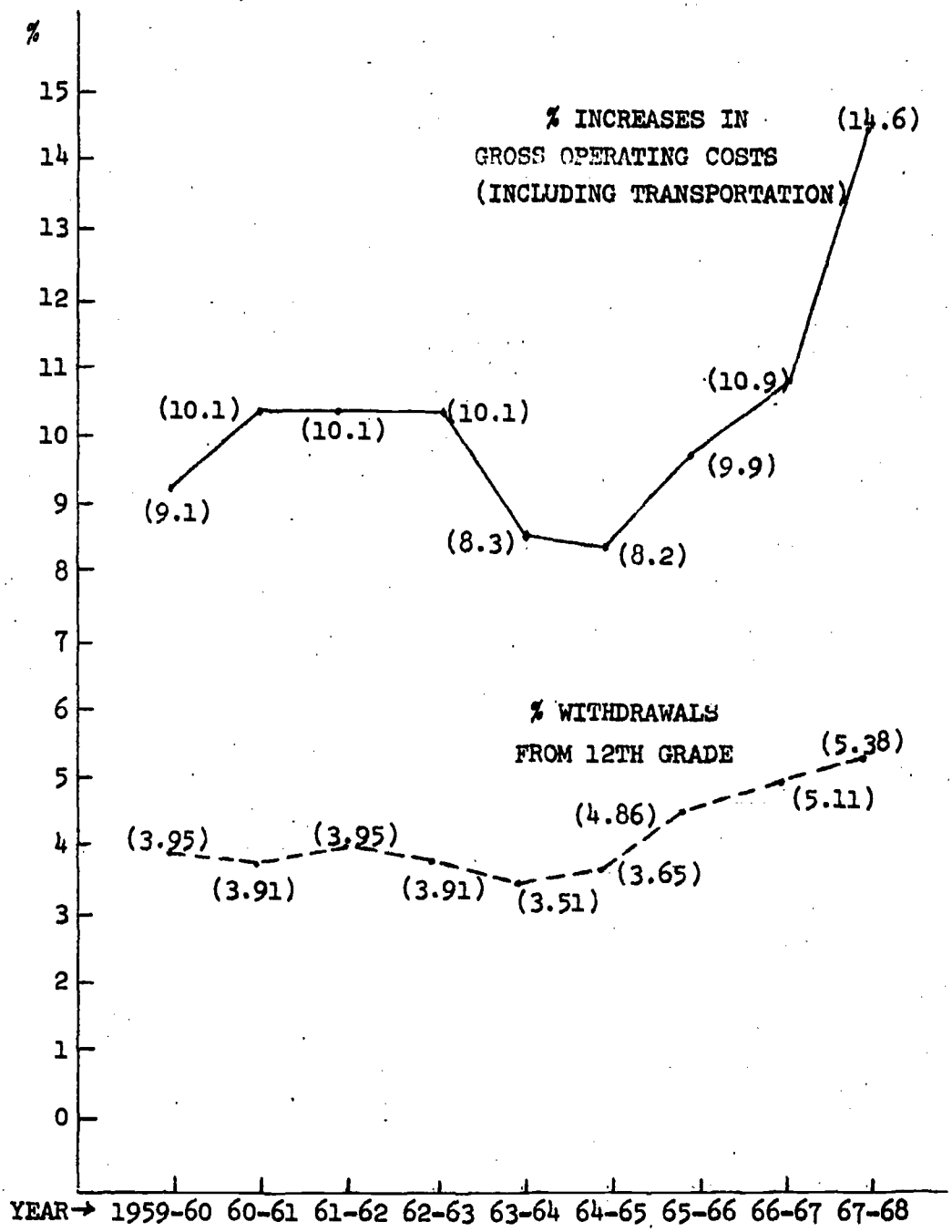

FIGURE 8. Yearly increases in percentage of gross operating costs compared with the yearly percentage of withdrawals from the twelfth grade.

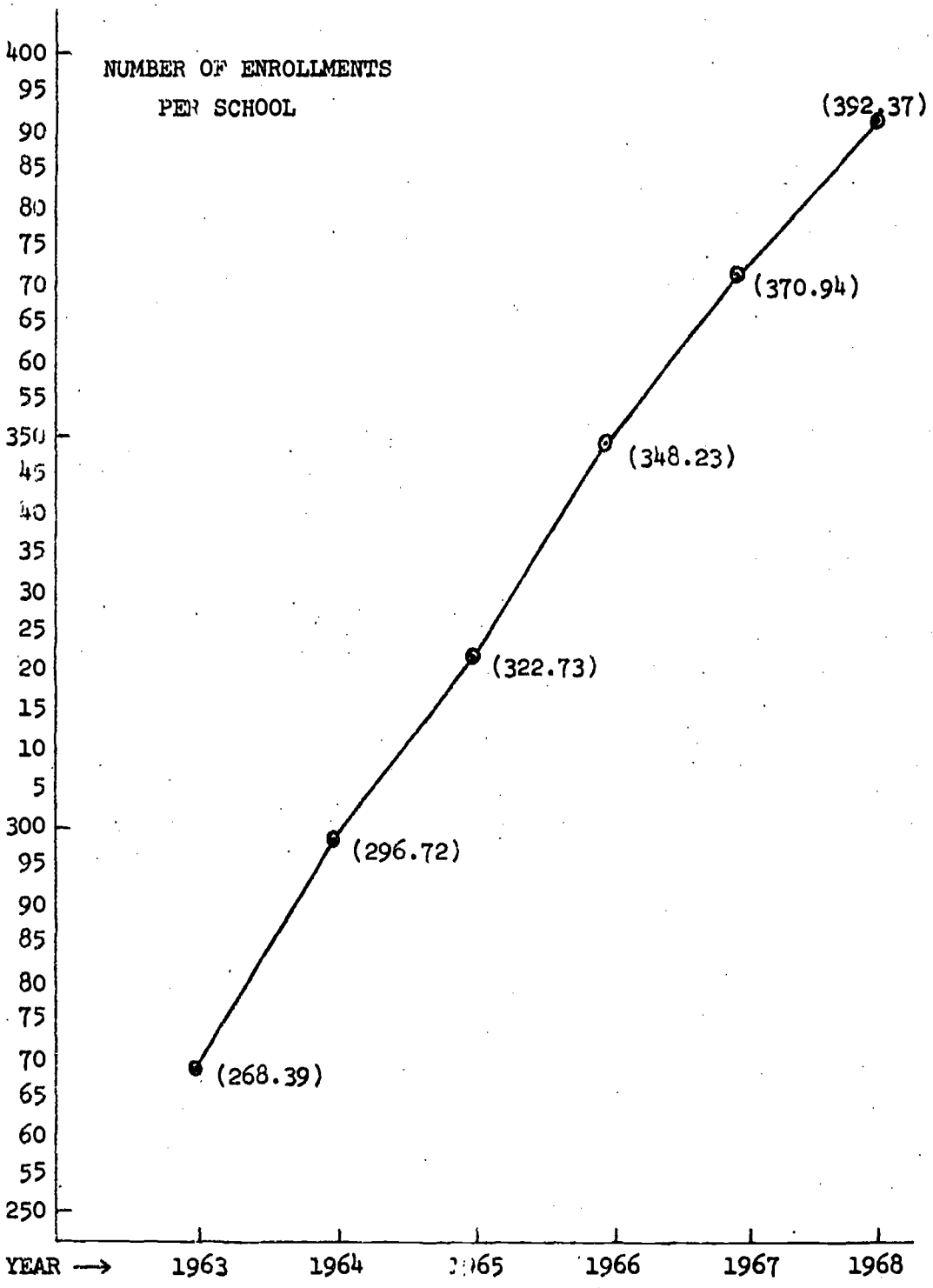

FIGURE 9. The average number of enrollments per school (elementary, junior high, high school) has been increasing steadily since 1963 (there has been nearly a 50% growth in this period).

12. Are teachers increasingly overburdened as school size increases? Perhaps this may relate to the withdrawal problem?

No (See Figure 10).

13. Are fewer course options open to students in larger schools that are forced to service a larger student population?

No (See Figure 11).

14. Is this factor of school size and course offerings related to the relevance of high school preparation for the post high school activities of students?

Yes. In 1957, 31.8% of high school seniors went on to college; in 1967 the figure was 45.4%. However:

> Various studies report that only 20% of high school graduates go on to achieve a baccalaureate degree; the remaining 80% need to be served with an educational program that is realistic in terms of their needs.*

Because high schools are devoting an effort toward the college-bound, only 20% of academic students are being appropriately prepared for future employment. In addition to this:

> Although 381 high schools have one or more reimbursed vocational programs (279 have agriculture only), there are relatively few that have five or more courses which relate to a variety of occupational fields.*

Therefore, while the college-bound effort seems to be strong it is clearly problematic.

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*Page 146 of the Wisconsin State Department of Public Instruction Report to the Kellet Commission, 1969.

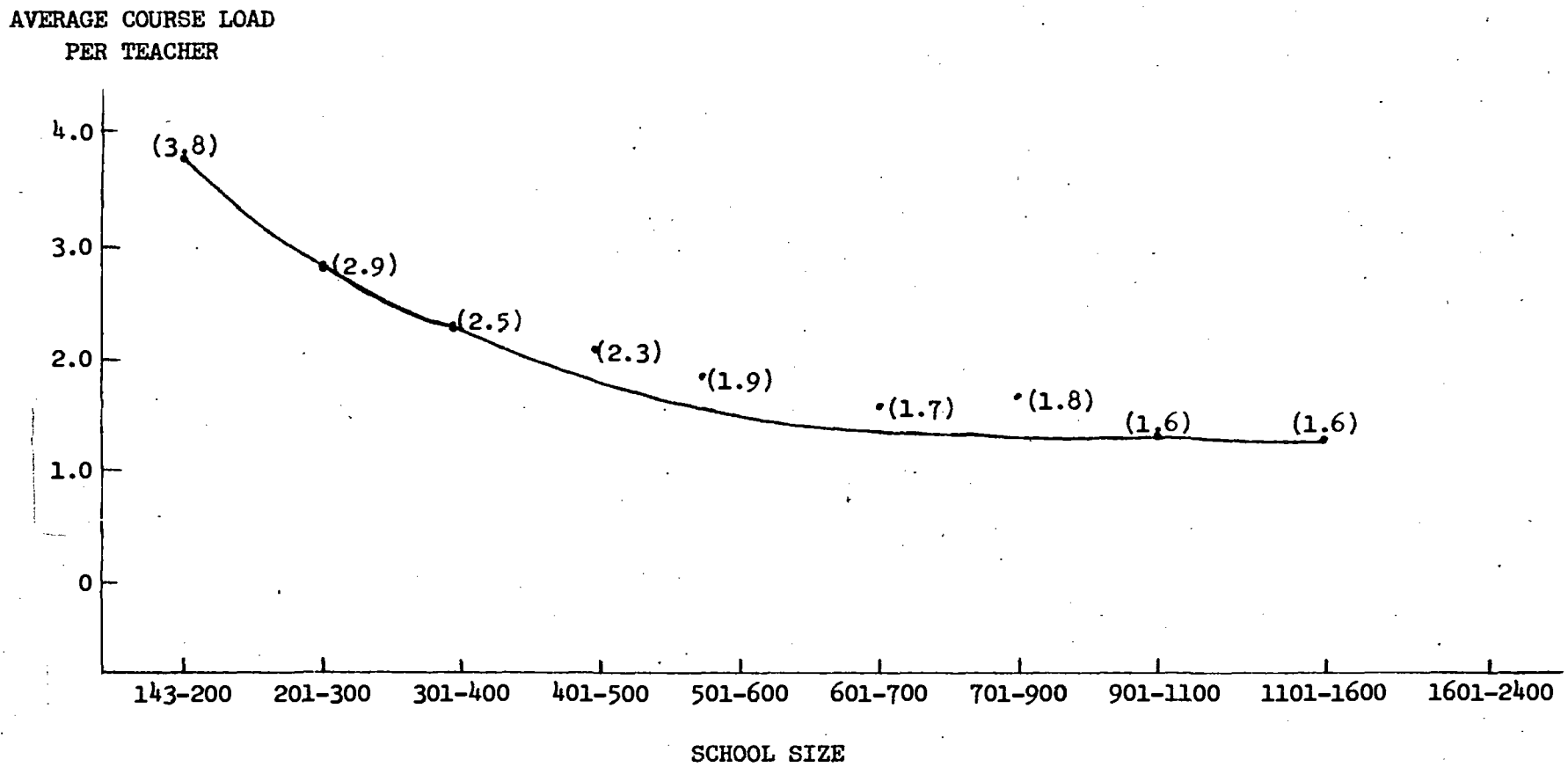


FIGURE 10. The average course load per teacher flattens at the 700-900 size and may remain constant thereafter.

AVERAGE COURSE OFFERINGS IN
WISCONSIN HIGH SCHOOLS (1967-68)

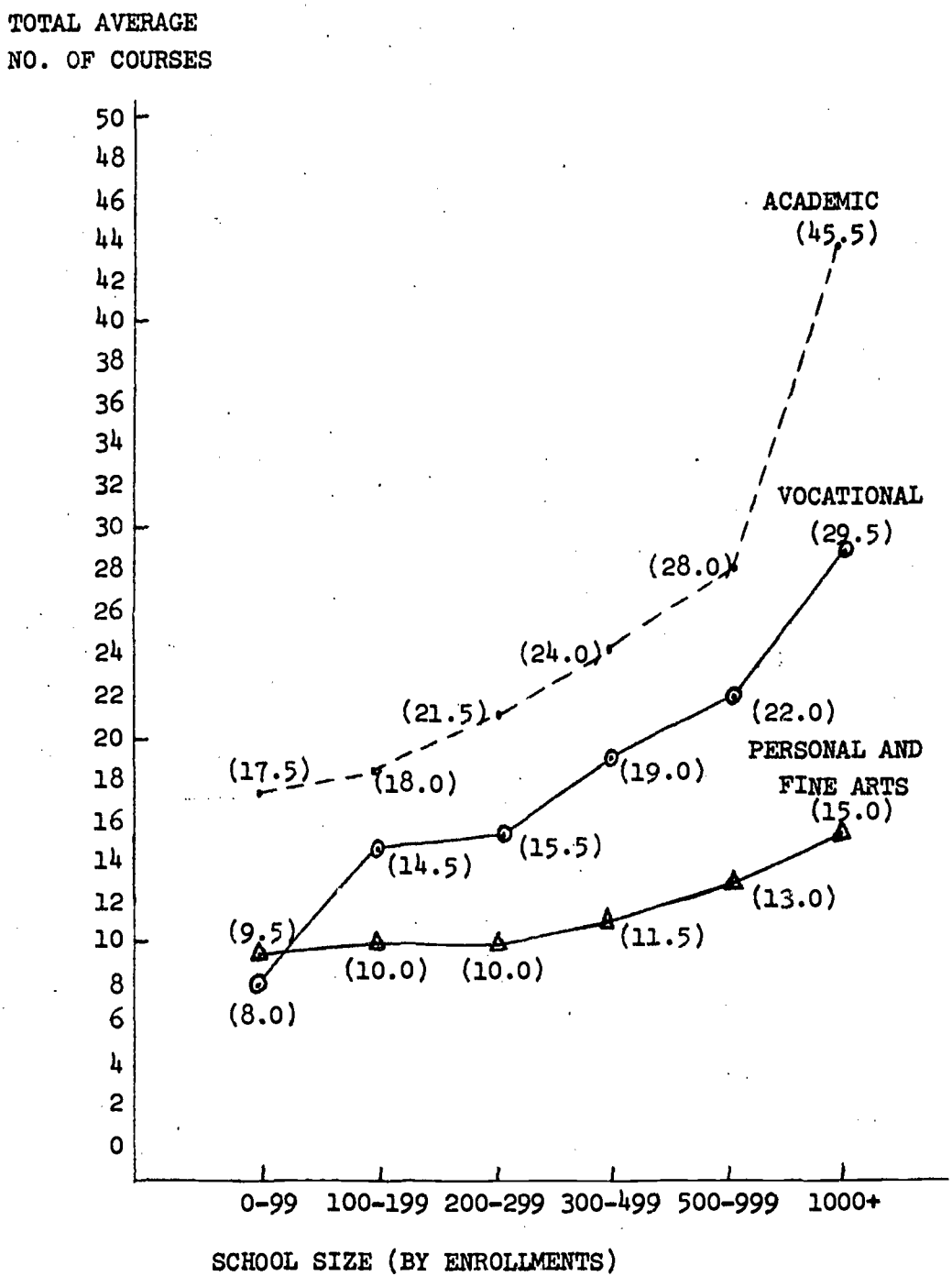


FIGURE 11. The correlation between <u>total</u> number of different courses offered and high school enrollment is .9856; that is, course offerings increase with school size.

OPTIMAL SCHOOL SIZE RELATIVE TO PER PUPIL COST

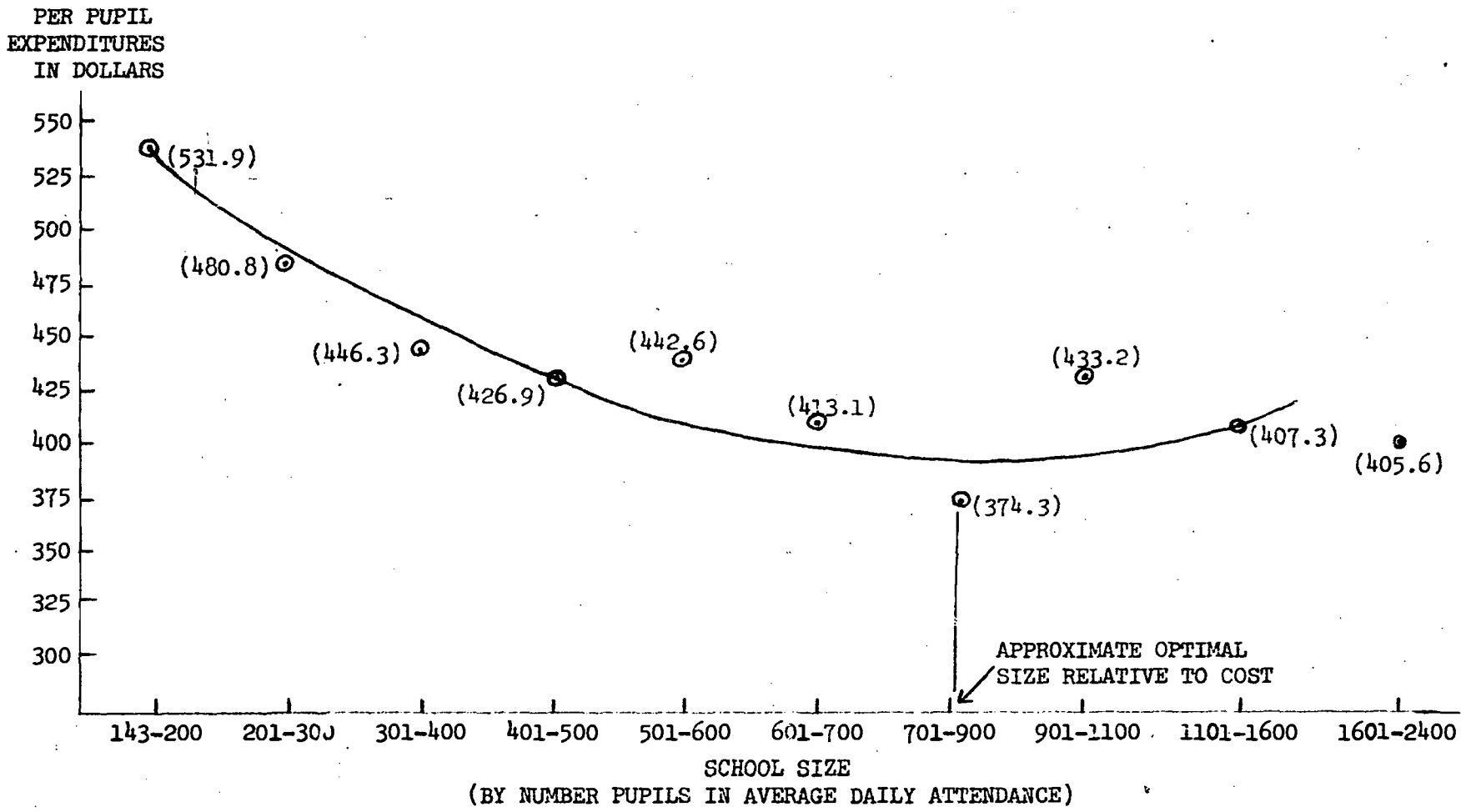


FIGURE 12. From a cost point of view, only, the optimal size of a school appears to be between 700 and 900 pupils (John Riew, 1967).

15. What do the staffing trends in school personnel look like over time?

See page 35.

Major Conclusions of the Graph

1. Administrative staff is increasing faster relative to teachers than teachers are increasing relative to students.

2. Pupil-teacher ratios are fairly stable for both elementary and secondary schools (over a five year period).

3. Pupil-teacher ratios are significantly lower in secondary school as compared to elementary ($t = 15.29$, $p << .01$, $w^2 = 95\%$).*

16. Since we are now discussing staffing patterns, it might be relevant to ask whether para-professionals are being used in the schools.

Yes.[1]

	Number	Percent
Districts with Aides	207	54
Districts without Aides	143	36.2
Districts Not Answering	45	11.4
	395	100.0

17. What do these aides do?[1]

The graph on page 36 shows the duties performed by aides.

---

*$w^2 = \dfrac{t^2 - 1}{t^2 - 1 + N_1 + N_2}$; $N_1 = N_2 = 6$

[1]W.E.A. Research Circular No. 2, "Teacher Aides in Wisconsin, 1968-69," February, 1969.

TEACHER-ADMINISTRATOR AND PUPIL-TEACHER RATIOS
FOR WISCONSIN PUBLIC SCHOOLS
1963-1968

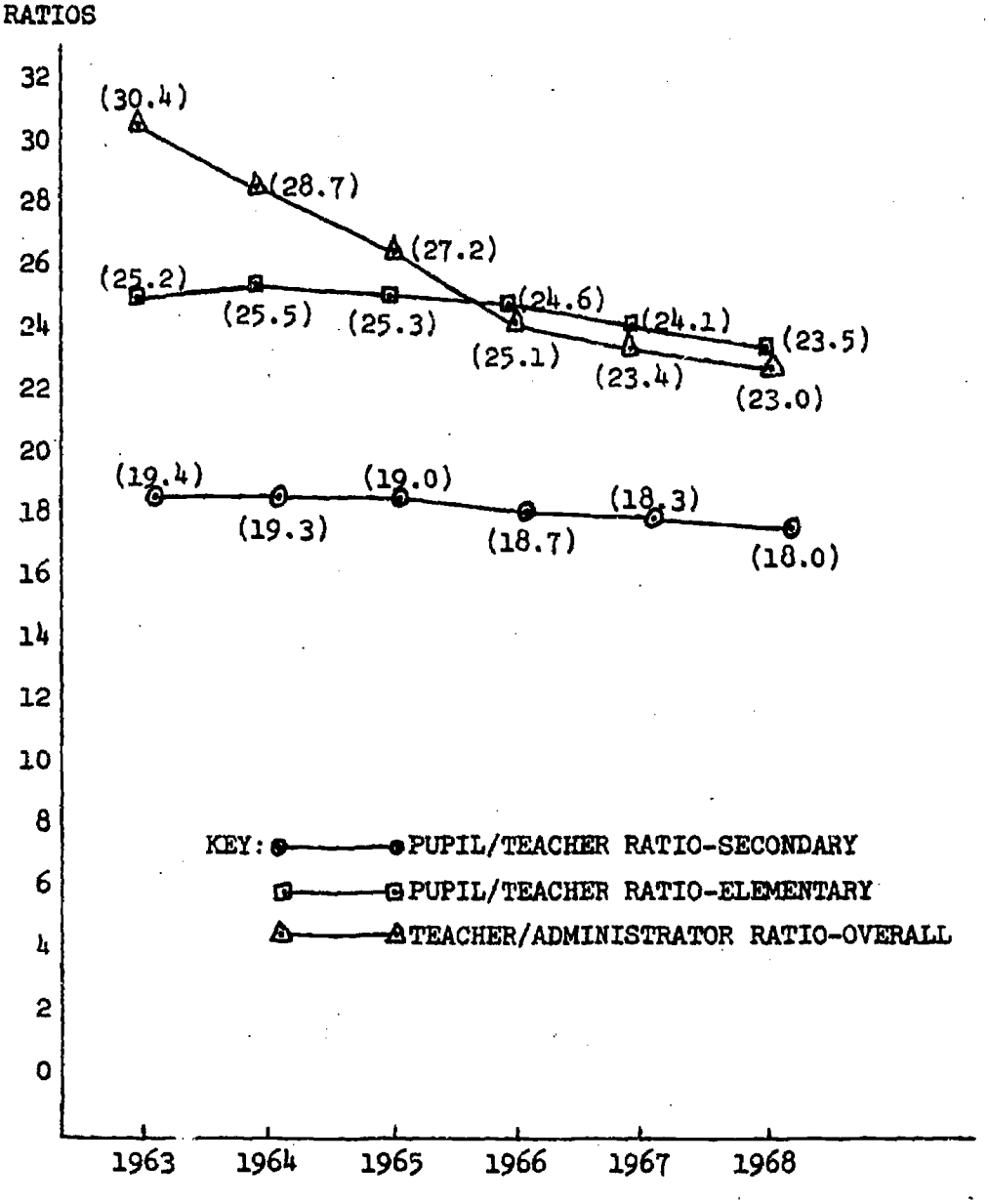
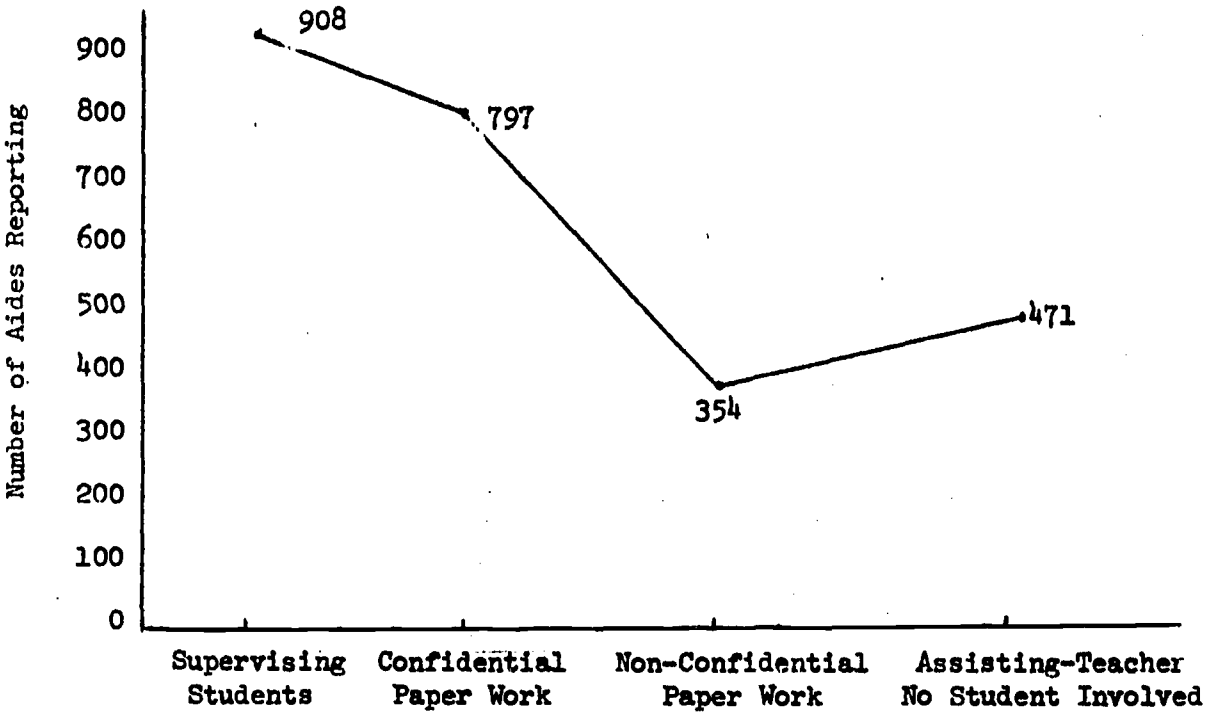


FIGURE 13. CONCLUSIONS: 1) Administrative staff is increasing faster relative to teachers than teachers are increasing relative to students; and 2) Teacher-pupil ratios are fairly stable for both elementary and secondary school over a five year span.

NOTE: Calculated from the information systems division of the Department of Public Instruction (1968-69).



Thus it is quite clear that teachers view aides as an important adjunct to the instructional program (interacting with students and handling confidential pupil personnel data) as well as an important source of help for non-confidential and non-student-involved work.

18. Is this legal?

Yes, under certain circumstances, it is.

The Wisconsin School code (118.19) provides that any person seeking to teach in a public school "shall first procure a certificate or license from the state superintendent." Several para-professional licenses are available; moreover the state superintendent has broad discretionary powers in this area.*

---

*Certification Standards, Department of Public Instruction, January, 1963, pp. 18-19, items 1-4.

19. Do Wisconsin para-professionals meet legal requirements?

No, probably not.

As outlined in Certification Standards in 1963, the three classes of certified para-professionals all needed three years of college education and relevant work experience for certification.

Yet a survey conducted by the W.E.A. found discrepant practices:

> Most districts required at least a minimum of a high school education to qualify for a paid aide position, however, 61 districts have no educational requirements for such a position. Fifty-one districts require some college experience and 16 districts require a minimum of two years of supervisory experience.

If teacher aides are going to be involved with pupil control and with confidential pupil-related material, and if schools are going to take advantage of the superintendent's broad discretionary powers to hire aides who do not meet standards set previously, then there is a need to reconcile this situation through enforcement or amendment of rules.

20. What are the patterns of teacher supply and demand, and what areas are currently critical? (See Table VII.)

TABLE VII

TEACHER
SUPPLY (% INCREASES) VERSUS DEMAND (% INCREASES)
IN WISCONSIN (1967-68)

Subject Field	Supply				# Positions in State Demand (Unfilled as of September 20)			
	1967	1968	% Increase	Rank	1967	1968	% Increase	Rank
Elementary	2144	2226	+ 3.82	10	40.0	97.0	142.2	3
Agriculture	46	58	+ 17.39	*	0	1.5	*	
Art	160	191	+ 19.37	5	12.5	9.5	- 24.00	11
Business Education	94	140	+ 48.93	3	7.5	2.0	- 73.33	15
Distributive Education	13	1	- 92.30	16	3.0	1.0	- 66.67	14
English	570	597	+ 4.73	9	6.0	6.5	+ 8.33	7
Foreign Languages (Total)	206	228	+ 5.82	8	3.0	2.5	- 16.67	10
Home Economics	183	223	+ 21.85	4	1.0	0.0	- 100.00	16
Industrial Arts	281	251	- 10.67	14	27.0	32.5	+ 20.37	5
Mathematics	214	214	0.0	12	7.0	17.0	+ 142.85	2
Physical Education (Total)	266	245	- 7.89	14	17.5	16.0	- 8.57	9
Music	167	165	- 1.19	13	17.0	20.0	+ 17.64	6
Science (Total)	219	223	+ 1.82	11	9.5	5.0	- 47.36	13
Social Studies	481	546	+ 13.51	7	2.0	2.0	0.00	8
Librarian	15	38	+ 153.33	1	4.0	9.0	+ 125.00	4
Guidance	39	45	+ 15.38	6	30.0	19.5	- 35.00	12
Special Education	142	225	+ 58.45	2	13.0	50.0	+ 284.61	1

* This figure would be misleading due to the zero in 1967.

1. Spearman's rank order correlation coefficient between % increases in supply and % increases in demand (1967-68): $\rho = -0.0161$
   There is essentially no correlation between increases in supply and increases in demand.

2. Cases for which % increases in demand exceed % increases in supply:

   Elementary
   Distributive Education
   English
   Industrial Arts
   Mathematics
   Music
   Special Education

21. Have Wisconsin schools undertaken a counseling program in the elementary schools?

Yes. In 1968-69 there were 143 counselors spending at least part of their time counseling elementary school students. Of these, 83 were full-time elementary counselors.

22. Is this enough elementary counselors?

Emphatically not. In 1967-68 there were approximately 500,000 students enrolled in grades K-6 of Wisconsin public schools. Assuming that high school counselors who also counsel in elementary schools spend 1/2 of their time doing such counseling, there were 113 (full-time equivalent) elementary counselors in Wisconsin while the state needs 1,000 elementary counselors to meet the recommended 1:500 counselor student ratio.

Said differently, Wisconsin has about 10% of the elementary counselors needed for an effective elementary level counseling program.

At the junior high level (grades 7-8-9) we find 286 counselors and 211,868 students. Using a 1:500 counselor student ratio, 423 junior high counselors would be required. This means that Wisconsin has about 67.6% of the junior high counselors needed for an effective counseling program.

In grades 10-11-12, there seems to be an abundance of counselors to go around. However, see page 11 for commentary on what these persons do and how it is viewed by the students.

INDICATORS OF PROBLEMS OF EDUCATIONAL QUALITY IN WISCONSIN

SOURCES:

A. Size Factors and Non-dollar Costs of Secondary Schools, Phase I, Wakefield, H. E., Miller, D. M., and Wolfe, R. G. University of Wisconsin, 1968.

B. Quality of Life in the United States, Wilson, J. O., Midwest Research Institute, Kansas City, 1969.

C. Some Indications of the Effectiveness of the Public Schools of Wisconsin, Wisconsin Department of Public Instruction, Madison, Wisconsin, 1969.

D. W.E.A.

E. N.E.A., 1969-R1.

1. "Quality" of education usually implies some comparison. What comparisons can be made?

The most typical comparison involves a rank ordering of the states. However, a simple ranking is misleading. The correlation* between the rankings of the states given in sources A and B above is 0.7604, which is respectably high. Yet, Wisconsin is ranked 15th in the nation by source A, and 30th by source B.

2. Why the discrepancy?

The author of source B (Mr. Wilson) argues that his variables are essentially independent: "There is very little duplication of information in the six measures. The highest correlation between any two measures is 72.7%, while eight of the fifteen correlation coefficients are less than 40%" (Page 30). However, for 50 states,

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*Spearman's "rho."

(df = 48), 0.231 is the critical value for significance at the 0.01 level, and so eleven out of fifteen correlations are significant. We, therefore, have some reasons to suspect that it is, in effect, on one or two variables (but not all six) that Wisconsin ranks 30th.*

3. What are these variables?

Source C gives the percent of selective service draftees passing military mental induction exams (VARIABLE NO. 3).

	1962	1966
% Passing in Wisconsin	91.6	95.6
% Passing in Nation	75.5	87.6
Wisconsin's Rank	16	6

Since this is not a problem area and variable 3 relates strongly (correlation is 0.727) to variable 6 (percent of population enrolled in higher education), we can eliminate variable 6 as well. Now consider variable 1, school enrollment as percent of 5 - 20 age group, <u>average</u> for 1964-66. We have more up-to-date data in source C.

		1963	1967
% That the Total School Age Children (5-17 Years) are of the Total Population in	Wisconsin	26.7	27.5
	The Nation	25.4	26.1
Wisconsin's Rank		20	16

*We will set an arbitrary cut off of 0.6 for "important" correlations for purposes of this discussion.

Indeed, according to the N.E.A. rankings of the state, Wisconsin ranks 44th on the average daily attendance as the percent of cumulative enrollment (1968-69).

This rank, therefore, comes much closer to Wisconsin's rank on source A in which Wisconsin ranked 15th.

We have thus eliminated variables 1, 3, and 6 as problem indicators for Wisconsin. However, variable 2 cannot be eliminated as a problem area. This variable (percent of 10th grade enrollment in 1963-64 who graduated in 1966) relates to the percent withdrawals data previously presented. Variable 4 (first time college enrollees, fall, 1963 as percent of high school graduates, spring, 1963) also correlates highly (0.656) with variable 6, which we have eliminated. We are left with variables 2 and 5. We can tentatively point to two problem indicators for Wisconsin:

a. Percent of high school students not graduating, and

b. Percent of college graduates not going on to professional or graduate school.

The median number of school years for Wisconsin completed by all persons 25 years or older in 1960 was 10.4, which ranks Wisconsin 31st among the 50 states. Wisconsin also ranks 26th among the states on the percent increase in the number of high school graduates from 1962-63 to 1967-68 (NEA research report 1969-R1).

Also on the variable of the average attendance as a percent of the cumulative enrollment (1968-69), Wisconsin ranks 44th among the 50 states.

4. Are there any other indicators of quality that rank Wisconsin among the states?

Yes. The following table shows the variables and the bar graph indicates Wisconsin's position among the states on these variables.

Ideally, one should perhaps be comparing indices of quality against criterion of quality independent of actual educational "performance." However, we can ask several questions of our sources.

On what variables does Wisconsin rank 30th and on what variable does it rank 15th?

Here is the correlation matrix for source B's ranking of the states showing the variables used, and their relationships.

TABLE VIII

PEARSONIAN CORRELATION COEFFICIENTS FOR SIX EDUCATIONAL OUTPUT MEASURES

	School Enrollment as Percent of 5-20 Age Group, Avg. for 1964-66	% of 10th Grade Enrollment in 1963-64 who Graduated in 1966	% Passing Army Mental Exam., 1964	First Time College Enrollees, Fall 1963 as % of H.S. Grads, Spring 1963	Professional and Graduate Students as % of Total Undergraduates, 1964	% of Population Enrolled in Higher Education, 1964
	y_1	y_2	y_3	y_4	y_5	y_6
y_1	1.000	0.537	0.678	0.240	0.310	0.549
y_2		1.000	0.661	0.162	0.219	0.571
y_3			1.000	0.361	0.179	0.727
y_4				1.000	0.180	0.656
y_5					1.000	0.313
y_6						1.000

TABLE IX

CONSTRUCT INDICATORS AND PRINCIPAL COMPONENT LOADINGS

1. Teacher Quality

+84 Average secondary school teacher's salary
+62 Percent of male teachers
+76 Supervisors per pupil
+84 Guidance counselors per pupil
-42 Pupil-teacher ratio
-64 Librarians per secondary school pupil

2. School Size

-90 Percent enrollment in small secondary schools
+89 Percent enrollment in medium-sized secondary schools
+68 Change in number of secondary schools
-11 Additional classrooms needed
+03 Excess public secondary school pupils

3. State Control

+62 Number of state-required courses
+79 Number of state-recommended courses
+82 Number of state-guided courses

4. Funding

-42 Percent state funds
-70 Percent federal funds
83 Per capita state educational expenditure
08 Percent spent on education
-45 Percent spent on public welfare
93 State educational expenditure per pupil

5. Quantitative Population Change

+84 Population Increase
+82 Population mobility
+70 Birthrate
-22 Population under 15 years
+85 Change in public secondary school pupils
+48 Percent of population under 15 years old

6. Qualitative Population Change

+39 Net migration white population
+81 Net migration non-white population
-62 Percent Negro
-51 Change in urbanization
+80 Percent urban
-08 Percent engaged in manufacturing
-09 Percent of technical and professional workers

7. Social Responsibility

+64 Percent voting
+89 Percent covered by hospital insurance
+73 Expenditure for parks
+78 Amount raised by community chest
+87 Membership in AFL-CIO

8. Educational Attainment

+89 Percent with 4 years of high school
+82 Percent with 4 years of college
+90 Median school years
-69 Percent illiterate
+71 Number of doctors
+77 Number of psychologists
+05 Number of technical and professional workers
+59 High school graduates

9. Ability to Pay

+92 Per capita income
+24 Change in per capita income
-93 Poverty
+71 Percent in non-public secondary school
-08 Change in non-public secondary school enrollment

TABLE X

(Source A, p. 45)

STRATIFICATION BASED ON THE PRINCIPAL COMPONENT

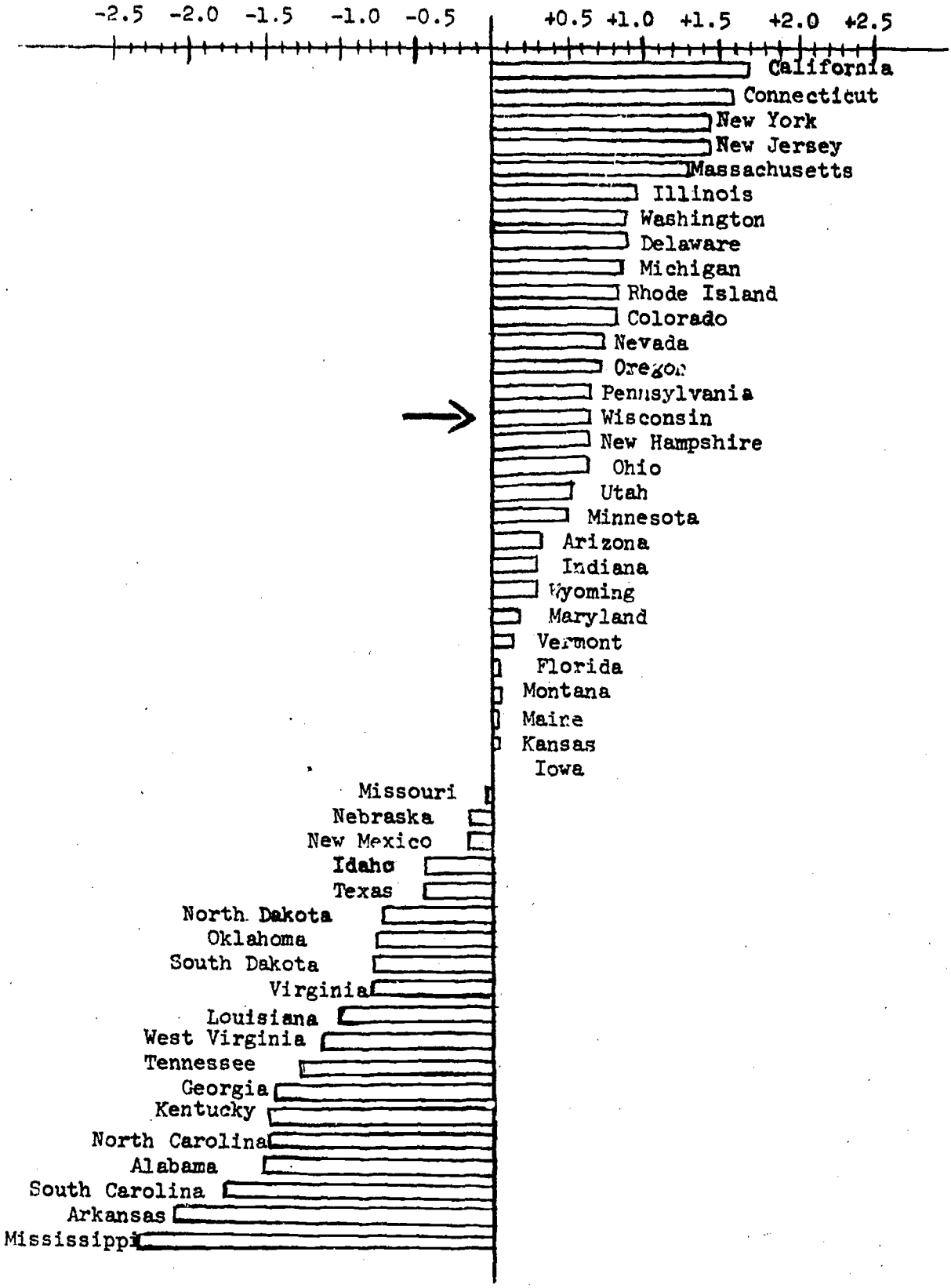
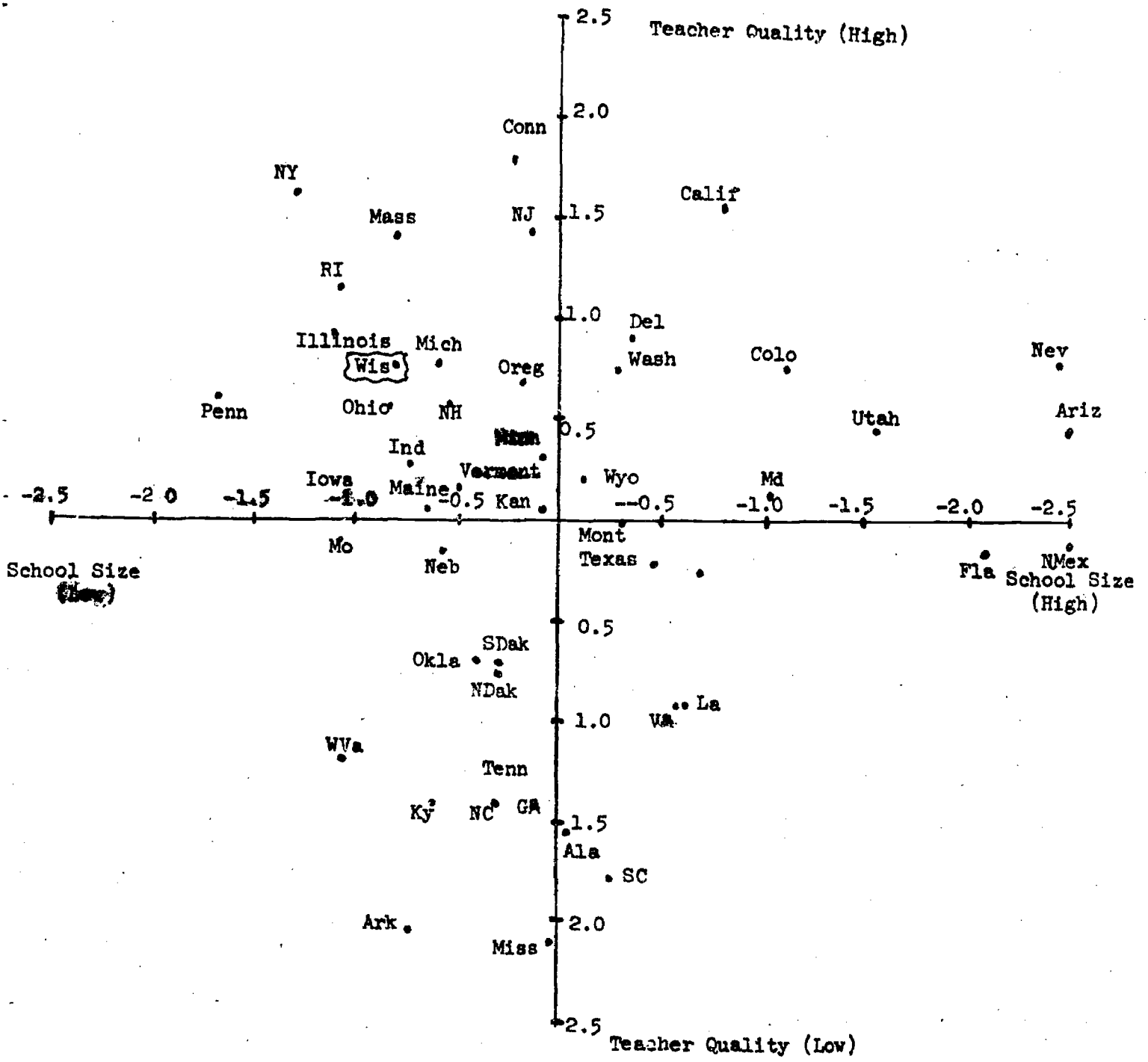


TABLE XI
(Source A, p. 46)
STRATIFICATION BASED UPON
FIRST TWO COMPONENTS



On the first two components we see that Wisconsin falls just slightly above the mean on "teacher quality" which is a third quality problem area.

Teacher quality, as measured by:

Average secondary school teacher's salary

Percent of male teachers

Supervisors per pupil

Guidance counselors per pupil

Pupil-teacher ratio

Librarians per secondary school pupil

5. This indicator is very general. Can you focus in on this "teacher quality" dimension a bit more finely?

Yes, we can. One might argue that teachers' salaries higher than national figures relate to the "holding power" of Wisconsin on its teachers.

If we compare the difference between Wisconsin and national average salaries for secondary school teachers, we find a sharp break at 1963-64. Here Wisconsin begins falling far below the national average. One year later (1964-65) is the very point at which the percent withdrawal rate begins to increase, and has continued increasing ever since.* (It should be emphasized that a variable such as salary schedule is meant to be only an indicator of educa-

1958-59	+115
59-60	+192
60-61	+192
61-62	+179
62-63	+183
63-64	+ 09
64-65	+ 32
65-66	- 11
66-67	- 95
67-68	- 35

*WEA Report, 1968.

tional climate and quality. For example, it may be that a state with a higher teacher salary schedule values the teacher more and is perhaps more likely to allocate resources to deal with educational problems, etc).

However, we can make some interpretations of the graph in Figure 14. If we break the time axis into the period for which percent withdrawals were decreasing (1959-64) we find that secondary teacher salaries were also declining in that period (the correlation between withdrawals and salaries was 0.7702). As the salary schedule drops below national figures, the correlation (for the period 1964-1968) becomes -0.6689. We can hypothesize that national average is a critical point in relation to percent withdrawals. Perhaps this point represents the point at which teachers are lured away from Wisconsin.

In addition to this result we also have the results that "Wisconsin continues to rank fifth in average salaries for total instructional staff, but ranks [a low] sixth for classroom teachers within the seven state geographical area..... (page 5, WEA); Wisconsin's average instructional staff salary is $211 below the average for the middle states . . . (page 6, WEA);" and that, "although classroom teachers' salaries have increased at a faster pace than some public school personnel, they have not kept pace with the increases in salaries of principals and superintendents (page 9)."

"Actual purchasing power of a married teacher's average salary, after federal taxes, has increased at the average annual rate of $47.41 from 1939 through 1967 based on the value of the 1935-39

SECONDARY SCHOOL TEACHERS' SALARIES
AND SCHOOL WITHDRAWALS IN WISCONSIN (1959-1968)

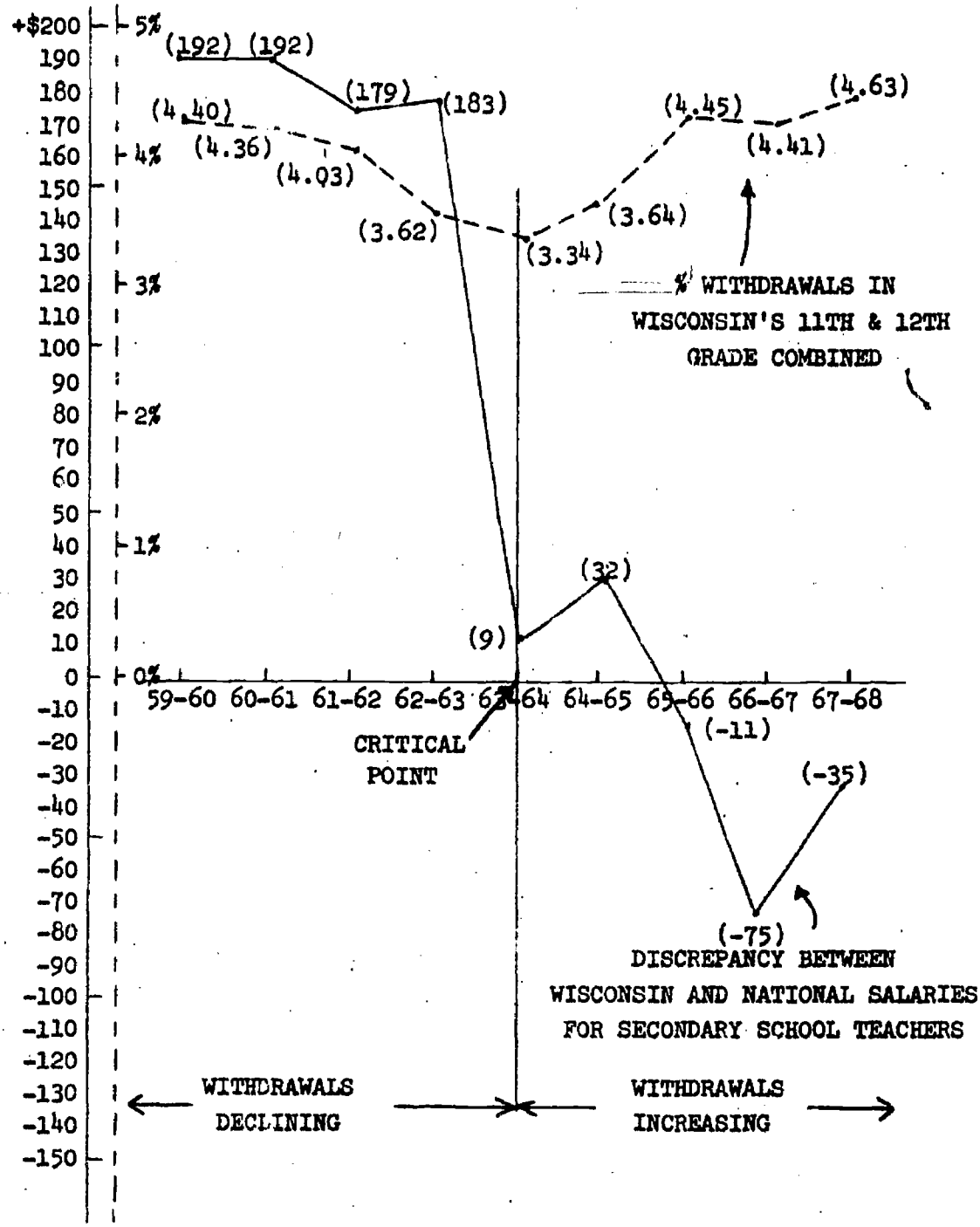


FIGURE 14. As Wisconsin's secondary teachers' salaries have fallen below national averages, dropouts in the eleventh and twelfth grades have increased.

dollar. Since 1960 the purchasing power has increased $79.03 annually" (WEA, page 32, underlining added).

6. Is there a difference in the distribution of male and female teachers in Wisconsin over grade levels?

Yes.

We know that (in Wisconsin) the early grades are essentially "a woman's world," and that the elementary teacher is considerably older than her secondary school male counterpart. The Wisconsin Educational Association's research bulletin (66-J) indicates that:

> The typical Wisconsin elementary teacher is a woman, 41.7 years old, married and has 1.7 children. She has a bachelor's degree, has 14.7 years total experience and has been teaching in her present position for 7.9 years.
>
> The typical Wisconsin secondary teacher is a man, 34.7 years old, married and has 2.4 children. He has a bachelor's degree, has 9.5 years total experience ans has been teaching in his present position for 6.8 years. (p.4)

In general, then, (in Wisconsin) the secondary school teacher is a man, younger, and has more children than his female elementary school counterpart.

7. Can you be more specific about "educational quality"? For example, can you relate this difference in male and female teachers to an educational problem?

Yes. In 1967-68 the summary of Title I ESEA's Evaluation for the Milwaukee Public Schools indicated that in elementary, junior high, and secondary school teachers' perception of areas of greatest need,

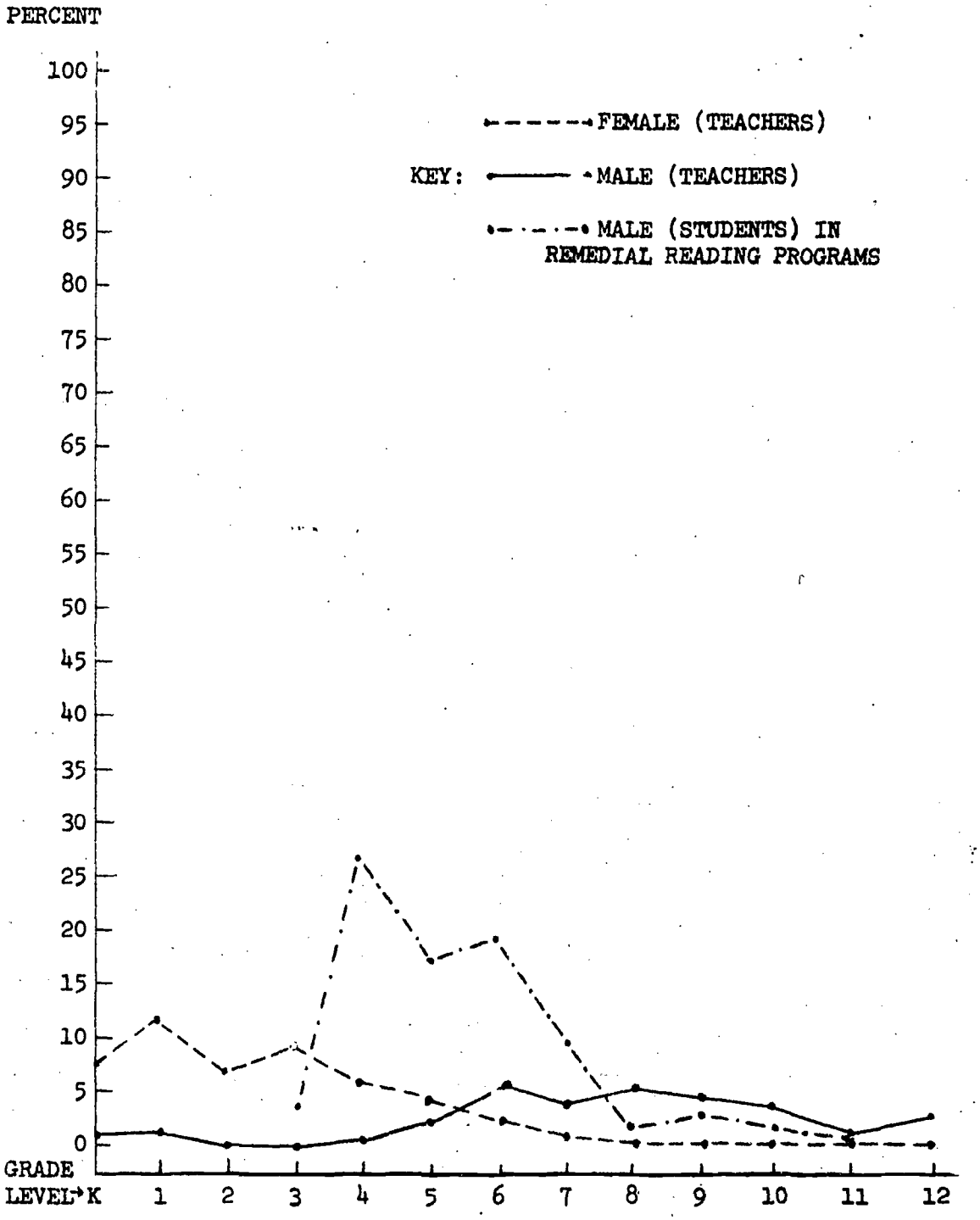


FIGURE 15. Distribution of male and female teachers in Wisconsin by grade level as related to remedial reading problem (identification by teachers).

reading ranked first for elementary and junior high teachers and third for high school teachers.

Consider the following table which relates the percentage of male students referred to remedial reading clinics in Milwaukee by grade level.

GRADES	% MALE REMEDIAL READING PROBLEMS
3	72.60
4	56.96
5	56.62
6	51.39
7	59.12
8	60.60

We can combine this data with the previously plotted distributions of male and female teachers.

Let us zero in on the distributions for which data is available at the time of this writing.* Notice in Figure 15 that the distribution of male pupils in remedial reading programs is declining as the distribution of female teachers is increasing. For grades 4 to 8, the correlation between the two declines is 0.9395. At the same time the percent of male teachers is increasing. This suggests that one possible

*Data is only suggestive at this point. See section of this report on educational technology in Wisconsin.

cause for the high proportion of male reading problems is the high proportion of female teachers in the lower grades.

This result can be interpreted in several ways:

a. We know that in Japan, where most elementary teachers are male, most remedial reading problems are female.

b. We know that there are physiological differences between the sexes in activity level and reactivity to stimulation which appear at birth and are consistent over time.

c. We can hypothesize that males may be considerably impaired educationally by the sex differential in teachers.

8. Does this preponderance of males referred for remedial re s pertain to other school problems as well?

Yes. For example, in CESA 13, (K-12) 413 females and 882 males were referred to CESA 13's pupil services. The tables on the next page give a breakdown of the reasons for referral.

9. How does this finding relate to educational needs in Wisconsin?

One variable loading highly on a factor of teacher quality in the Wakefield, Miller, Wolfe study (Source A) was the percent of male teachers (loading +62).

This finding can be combined with the facts that:

a. Actual teacher salaries in secondary school are higher than elementary school salaries; this fact is due to the differential requirement of the masters degree for secondary and not for elementary school teachers. (N.C.A. Standards). It is enough to override the differential in experiences between secondary and elementary school teachers.*

b. Student-teacher ratios in secondary school are significantly (statistically) lower than for elementary school.

---

*In 1966-67 secondary salaries were $583 more than elementary; in 1967-68 $505 higher. The elementary teacher has an average experience of 14.7 years as compared to 9.5 years for secondary education.

These can be interpreted as the differential allocation of resources in Wisconsin between secondary and elementary school--we are in effect putting more weight in secondary school.

10. Is Wisconsin's relative ability to support education low compared to the United States average?

"Wisconsin's relative ability ranks above the United States average in three of the six indicators in Table XXII." (page 25, WEA)

A more extensive table is presented below.

TABLE XII

WISCONSIN'S RELATIVE ABILITY TO SUPPORT EDUCATION*

	Wisconsin's Rank Among the States
Total personal income (1967)	13
Per capita personal income (1967)	18
Per capita personal income as percent of national average (1967)	18
Personal income per child in average daily membership (1967)	12
Net effective buying income per household (1967)	19
Percent of households with cash income of $10,000 or more in 1967	19

*From NEA Research Report 1969-R1.

In a technological age, capital outlay expenditures may provide one index of change. We asked the question, "What source of funding, federal, state, or local, related to percent increases in capital outlay expenditures?" The graph on the following page indicates the high positive relationship to federal and negative relationship to state and local percent increases in aid.

TABLE XIII

FREQUENCY OF REASONS FOR PUPIL REFERRAL BY GRADE AND BY SEX

REASON	GRADE														SEX		TOTAL
	K	1	2	3	4	5	6	7	8	9	10	11	12	SpEd	F	M	
Classroom behavior	48	26	45	41	44	48	49	31	32	18	21	16	2	10	103	312	415
Community behavior	2	5	0	0	2	3	3	5	8	5	5	10	1	2	15	36	51
Academic achievement	58	73	78	66	67	63	43	50	33	39	31	30	15	49	187	508	695
Reading problem	1	26	28	28	19	19	19	7	8	22	8	10	7	1	51	152	203
Attendance	1	1	3	0	6	4	6	6	4	3	10	11	6	2	30	33	63
Motivation	6	14	19	15	16	18	15	15	9	9	12	14	9	0	42	129	171
Peer relationship	13	4	12	15	21	7	19	11	23	14	11	4	5	2	52	109	161
Educational-vocational information	2	0	2	1	0	0	0	0	3	0	1	2	5	8	10	14	24
Test interpretation	6	1	4	2	0	0	3	2	0	0	0	0	0	0	5	13	18
Other	37	41	27	39	22	18	41	34	29	18	20	17	17	45	169	236	405

TABLE XIV

FREQUENCY OF MAJOR DIFFICULTIES INTERFERING

WITH PUPIL SCHOOL ADJUSTMENT BY GRADE AND SEX

CATEGORY	GRADE														SEX		TOTAL
	K	1	2	3	4	5	6	7	8	9	10	11	12	SpEd	F	M	
1) Intellectual ability	44	35	38	26	14	20	18	14	16	19	5	9	4	81	107	243	350
2) Reading ability	5	23	31	26	28	32	21	12	10	21	9	14	7	17	54	203	257
3) Physical development or adjustment	21	21	15	18	12	10	7	8	4	3	2	1	4	14	42	99	141
4) Emotional development or adjustment	59	59	79	66	64	61	55	48	41	31	33	32	24	47	220	484	704
5) Social development or adjustment	52	35	48	40	48	56	40	36	38	27	27	25	17	33	171	362	533
6) Relationship with teacher	7	12	9	18	25	16	15	20	9	7	5	4	1	5	36	116	152
7) Relationship with parent	22	22	26	16	36	31	19	30	16	13	25	20	17	9	72	211	283
8) Total school climate	4	7	10	11	10	14	14	10	11	12	9	3	2	11	19	96	115
9) General home conditions	24	21	43	29	31	33	29	28	24	15	11	21	13	18	114	239	353
10) Other	12	11	13	8	11	12	4	11	3	8	12	10	6	6	33	84	117

TABLE XV

CORRELATION MATRIX
CAPITAL OUTLAY AND FUNDING SOURCES
(% INCREASES, 1959-1968)

	% FEDERAL	% STATE	% LOCAL
% CAPITAL OUTLAY	+0.7535	-0.4089	-0.6629

TABLE XVI

CORRELATION MATRIX
BETWEEN SOURCES OF FUNDING
(% INCREASES, 1959-1968)

	% FEDERAL	% STATE	% LOCAL
FEDERAL	—	-0.0104	-0.2904
STATE		—	+0.1591
LOCAL			—

9. Given the trend in gross operating costs (page 57), are state aids in Wisconsin also increasing?

We have information on what percent state aids are of local school costs in Wisconsin, and we can compare this to national levels of state aids.

TABLE XVII

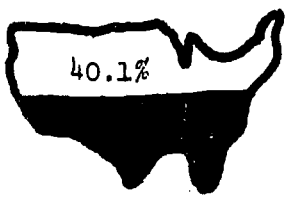
PERCENT THAT STATE AIDS ARE OF LOCAL SCHOOL COSTS

1963-64

WISCONSIN

RANK 38

UNITED STATES

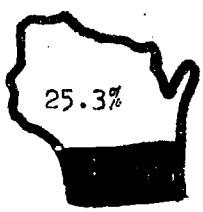


WISCONSIN DROPPED IN RANK BY 3 PLACES FROM 1963-64 TO 1966-67

THE NATIONAL LEVEL OF STATE AIDS INCREASED BY 0.2% WHILE WISCONSIN'S LEVEL DECREASED BY 0.2%

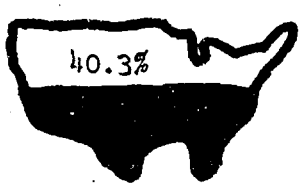
1967-68

WISCONSIN



RANK 42

UNITED STATES



Source: NEA Ranking of the States, 1964 & 1968.

11. Are state aid allocations based upon the best available formula?

This is a question that needs a good deal of research. However, for purposes of investigation, we can look at Milwaukee which has about ½ of the school children in Wisconsin. Table ___ presents four different concepts of equalizing formulas and the calculations below* show how these formulas would affect the amount of state aids for Milwaukee.

"Fixed-unit equalizing: (using richest large district)

Aid= 125, 740 x $719 - .0125 x 4,350, 087,300
Aid= $90,407,060 - $54,376,091
Aid= $46,030,969

Percentage equalizing:
(using state median for 1967-68)

Aid= 125,740, x $593 - $ 54,376,091
Aid= $74,563,820 - $54 376,091
Aid= $20,187,729

Percentage equalizing:

Aid= (1 - .70* x 34,596/28,909) x $72,444,518
Aid= (1 - .70 x 1.19) x $72,444,518
Aid= .167 x $72,444.518
Aid= $12,098,235 *(assuming the state share at 30%)

Wisconsin Equalizing:

Aid= (1 - 34,596/39,000) x $72,444,518
Aid= (1 - .887) x 72,444,518
Aid= $8,186,231

Frohreich equalizing

Aid= (1 - .70 x 34,596/28,909) x (1.1* x 72,444,518)
Aid= .167, x $79,688,970
Aid= $13,128,058

*(using 1.1 as need index)

It can be seen that the Wisconsin formulat yields the lowest amount of aids and it can all be attributed to the fact that the state formula does not assure an acceptable minimum program."

It should be pointed out that the weighting factor in the Frohreich formula is based upon a needs assessment. An identified need then would be the undertaking of a research program to find a method for determining this need index.

West Allis was selected as the richest district with an enrollment of over 10,000 as the "large" criteria.

TABLE XVIII

State Support Equalizing Formulas

Fixed-Unit Equalizing (Strayer-Haig)	Percentage Equalizing
$A_i = N_i u - r Y_i$ A_i = subsidy to the ith district N_i = number of pupils in the ith district u = dollar value of the foundation program r = mandatory local tax rate Y_i = property tax base of the ith district $r = N_1 u / Y_1$ N and Y refer to the number of pupils and tax base in the richest district of the state.	$A_i = (1 - x \cdot v_i/y) E_i$ A_i = grant to ith district x = arbitrary constnat normally having a value between 0 and 1 y_i = assessed valuation per pupil in the ith district y = assessed valuation per pupil in the state E_i = school expenditure in the ith district The constant x, represents approximately the total local share of school support.
Wisconsin's Equalizing	**Frohreich's Equalizing 32 (composite weighted)**
$A_i = (1 - y_i/y) E_i$ y_i = equalized valuation per pupil in the ith district y = guaranteed valuation per pupil set by legislation E_i = school expenditure in the ith district A_i = grant to the ith district y is not the average valuation per pupil in the state. In 67-68 the amount was set at 39,000 and the state average was $28,909. This is equivalent to reducing x in the percentage equalizing formula.	$A_i = (1 - x. v_i/y) w_i E_i$ A_i = grant to the ith district x = arbitrary constant normally having a value between 0 and 1 y_i = assessed valuation per pupil in the ith district y = average assessed valuation in the state w_i = A composite index value which indicates need E_i = school expenditure in the ith district The constant x, represents approximately the total local share of school support.

[32] Lloyd E. Frohreich, "Effects of State Allocation and Hypothetical Percentage Equalizing Formulae on Financial Equalization and Effort of Selected Classifications of Indiana School Corporations" (Unpublished PhD dissertation, Purdue University, 1969), Chapter.V.

FOREIGN LANGUAGES

AND

CAPITAL OUTLAY EXPENDITURES

TEACHERS

SOURCE: 1962 Study, Wisconsin State Department of Public Instruction

1. What kind of preparation do our teachers of modern foreign languages have?

Based upon a 94% return of questionnaires received from 703 private and public school teachers of modern foreign languages, 56% of all modern foreign language teachers are teaching with a minor or less, and only 23% have attended a NDEA Summer Language Institute.

The 1962 study concludes that:

a. A majority of modern foreign language teachers had had little or no direct experience with the latest teaching techniques.

b. The audio-lingual proficiency of well over half of the modern foreign language teachers is probably minimal or less. The fact that only about half of all modern foreign language teachers have ever been in any foreign country would seem to provide further evidence of limited exposure to the foreign language and the culture of the people who speak it.

2. Are enrollments in foreign language courses increasing?

Yes.

	Grades 7 and 8	Senior High School
1957-58	683	1,636
1968-69	18,840	16,103

3. Is the supply of teachers meeting the enrollment needs?

No. Volume 5, Number 1 of Voice of the Wisconsin Foreign Language Teacher (1965), concludes that from 1960 to 1964:

1. the supply of language teachers has doubled.
2. the number of foreign language pupils has tripled.

4. Is there still a critical need in the area of special equipment for modern foreign language teaching?

Yes. An NDEA, Title III study (1968) found that the following items were considered critical needs in schools:

Equipment Item	Is a Great Need In Sr. HS	Jr. HS	El.Sch.	Not a Great Need
a. language laboratory	32%	29%	15%	24%
b. typewriter with specialized keyboard (i.e., mathematics, foreign language, primary type, etc.)	32%	21%	25%	22%
c. science lab furniture	21%	38%	24%	17%
d. science lab equipment	26%	36%	32%	6%
e. science demonstration equipment	22%	32%	40%	5%
f. mathematics models and demonstration equipment	28%	32%	31%	10%
g. facilities to implement individualized instruction	38%	32%	25%	4%
h. information storage-retrieval facilities	39%	28%	21%	13%
i. reading (tachistoscopes) controlled readers, pacers, etc.)	21%	28%	37%	15%

The results tend to refute the argument that the schools have been saturated with specialized equipment. More than three-fourths of the respondents indicated that there was still 'a great need' for every type of equipment listed at one level or another. In four equipment categories the 'great need' response registered at 90% or higher . . . A few of the items which show a high level of variance would seem to warrant further comment.

+ The language laboratory drew the heaviest response as being not a great need (24%); nevertheless, 61% of the responses indicated that it was still a great need at the junior and senior high school levels.

+ Science laboratory furniture was listed as a great need, especially at the junior high school level. Science laboratory equipment was considered a great need at all levels, but was indicated as being most severely needed in the elementary and junior high school; only 6% of the responses indicated that science equipment was not a great need. Similarly, science demonstration equipment for the elementary school received the highest ranking of any item on the entire matrix. The heavy indication of need for science equipment is especially significant. Ninety-four percent of the responses indicated great needs remaining for science laboratory equipment and 95% of the responses indicated great remaining needs for science demonstration equipment.

+ Ninety percent of the responses indicated great remaining needs for mathematics models and demonstration equipment.

+ The item which received the heaviest overall emphasis was facilities to implement individualized instruction. Significantly, the emphasis of this item was greatest at the senior high school level, next greatest at the junior high school level. Similarly, heavy emphasis was placed upon the need for information storage-retrieval facilities at the senior high school. All of this would seem to indicate administrative sensitivity to the recent trends toward curricular and administrative innovations such as flexible scheduling, ungraded course work, individualized instruction, etc.

+ The item entitled reading equipment, tachistoscopes, controlled readers, pacers, etc. received heaviest emphasis at the elementary school level, and, overall, received a rating of 85%; this despite the fact that Title I of ESEA has been heavily utilized in the area of remedial reading.

In summary it might be said that, in the opinion of the chief school administrators of the state, THERE REMAINS A GREAT NEED FOR SPECIALIZED EQUIPMENT IN ALL THE TARGET SUBJECT AREAS: GREATEST NEEDS EXIST IN SCIENCE AND MATHEMATICS AND FOR THE IMPLEMENTATION OF INDIVIDUALIZED INSTRUCTION AT THE SECONDARY LEVEL.

SCHOOL LIBRARIES

SOURCES:*

A. Status of School Libraries in Wisconsin, Little, Robert D., Wisconsin Library Bulletin, 1967.

B. "American Library Association Standards and the North Central Association of College Standards," from Library Manpower, Ohio Department of Education, 1968.

1. Do staffing patterns meet minimum Wisconsin standards as determined by Wisconsin State Department of Public Instruction guidelines?

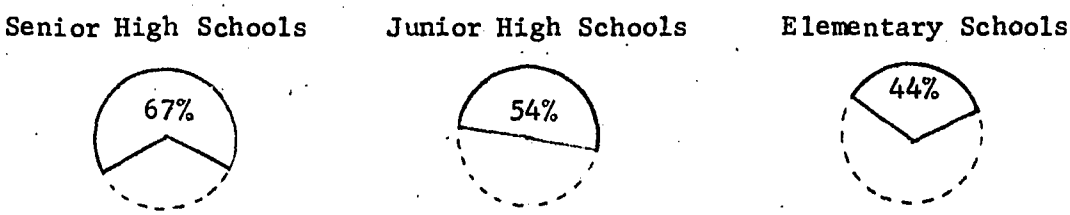
No.

	SENIOR H.S.	JUNIOR H.S.	ELEMENTARY
Minimum number needed to meet state standards	498	211	525
Present number employed by districts	478	144	242
Shortage	20	67	283

2. Are per pupil expenditures for books adequate?

No.

Schools with Centralized Libraries Evaluating Per Pupil Expenditures for Books as Adequate



*A study just being completed by the WSDPI will eventually provide us with more precise information on every school building in the state.

3. What about per pupil expenditures for audio-visual materials?

Not adequate.

Schools with Audio-visual Materials in the Library Evaluating Expenditures as Adequate

Senior High Schools

Junior High Schools

Elementary Schools

4. Perhaps we should look at the actual collection of books and their recency of publication instead of focusing on expenditures.

School Libraries with Collections Meeting At Least Minimum State Standards

Senior High Schools

Junior High Schools

Elementary Schools

Evaluation of Recency of Copyright of Collection

	SENIOR HIGHS	JUNIOR HIGHS	ELEMENTARIES
Excellent	19%	33%	24%
Average	70%	63%	66%
Inadequate	11%	4%	10%

5. Periodicals are an important resource of the school library. What standards does the Wisconsin State Department of Public Instruction recommend?

K-8 Schools:	50 Titles
Junior High Schools:	75 Titles
High Schools:	120 Titles

6. Do schools in Wisconsin meet these minimum requirements?

	ELEMENTARY	JUNIOR HIGH	SENIOR HIGH
% Meeting Minimum Requirements	4%	18%	12%

7. Libraries are beginning to function as instructional materials centers to provide "software" for multi-media instruction. How adequately do Wisconsin's school libraries fulfill this function?

Evaluation of Filmstrip Collections

	SENIOR HIGHS	JUNIOR HIGHS	ELEMENTARIES
Advanced	10%	5%	7%
Basic*	38%	32%	40%
Inadequate	52%	63%	53%

*For a collection of filmstrips to be classified basic it had to contain one filmstrip for each student enrolled the preceding year. For it to be classified advanced it had to contain at least one and one-half filmstrips for each student enrolled the preceding year.

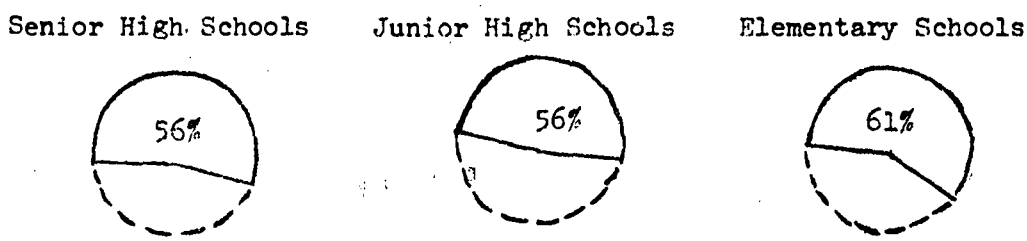
Evaluation of Record Collections

	SENIOR HIGHS	JUNIOR HIGHS	ELEMENTARIES
Advanced	5%	1%	6%
Basic*	32%	22%	38%
Inadequate	63%	77%	56%

To summarize for this question, source A concludes that:

One of the most talked-about changes in the school library field has been the development of instructional materials centers in which all types of resources--print and audio-visual--are combined to provide the student with the most appropriate learning materials. At present the American Association of School Librarians and the Department of Audio-visual Instruction of the National Education Association are jointly developing standards for the personnel, materials collections, facilities and equipment needed in school media centers. Schools participating in the ESEA Title II program in Wisconsin were asked if their audio-visual materials were cataloged and processed as part of the Library or instructional materials center. The results show that a majority of schools with centralized libraries have already moved, at least in theory, towards the combining of all learning resources in a media center.

Percentage of Schools with Centralized Libraries in Which Audio-visual and Print Resources are Housed Together



*Record collections had to include 100 records plus two per teaching station to be classified as basic. Those collections having at least 300 records plus three per teaching station were classified as advanced.

Most Wisconsin schools do not yet have collections of books, periodicals, other printed materials, filmstrips, or records adequate to meet the demands on them by the instructional programs in the modern school. Some, especially at the elementary level, have not even started to provide the needed facilities, staff or materials. A majority, however, have realized their weaknesses and have begun to develop programs to acquire the needed materials. Although federal funds will assist in improving the situation, the expenditure of larger amounts of local funds will be necessary to build adequate collections. In the future, schools will need to budget at least 3 percent of the average per pupil cost per year for printed resources and another 3 percent of the average per pupil cost per year for audio-visual materials. When this is done, schools will begin to develop the collections demanded by today's students. (page 288, source A)

EDUCATIONAL TECHNOLOGY IN WISCONSIN SCHOOLS

The Wisconsin State Department of Public Instruction report to the Kellet Commission (p.130) began with the following statement of rationale for its section on educational technology:

> Modern day philosophers have observed that our society can attribute much of its progress and achievement to the fact that man is a tool-using, instrument-using creature. The advantages accruing from skilled use of tools are easily observable when we reflect on advances made within the large sectors of our society, i.e., business, industry, agriculture, medicine, the armed forces, etc.
>
> The education sector, though slower to act, has also turned to a variety of tools and instruments to increase the efficiency and the effectiveness of communication, a prime ingredient of learning and teaching. Particularly in the last ten years, influenced markedly by federal funding, schools throughout the nation have been turning with ever-increasing enthusiasm and acceleration to the technology of instruction to help with the huge tasks imposed by swelling enrollments and the "knowledge explosion." Films, filmstrips, recorded materials and their attendant "hardware" have been selected and purchased in sizable and ever-increasing quantities. Televised instruction, programmed learning approaches, even computer-assisted instruction have more recently been pressed into service.
>
> Nationally, expenditures for equipment, materials, and services to implement this trend rose dramatically from $97.6 million in 1962 to $442 million in 1968.
>
> Average expenditures per pupil for audiovisual instruction increased during that period from $1.96 to $4.00. As Finn has put it in Studies in the Growth of Instructional Technology: American education, considered as a culture is transition, is now beginning the take-off stage into a high-order, high-energy culture, and it is the first educational system in the world to reach this stage.
>
> That Wisconsin schools have followed the general pattern of this trend will be revealed by data used later in this discussion and by a comment carried in a bulletin issued by this department last year: If, indeed, we are on the brink of a revolution in education, it must be labeled that of a revolution of media.

> Some idea of the proportions of the commitment to instructional technology among Wisconsin schools can be obtained from the following bits of data:
>
> When this department's NDEA Division made its annual report to the U.S. Office of Education last year, it reported that 65.7% of all funds distributed under Title III for that year were expended for audiovisual equipment and materials. The results of a poll taken among Wisconsin school administrators this past year to measure the impact of our NDEA program over the last nine years found 65% of the administrators claiming that audiovisual materials and services had been a major factor in improving instruction.

Indeed, in general for Wisconsin from 1959-68, percent increases in capital outlay expenditures have correlated with percent increases in federal aid (0.7535), with state aid (-0.4089), and with local school property taxes (-0.6629). These figures indicate that one large import of federal aid to education has been to release state and local dollars for the "revolution of media." To continue the quote:

> Further indications of appetite for instructional technology were disclosed in another recent DPI study. In spite of the fact that Wisconsin schools have had dependable access to only two educational television outlets in Wisconsin (Madison and Milwaukee) plus several others either of a commercial or border-state nature, the study told us that Wisconsin schools have equipped themselves with 2,771 T-V receivers and over 60 video tape recorders. Forty schools have installed closed-circuit television facilities, and few schools remain which have not tooled up with sound film projectors, filmstrip and slide projectors, tape recorders, overhead projectors and their related materials.

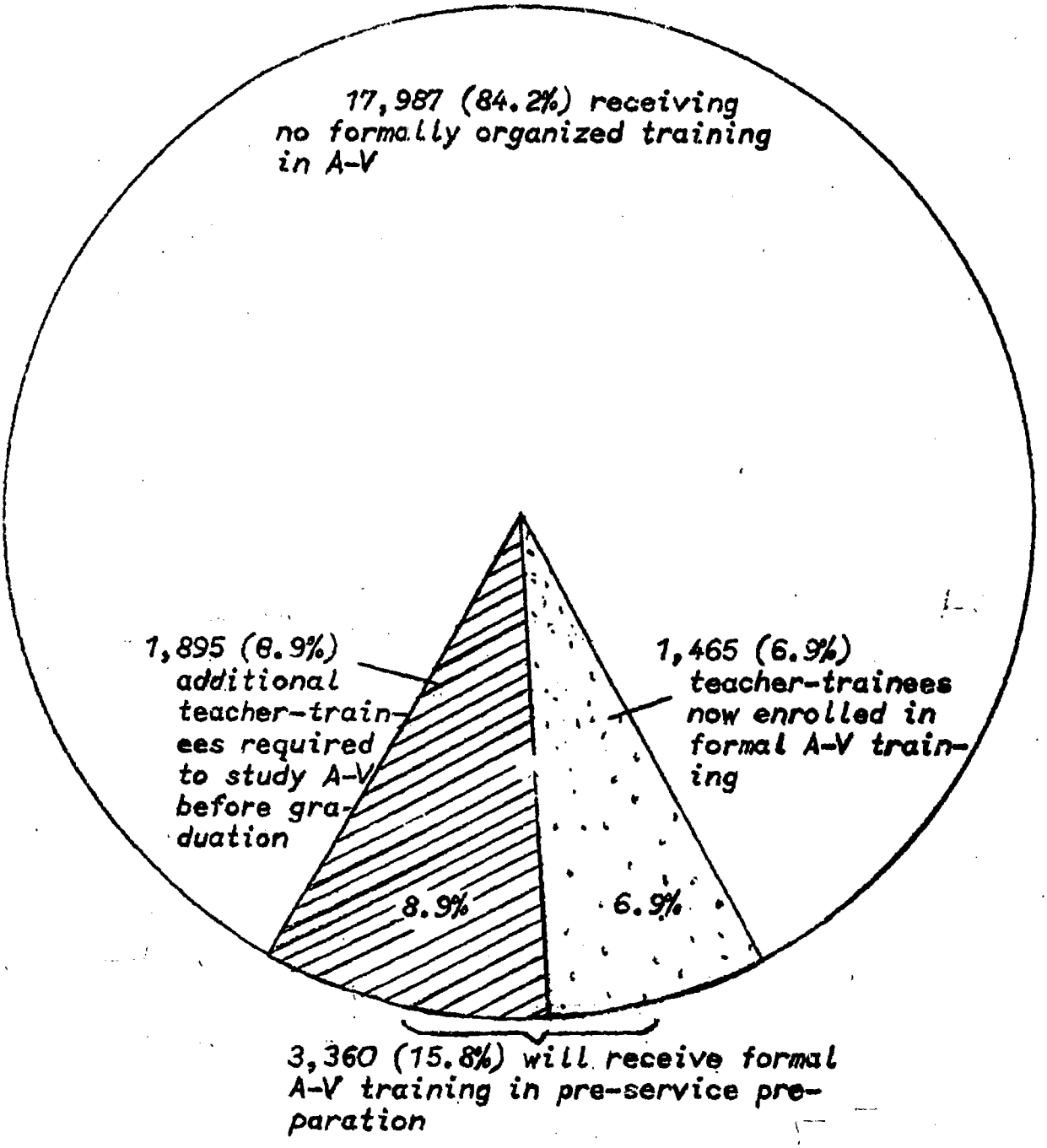
This leads us to our first question.

1. Are Wisconsin's teachers being trained to utilize all this equipment and materials?

The following graph indicates the alarming state of teacher preparation in Wisconsin relative to the pace of technological change.

TABLE XIX

WISCONSIN TEACHER-TRAINEES EXPOSED TO FORMALLY ORGANIZED EXPERIENCES AIMED PRINCIPALLY AT DEVELOPING COMPETENCY WITH AUDIO-VISUAL EQUIPMENT AND MATERIALS



21,347 PREPARING TO TEACH, ENROLLED IN FIFTY-TWO WISCONSIN COLLEGES

2. Is the problem simply that teachers are not being trained to use equipment?

No. In the school libraries section of this report we showed that schools are critically underequipped in the area of multi-media software. We also showed in this section that schools are massively equipped in the area of hardware. While teacher training in multi-media is a critical need, another facet of that need involves the design and utilization of software. In a 1964 Wisconsin State Department of Public Instruction survey of 330 administrators in Wisconsin, most administrators strongly agreed that an audiovisual director in a school should:

a. have training in learning theory supportive to audiovisual instruction, and possess a valid teaching certificate based on a minimum of a four year degree,

b. have credentials that show formal training in curriculum, and

c. assist staff with the selection of software and hardware, and conduct training workshops for teaching staff.

When this result is combined with Wayne Stamm's finding that over 50% of teachers in two Wisconsin schools did not feel confident in their ability to use audio-visual methods, we see evidence for the demand for training in the use of hardware, the design and use of software, and the integration of audio-visual methods with existing pedagogy.

3. Are some Wisconsin teacher-training schools doing a better job in this area than others?

Yes.

	Percent of Teacher Trainees Getting AV Preparation
State Colleges	27.5%
Universities	3.5%
County Colleges	2.8%
Total Enrollment	15.8%

One indicator of the capability for a State Department of Public Instruction to provide recommendations concerning educational problems is the ready availability of data for answering questions. Data is most readily available in this technological age when it is in a form that lends itself to the application of automated technology. How does Wisconsin compare to other states in the completeness and utility of its information system?

The study by Wakefield, Miller, and Wolfe (source A) ranked the states on three variables. A summary of their methodology and major findings is given below.

> To encourage states to collect and store educational data, Congress included in the National Defense Education Act (NDEA) of 1958 a section providing funds to state departments of education for improving their statistical services (Section 1009, Title X). Upon approval of a proposal for collecting such data, a state could receive up to $50,000 in each fiscal year, provided the federal funds were matched. Figure 3-C-1 is found in State Plans for Improving Statistical Services, U.S. Department of Health, Education and Welfare, OE-20028, Bulletin 1961, No. 16. It indicates the dollars allocated for educational automation in fiscal year 1960 and thus the relative degrees to which the state departments of education were at that time moving toward the storage of educational data. States which are high on the list may be expected

to have rather complete data. Iowa and Florida are high on the list and this corresponds to the fact that they both now have extensive data banks.

There is, therefore, a clear need for the WSDPI to construct a management information system for policy decision-making which is based on a cost-benefit analysis.

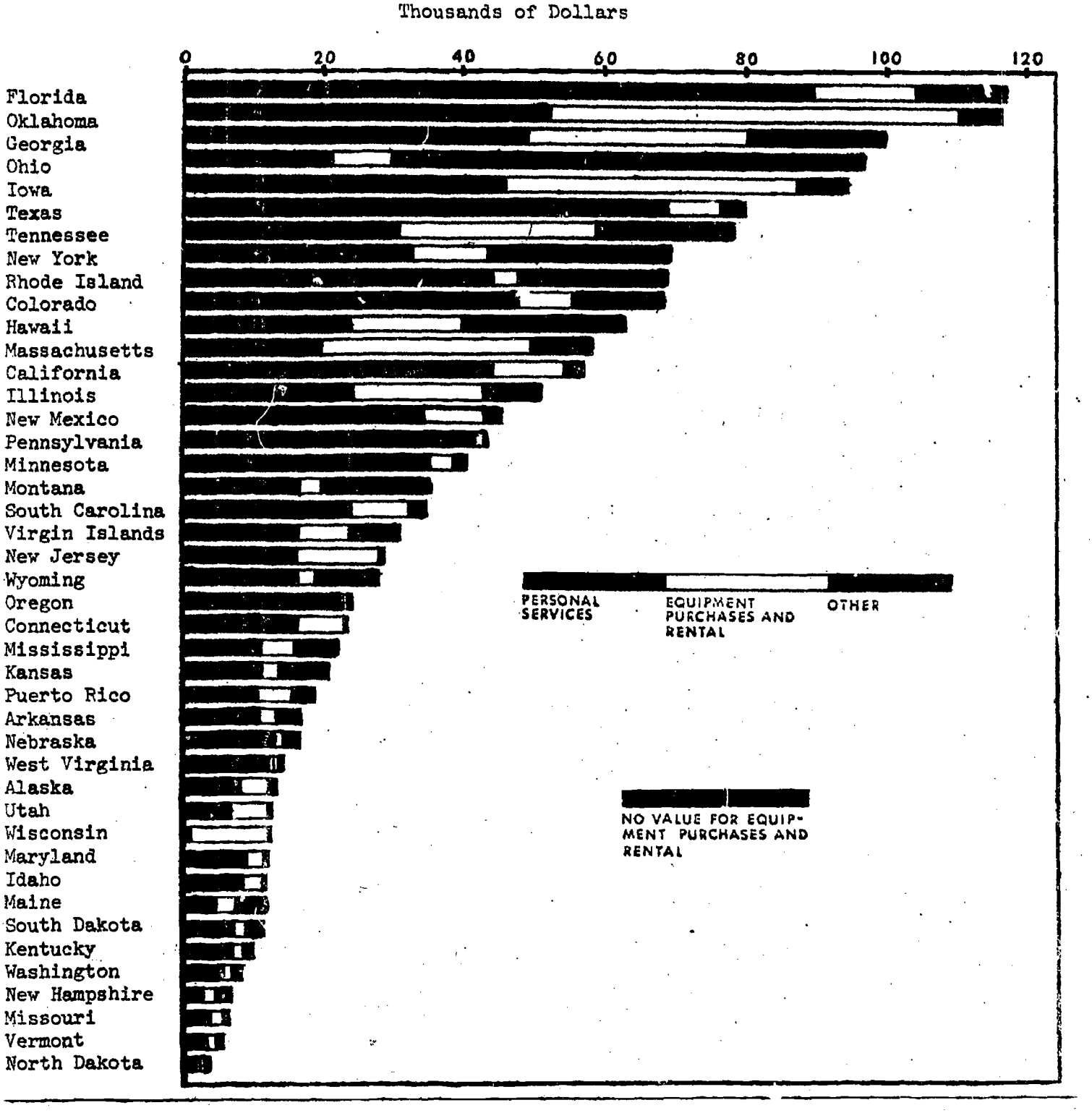


FIGURE 17. Amount of expenditures under section 1009, Title X, by State and object: Fiscal year 1960.

MIGRANTS

Wisconsin has several seasonal farm ventures (fruits, vegetables, cranberries) which annually attract an influx of migrant farm laborers. Typically of Mexican-American descent, migrant families include an estimated 1,050 pre-kindergarten children, 210 kindergarteners, 1,470 children of elementary school age, 1,470 adolescents of high school age, and 800 adults. In 1968 the Wisconsin Department of Public Instruction expended $308,961.00 in educational programming for migrants servicing about 47% of these children. Services were extended to nearly all of the kindergarten and elementary-aged children while only 17% of the adolescents and 19% of the pre-school-aged children received such services. No record of basic adult education programming is in evidence.

Although it is probable that the adolescents and adults are perceived as too busy contributing to family income (on the average the lowest of any major minority group) to participate in educational venture, educational levels among migrants are low.

In view of the enormous acculumation of data on the importance of pre-school stimulation to cognitive development, questions must be raised about the lack of effort to program effectively for the pre-school-aged group.

In migrant programming, then, Wisconsin has an apparent need to more than double current expenditures: 1) to consider extending services to the pre-school-aged group when dollars spent may yield a greater return, and 2) to emphasize basic adult educational programming leading to high school equivalency.

THE
ACHIEVEMENT AND INTELLIGENCE
OF WISCONSIN'S CHILDREN

A. The State excluding Milwaukee.

Technical Notes

Source: Wisconsin State Testing Service data (1967-68).

Procedure: Percentile ranks on national norms were used. The Henmond-Nelson test was used for the I.Q. measure. Two achievement tests were used, the SCAT which has three scales (verbal [V], quantitative [Q], and total [T]), and the STEP which has six scales (reading [R], writing [W], listening [L], social studies [SS], science [Sc], and mathematics [M]).

Validity of Data: Hays (1963) shows, although only a non-random sample of Wisconsin Test Service data was used, that the first observation of a sample is an unbiased estimate of the population parameter. This estimate is made more efficient (close to the value of the parameter) in the data presented by using grade level within school as the unit of analysis. Means of scores are therefore our basic data point, and the population of means of a sample has considerably less variation than the sample points.

A total sample of 6,723 students was used for the data presented on the next page. Caution was exercised by considering Milwaukee separately using other data sources.

This leads us to our first set of questions.

1. How do Wisconsin's children stand on IQ relative to national norms?

The table below presents percentile ranks on national norms for grades three to eight.

TABLE XX

IQ And Grade Level
For Wisconsin's Children

Grade Level	IQ (Percentile On National Norms)
3	69.7
4	67.5
5	65.2
6	70.3
7	57.1
8	61.8

2. Is there a declining trend in this data as grade level increases?

Yes. See Figure 18 on the following page. For every unit increase in grade level, Wisconsin's children drop an average of 1.9 I.Q. percentile points in relation to national figures.

3. How do Wisconsin's children stand on achievement relative to national norms?

Table XX presents data on percentile ranks of Wisconsin's children on achievement tests (SCAT and STEP tests).

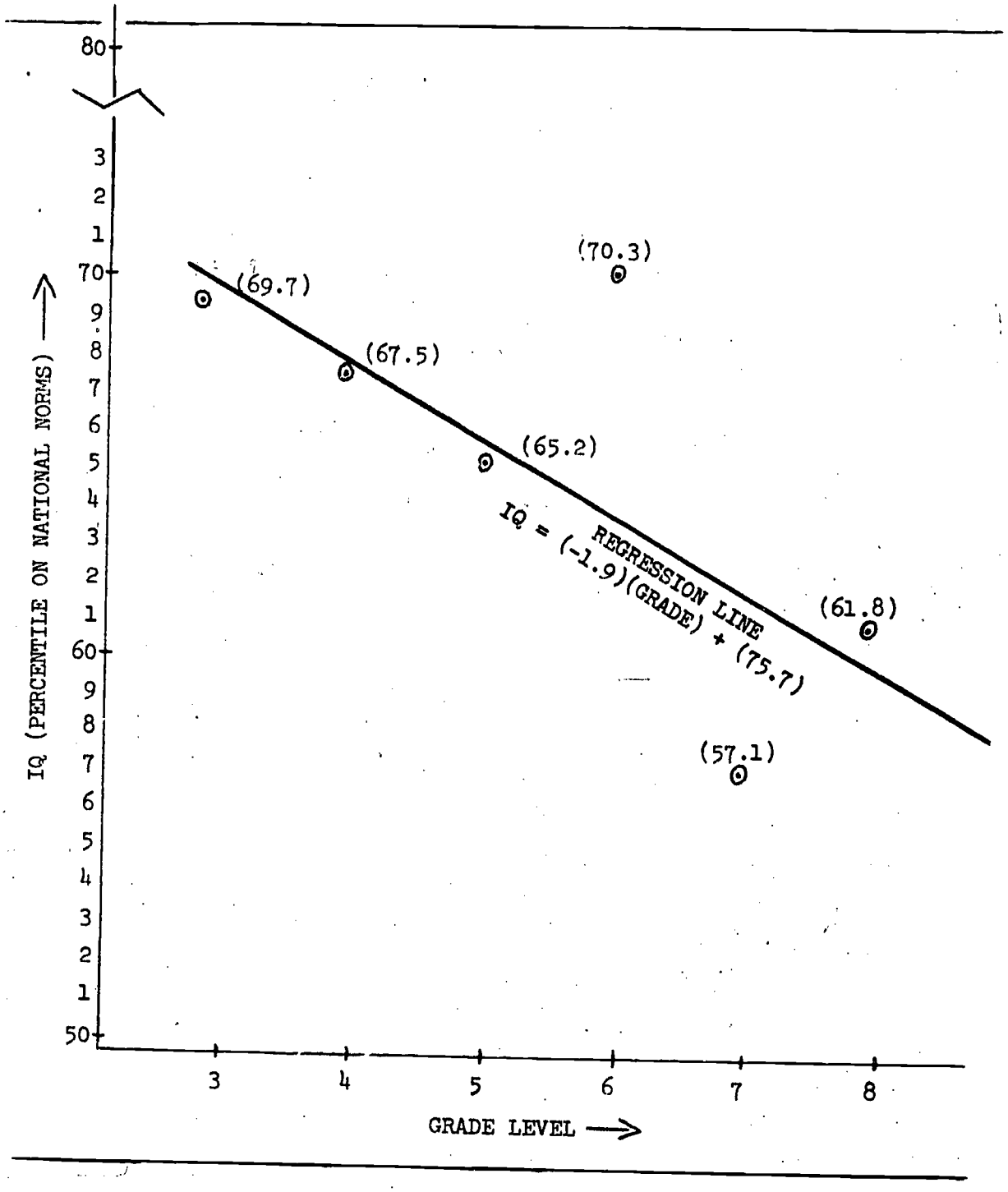


FIGURE 18. Regression line showing decreasing IQ percentile with increasing grade level for Wisconsin's children.

TABLE XXI

ACHIEVEMENT AND INTELLIGENCE DATA
FOR WISCONSIN CHILDREN
(PERCENTILE RANKINGS
ON NATIONAL NORMS)

GRADE LEVEL	IQ	ACHIEVEMENT								
		SCAT			STEP					
		Verbal	Quantitative	Total	Reading	Writing	Listening	S.Studies	Science	Math
4	67.5	57.7	62.0	61.4	52.4	51.0	52.8	48.4	54.6	51.7
5	65.2	69.8	91.5	83.1	51.5	50.0	55.7	52.1	50.9	53.6
6	70.3	59.0	58.9	60.7	47.0	62.1	57.0	50.6	48.3	56.2
7	57.1	80.1	74.1	80.4	57.0	53.8	57.5	61.0	56.2	55.9
8	61.8	55.1	45.7	48.7	49.9	49.0	44.8	47.4	51.1	49.4

It would be reasonable to consider IQ as the input to each grade level and consider achievement as the output. We can then set the expectation that Wisconsin children ought to stand at least as well on achievement tests as they do on IQ scores. The percentile discrepancy between IQ and achievement could then be taken as an index of need.

First, we notice that across all grades, only eight achievement percentiles out of forty-five in Table are above the corresponding grade-level IQ percentiles. Over 80% of the entries in this table indicate a need to bring output (achievement) up to input (I.Q.) levels.

Second, we notice that only one column of the achievement data shows the same declining trend over grade level as the IQ data; reading this column is on the STEP test.*

Third, if we look at the areas of reading (R), writing (W), science (Sc), and mathematics (M), we can compute a table of the discrepancies between IQ and achievement percentiles.

---

*The rank order correlation coefficient between reading achievement percentiles and grade level is -0.533, which is suggestive of deteriorating reading scores as grades go higher.

TABLE XXII

Percentile Discrepancies Between
Achievement and IQ Over Grade Levels

Grade Level	R	W	Sc	M	Row Average
4	15.1	16.5	12.9	15.8	15.1
5	13.7	15.2	14.3	11.6	13.7
6	23.3	8.2	22.0	14.1	16.9
7	0.1	3.3	0.9	1.2	1.4
8	11.9	12.8	10.7	12.4	12.0
Column Average	12.8	11.2	12.2	11.0	

From Table XXII, several observations can be made:

1. The area of greatest discrepancy between ability and achievement is "reading."
2. The seventh grade level has the least overall discrepancy--note, too, that it has the lowest expectancy level.
3. Sixth grade has the greatest overall discrepancy.

B. Milwaukee

Sources:
1. School Aids for the Disadvantaged by Michael H. Harden (1968).
2. ESEA Title I evaluation report on achievement (in press).

Background: Title I schools must be treated differently from non-title I schools in the presentation of achievement data. Some of the reasons for this are that

1. In title I schools the elementary grades comprise 20,000 students, 83% of whom are non-white; the secondary grades comprise 15,800 students, 55% of whom are non-white.
2. In 1967-68, the dropout rate in the four years of high school for title I schools was 13%, as compared to 5% for non-title I schools. [The 5% figure is comparable to the rest of the state.]
3. There are strong differences in the reasons given for dropping out.

TABLE XXIII

PERCENT OF TOTAL POPULATION OF DROPOUTS GIVING REASONS FOR DROPPING OUT.

	ESEA High Schools	Non-ESEA High Schools
Pregnancy	15%	3%
Work (18 or Over)	26%	10%
Transfer to Milwaukee Vocational School	21%	14%

1. How do Milwaukee's children stand on achievement according to grade level?

The following two tables answer this question.

TABLE XXIV

ACHIEVEMENT IN MILWAUKEE SCHOOLS
GRADES 4, 6, AND 8.

	Minimum Grade Level Equivalent Expected by National Norms	Title I ESEA Schools	Non-ESEA Schools
Grade 4:			
Language	4.20	2.95	3.85
Arithmetic	4.20	3.20	3.95
Composite	4.20	3.00	3.90
Grade 6:			
Language	6.10	4.55	5.70
Arithmetic	6.10	4.70	5.60
Composite	6.10	4.60	5.65
Grade 8:			
Language	8.05	6.00	7.60
Arithmetic	8.05	6.00	7.50
Composite	8.05	6.00	7.75

There is clearly a problem for both ESEA and non-ESEA schools in Milwaukee. Both schools lag behind expected national norms. However, ESEA schools show an increasing lag over grade levels, where-

as non-ESEA schools show a stable log over grade levels. This trend is shown below.

TABLE XXV

LAG OF ACHIEVEMENT OF MILWAUKEE CHILDREN FROM NATIONAL NORMS

	Lag From National Norms (In Years)	
Grade Level	ESEA	Non-ESEA
4	1.2	0.3
6	1.5	0.5
8	2.0	0.3

The Table on the next page shows percentile rank on national norms for achievement. (The typical [median] student or school in the nation would score in the 50th percentile.)

TABLE XXVI

Achievement In Milwaukee Schools
According To Percentiles On National Norms:
Grades 10 and 12.

	ESEA Schools	Non-ESEA Schools
Grade 10:		
Science	20	47
Reading	20	41
Mathematics	21	39
Grade 12:		
Science	32	56
Reading	30	49
Mathematics	33	52
Soc. Studies	31	51

ESEA schools clearly lag behind both national norms and non-ESEA schools. There is an average 22 percentile lag between ESEA and non-ESEA schools in 10th grade and the lag increases to 25 percentile points in twelfth grade.

Harden (1968) stated that a possible reason for this lag is that, "many of the educationally disadvantaged in Wisconsin have southern backgrounds. The poor educational opportunity afforded them in the south is clearly a contribution to Wisconsin's problem." (p. 10) However, this statement does not receive total support from Keith Wunrow (1961) in a study that indicated that recent immigrants to Milwaukee from the south score as well on achievement tests than

residents who have been in Milwaukee for six years or longer.

2. We have been discussing learning achievement. What is the status of the Milwaukee school child in the early grades in learning rates?

The title I evaluation report on achievement concludes that, "highly significant differences were found between the learning rates per year in achievement (before entry to title I) between Title I and non-Title I pupils across grade levels ($p < .0001$); the assumption is met that units of gain decrease as grade level increases. Highly significant differences were also found between Titl I and non-Title I pupils on reading."

3. Does the non-Title I child maintain initial gains?

No. The report concludes that, "in effect the non-Title I child seemed to lose initial gains in achievement over time as a result of not being in the special compensatory program. In grade 4, both Title I and non-Title I children had identical learning rates, although the pretest learning rates for the non-Title I pupil was markedly above that of the Title I pupil and above mean expected gain . . . .A similar pattern of achievement was also evident in grade 6." The same pattern also pertains to learning rates on arithmetic.

4. Is present compensatory education programming adequate?

No. While no significant differences were found in learning rates between Title I and non-Title I pupils, during the Title I program's

operation, "the Title I child did not show exceptional progress in any of the categories; however, the non-Title I child in the Title I school showed less progress than the Title I child in several categories." It seems, then, that the Title I program was merely arresting deterioration in learning rates more effectively than the regular school program.

FISCAL SECTION:
COST-BENEFIT ANALYSIS

A. School District Reorganization in Rural Areas of Wisconsin.

Source: "Long-term study of educational effectiveness of newly formed centralized school districts in rural areas: Part one (1962); Part two (1964)." by Burton W. Kreitlow

1. Is there any evidence that school district reorganization results in higher academic achievement for students?

Yes and no. Ninth grade girls in reorganized districts do significantly better than ninth grade girls in non-reorganized districts in reading, arithmetic (fundamentals and problems), literature, and science (p. 28).

However, the opposite is true for ninth grade boys. Boys in reorganized districts do significantly worse than ninth grade boys in non-reorganized districts in reading, vocabulary, english, literature, geography, and spelling (p. 29).

2. Does this pattern of differences in achievement extend to other variables?

Yes. The California Personality Test results show the same pattern on factors of psychological health. These are listed below.

TABLE XXVII

PERSONALITY DIFFERENCES OF STUDENTS IN REORGANIZED AND NON-REORGANIZED SCHOOLS.

FACTOR	% ITEMS FAVORING REORGANIZATION	
	BOYS	GIRLS
Sense of Personal Worth	16.7%	66.7%
Feeling of Belonging	8.3%	41.7%

The results on the preceding page pertain to the student's feelings about himself. Results reflecting the student's feelings toward society are given by the areas of social standards (agreement with societal norms of right and wrong), social skills, and community relations. These are presented below.

TABLE XXVIII

Differences in Attitude Toward Society of Students in Reorganized and Non-reorganized Schools.

FACTOR	% ITEMS FAVORING REORGANIZATION	
	BOYS	GIRLS
Social Standards	33.3%	50.0%
Social Skills	33.3%	41.7%
Community Relations	33.3%	50.0%

B. Expenditures and Benefits.

1. Is there any overall relationship between per-pupil expenditures in a school and overall academic achievement?

No. The correlation between per-pupil expenditures and academic achievement is effectively zero. (For boys the correlation is 0.0367, for girls it is 0.1490).

2. Are there any differences in the relationship between expenditures and achievement for reorganized versus non-reorganized school districts?

Yes. See the Table on the following page.

TABLE XXIX
CORRELATION BETWEEN EXPENDITURES PER PUPIL AND ACADEMIC ACHIEVEMENT

	Boys	Girls	Total
Reorganized	-0.7914	-0.3957	-0.7335
Non-Reorganized	+0.5016	+0.2541	+0.4007

While caution must be exercised in drawing conclusions, these results raise some very disturbing questions. They seem to imply that the dollar investment is paying off positively (about a 16% return) for non-reorganized districts while paying off negatively (about 53% loss) for reorganized districts.

3. Are there any differences in the relationship between academic achievement and expenditures between schools with lower per-pupil expenditures versus higher per-pupil expenditures?

Yes. See the table below.

TABLE XXX
CORRELATION BETWEEN PER PUPIL EXPENDITURE AND ACADEMIC ACHIEVEMENT

Expenditure	Boys	Girls
$111 - $146	0.5428	0.5686
$150 - $162	0.1646	-0.1932

In the lower expenditure category, there seems to be more returns per dollar investment.

4. Where are the dollars going in reorganized districts?

The list below presents some statistically significant differences between reorganized and non-reorganized schools that relate to expenditure categories.

TABLE XXXI

REORGANIZED DISTRICTS HAVE MORE

Teaching Aids And Materials	Slide projectors, more projectors, record players, basic science equipment, subject matter materials.
Teacher Qualifications	1. Teachers that have more training beyond a high school education. 2. Music specialists: art specialists, specialists for the handicapped, physical education specialists, and guidance specialists.
Facilities	1. Central heating facilities 2. Telephones 3. Lunch programs 4. Accident insurance provided

C. General Fiscal Considerations.

1. What is the dropout problem in Wisconsin costing the state?

Michael H. Harder's 1968 report to the Task Force on local government finance and organization says that,

> In a recent publication urging businesses to invest in the training and education of disadvantaged children, the American Management Association explained that the typical high school dropout represents a social cost of $100,000 in reduced earnings, smaller tax payments, welfare and unemployment benefits, increased delinquency,

crime, more illness, and disease and reduced purchasing power (p. 4).

While this figure may be high, we do know that a reasonable estimate of decreased lifetime earning capacity is $25,000 per year of high school. In 1967-68 there were 3,618 withdrawals from 12th grade and 2,868 withdrawals from 11th grade in Wisconsin. Assuming a 2% state tax rate, this means a tax loss of $4,677,000 to the state of Wisconsin as a result of last year's dropouts from 11th and 12th grade alone.

2. What source of funding seems most likely to control the dropout problem in Wisconsin?

Figure 5 (p. 20) shows that school property tax trends are negatively related to the withdrawal problem (correlation= -0.5447). Perhaps the most sensitive variable which can be assumed to control the dropout problem is local rather than state or federal * (See page 21 of this report).

3. Does the dropout problem relate to other fiscal factors?

Yes. The correlation between percent dropouts and percent increases in yearly gross school operating costs is 0.8157 (See pages 26 and 28).

Also, as teacher salary schedules drop below national figures, the dropout rate increases, whereas it declines during the time periods for which teacher salaries are above national figures (See pages 48 and 49).

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*This is especially true since the current state aid formula does not contain a need index.

4. Is there any relationship between trends in sources of financial aid to schools in Wisconsin?

No. The table below shows that yearly % increases in state, federal, and local support of education are uncoordinated.

TABLE XXXII

Correlation Between Trends
In Funding Sources

	% STATE INCREASES	% FEDERAL INCREASES	% SCHOOL PROPERTY TAX INCREASES
% STATE INCREASES	—	-0.0104	0.1591
% FEDERAL INCREASES		—	-0.2904
% SCHOOL PROPERTY TAX INCREASES			—

5. Isn't Wisconsin tremendously overburdened in the area of local property taxes?

On the variable of local property tax revenue as a percent of state-local property tax revenue (1966-67), Wisconsin ranks 41st of the fifty states (NEA report 1969-R1).

6. Is Wisconsin's relative ability to support education low compared to the United States average?

"Wisconsin's relative ability ranks above the United States average in three of six indicators " (page 56 of this report).

A more extensive table is given on page 56 which indicates that Wisconsin's ability to support education puts Wisconsin a high 16th among the fifty states.

7. Where are federal dollars going in education?

The correlation between capital outlay expenditures and federal expenditure increases is 0.7535, whereas for the same period the correlations for state and local expenditures is -0.4089 and -0.6629, respectively.

This might imply that one important effect of federal dollars in Wisconsin is to decrease the allocation of state and local dollars for capital outlay and to use federal dollars for this purpose.

8. Are state aids in Wisconsin rising at the same rates as aids are rising in the nation as a whole?

No. Wisconsin has dropped in rank by three places from 1963-64 to 1966-67 on the percent that state aids are of local school costs. (See page 60, this report)

9. Are state aid allocations based upon the best available formula?

One of the implications of a needs assessment study is to analyze the effectiveness of dollar allocations on the basis of alleviation of need. This plan of operation is feasible if a need index is constructed for each school district based upon criteria and standards of quality education. The Frohreich equalizing formula is a beginning toward this end. At present we are unable to answer the above question. Our inability to answer it indicates another educational need in the state of Wisconsin--the need for an information system capable of performing on-going cost-effectiveness analysis.