DOCUMENT RESUME

ED 102 786 EC 071 474

AUTHOR Christie, Lu S.; McKenzie, Hugh S.
TITLE Minimum Objectives: A Measurement System to Provide Evaluation of Special Education in Regular Classrooms.
PUB DATE 74
NOTE 33p.

EDRS PRICE MF-$0.76 HC-$1.95 PLUS POSTAGE
DESCRIPTORS *Behavioral Objectives; *Educational Accountability; Exceptional Child Education; *Handicapped Children; Intervention; Measurement Techniques; Program Evaluation; *Regular Class Placement; Sequential Learning; Skill Development; *Student Evaluation

ABSTRACT

Discussed is the use of minimum behavioral objectives to provide evaluation of special education in regular classrooms. Literature which supports the mainstreaming of moderately handicapped children is reviewed briefly. Application of the behavioral model of education on the community level is considered in terms of the basic skills which comprise essential education and the accountability of professional educators. Handicapped children are viewed as those eligible for special services involving changes in the teaching/learning environment. Five assumptions (such as the accountability of the school and community for the child's acquisition of skills) which undergird the concept of minimum objectives are explained. Suggestions are given for developing systems of minimum objectives for student progress within a school year and over a period of years. Use of intervention to accelerate rate of mastering minimum objectives is described, and its application with a 12-year-old girl deficient in math skills is explored. Pointed out is the usefulness of minimum objectives systems in determining eligibility for special education services, in evaluating the effectiveness of those services, and in determining when a child no longer requires special services. Attention is also given to the benefits of a minimum objectives system for gifted students and to the challenge of developing objectives for social behaviors. (LS)

Minimum Objectives: A Measurement System to Provide Evaluation of Special Education in Regular Classrooms

by

Lu S. Christie

and

Hugh S. McKenzie

Special Education Area
College of Education and Social Service
University of Vermont
Burlington, Vermont 05401

Spring, 1974

Minimum Objectives: A Measurement System to Provide Evaluation of Special Education in Regular Classrooms

The concept of mainstreaming moderately handicapped children has provided an attractive alternative to expansion of special classes. There is a growing body of literature which supports this approach to special education. For example, Darrah (1967) and Dunn (1968) have questioned the efficacy of educating certain handicapped children in special classes. They argue that a regular class approach to providing special services could have several advantages. Adelman (1971) and Lovitt (1967) have offered arguments which support diagnosis of the developmental difficulties of children based on the presenting behaviors and learning environment of the individual child. A given child is not compared to all other children, placed in a broad category and labeled. Nor do these authors assume that special class is appropriate for all children with developmental difficulties.

Perhaps the greatest support for mainstreaming comes from Deno (1970) and her conceptualization of special education as developmental capital employed to make education more effective for all children. Moreover, Lilly's (1971) conceptualization of special education as a training based model offers support for mainstreaming skilled special education teachers as well as their students, as special educators shift roles to become trainers of regular classroom teachers.

A training based model of special education with regular class placement for all but the profoundly handicapped provided a means for increasing special education services in the state of Vermont. Since 1968, the consulting teacher program has been developed jointly by the Division of Special Educational and Pupil Personnel Services of the Vermont State Department of Education and the Special Education Area at the University of Vermont (McKenzie, Egner, Knight, Perelman, Schneider, and Garvin, 1970 and McKenzie, 1972). Learning specialists called consulting teachers are employed by local school districts, training regular classroom teachers to effectively manage the education of learning disabled, mildly retarded and emotionally disturbed children. In-service teacher training is provided through consultation, workshops, and graduate courses (Christie, McKenzie, Burdett, 1972). All three levels of teacher training incorporate direct, measurable service to eligible children, through implementation of a behavioral model of education.

One crucial aspect of the behavioral model of education is the specification of instructional objectives. These objectives must specify behavior which will result from instruction, the conditions under which the behaviors will occur, and the criteria establishing levels at which the behaviors are judged to be acceptable. The ultimate application of the behavioral model of education would involve, for example, a rural community defining the set of behaviors any graduate from its elementary school would possess. The conditions under which these behaviors would occur and the criteria

indicating acceptable levels of behaviors would also be specified. Taxpayers, parents, children, as well as professional educators, would participate in the development of these instructional objectives. These objectives would represent what that community felt to be essential education.

What is essential education? It may be thought of on two levels, in terms of both the long range and immediate needs of the learner. Martin (1972) speaks of higher level, common goals for all learners, with the definitive goal being a "productive, satisfying life as a member of society." As sub-goals, he cites appropriate employment, the need for social activities, communication skills, and the ability to enjoy leisure time. Jones (1972) urges the development of educational programs which stem from both the current and long term needs of children.

Essential education may be thought of as those skills which are required of every child, in order for him to function happily and productively in his school and in the wider community. Basic skills in the areas of language, arithmetic, and social interaction provide the foundation for all future learning. Unremediated deficits in these skills apparently lead to failure, as the learner confronts more and more complex tasks.

An additional specification would involve a time limitation in which these essential, minimum objectives would be achieved for each child. For example, for an elementary school, a given community might determine that after six years of schooling, each and every child could demonstrate a minimum set of behaviors at criteria

levels under the specified conditions. The professional educators operating the school would then be accountable for every child achieving these objectives. Moreover, during each grade (first, second, and so on), and at various points during each grade, each child would be expected to have developed sets of behavior which would be enabling objectives for terminal instructional objectives to be achieved by the end of six years. In this way, all members of the community, including professional educators, could examine each and every child's progress at any point in time in his schooling. For example, at the middle of the second grade year the child would be expected to possess certain skills in reading, writing, spelling, arithmetic, and so on. The educators employed by the community would be accountable for each and every child demonstrating the behaviors of the enabling objectives appropriate to his number of years in school.

In the behavioral model of education, the professional educator addresses himself to the objectives most immediately applicable to a given child. If the child's actual performance does not meet the minimal expected objectives for all children at the child's point in his schooling, this signals the educator that added special services are warranted for the child. This involves adding to the teaching/learning environment and/or rearranging it until the child accelerates his rate of acquiring the behaviors which comprise the minimal instructional objectives. Thus, the educator is accountable for arranging the teaching/learning environment so that every child will achieve the minimum objectives pertinent to his number of years of instruction.

In traditional special education, the handicapped child has been defined as, for example, ". . .that child who deviates from the average or normal child in mental, physical, or social characteristics to such an extent that he requires a modification of school practices, or special educational services, in order to develop to his maximum capacity (Kirk, 1962, pp. 4-5)." In this traditional definition of a handicapped child, a child is compared to his peers to see if he deviates from the average or "normal" child, as well as from some estimate of potential, to an extent warranting adding special services to more fully promote his educational growth. Typically, deviations from normal and from potential are determined with standardized tests.

However, under a behavioral model of education, there is no comparison with peers, nor any estimate of potential. These procedures and concepts simply do not have a place in the behavioral model of education. Under this model, there is no such thing as a handicapped child in the traditional sense of the term. However, there may be children who are eligible for special added services because the levels of their current behavior are less than the levels of the minimum objectives applicable to the child with his years of schooling. Such a difference in levels of actual behaviors and expected behaviors set the occasion, then, for changing the teaching/learning environment so that behaviors will reach expected levels. Once a child has shown a measured discrepancy from the minimum learning rate, an entry level measure of his current skills is taken, an instructional objective is specified based on the sequence of minimum objectives, and a teaching/learning pro-

cedure is implemented and evaluated daily (Fox, Egner, Paolucci, Perelman, and McKenzie, 1973).

In summary, under a behavioral model of education, there are only two kinds of children: those requiring added special services because they are not achieving minimum objectives and those who, because their behaviors meet minimum objectives, do not require special services. A classroom teacher also receives special services when he cannot appropriately, and on his own, rearrange the teaching/learning environment for a child who demonstrates that he is not achieving minimum instructional objectives.

Simply stated, minimum objectives are instructional objectives which are sequenced and paired with a time criterion. They are developed and implemented by the local school system. Minimum objectives have to date dealt with essential skills in language, arithmetic and social interactions.

The concept of minimum objectives is based on several interrelated assumptions.

As has been noted, it is assumed that every child who is able to enter a public school should acquire the minimum objectives in that school within the specified amount of time. Many children may learn far more than the basic skills specified by minimum objectives, but no child should learn less. The child with learning deficits and the gifted child who acquires new skills with minimal instruction must ultimately survive in the same society. Both children must learn to read, to compute, and to interact and communicate with other people. This being the case, the only useful assumption for educators is that every child has the capacity to

acquire minimum skills. To assume otherwise is to impose an arbitrary ceiling on learning, a ceiling potentially as damaging to the "gifted" or "normal" child as to the child who is "retarded." We have nothing to lose when we assume adequate capacity, and we may greatly increase the probability of gains (Boyer, W.H. and Walsh, P.A., 1971).

It is further assumed that it is possible for a school to effect the acquisition of minimum objectives for every child. Data on the hundreds of effective educational programs that have been based on the principles of applied behavior analysis and individualized instruction lend credence to the assumption that the necessary educational technology to achieve this goal does, in fact, exist. (e.g., Journal of Applied Behavior Analysis, 1968-present; Christie, Egner, and Lates, 1972; Hanley, 1970; Gallagher, 1972; and Rouse and Farb, 1974) Handicapped children's learning rates can and have been accelerated. If such a technology did not exist, minimum objectives systems would simply be another in a long line of punishments for the public schools. It would be pointless to measure a child's learning rate if nothing could be done to change it!

Finally, there is the assumption that minimum objectives should be developed in the local school, with the approval of the local community. Obviously, there is considerable cost in time and money involved in such a process. Why not an elegant, comprehensive set of minimum objectives for the entire country?

First of all, the process of deriving, specifying, and, finally, assuming accountability for a set of minimum objectives is an extremely valuable one for a school staff. Teachers say they rarely have an opportunity to interact with each other on such a professional level, with such rewarding results. Also, it appears at this time that no set or partial set of minimum objectives derived thus far has been so clearly drawn that revision was not needed. Minimum objectives should be subject to at least yearly revision, up-dating, and refinement. Thirdly, there are the very practical problems associated with imposing instructional objectives on a classroom teacher. While most teachers would agree that all children should be able to recite the alphabet by the time they leave sixth grade, the exact time when that skill should be mastered may be a matter for considerable disagreement. One can only guess at the problems in store for the person who is given the task of imposing this objective on a first grade teacher who firmly believes that no child needs to learn the alphabet until he enters third grade. When minimum objectives are arrived at and sequenced by consensus in the local school, these problems which result when teachers are made victims of an accountability system not of their own choosing (Barro, 1970; and Bhaerman, 1971).

So we have undergirding the concept of minimum objectives, these assumptions:

1. Every child has a need for and should acquire essential language, arithmetic, and social skills at a minimum rate.
2. The child's school and community are accountable for his acquisition of those skills.
3. Children who are not acquiring essential skills at the minimum rate are eligible for special services.

4. Existing technology can accelerate a child's rate of acquiring essential skills.

5. Essential skills should be incorporated in minimum objectives systems developed at the local school level.

DEVELOPING SYSTEMS OF MINIMUM OBJECTIVES

One common element in all systems developed thus far is the form in which minimum objectives are written. Bateman (1973) said recently that an instructional objective should be stated so clearly that the "woman who pumps gas at the local filling station" would be able to determine whether or not a child had mastered the skills. That criterion becomes especially meaningful when we ask for community approval of local minimum objectives. Broadly stated educational goals may be useful, such as, "All children should acquire an appreciation of literature," but they cannot serve as minimum objectives. Mager (1962) argues for objectives which can be measured. Such behaviors as "appreciation of literature" defy measurement not only by the filling station attendant, but by the classroom teacher as well.

Minimum objectives must specify the student behaviors which will result from instruction, the conditions under which these behaviors will occur, and the criteria by which these behaviors will be judged (Mager, 1962; Wheeler and Fox, 1972).

For example, a minimum arithmetic objective for second grade might be:

CONDITIONS	BEHAVIOR	CRITERIA
Given 20 subtraction problems, 2 digit numbers requiring no regrouping	the student will write the answers	within 5 minutes, making no more than 2 errors (90-100% accuracy).

It should not be difficult for two observers to measure this behavior and agree that a child has met this objective.

A second commonality in existing systems is the pairing of minimum objectives with small time segments in each school year. Typically, for each month in school, there are specified minimum objectives. Such divisions allow periodic checks of a child's rate of learning, and establish the minimum rate. It is unnecessary to wait an entire school year to check on a child's progress. Most teachers find a minimum rate graph an efficient way to monitor a child's progress in achieving minimum objectives.

(Figure 1 goes about here.)

In Figure 1, it can be seen that 40 minimum arithmetic objectives must be mastered during the school year. The school year of 180 days has been divided into ten equal segments. For each 18 day segment, a given number of objectives is specified. A child achieving at the minimum rate would have achieved mastery of 12 objectives by the end of the third 18 day segment. A child who had mastered four second grade objectives at the end of the third 18 day segment would be eligible for special help to increase his learning rate, provided the classroom teacher had exhausted her tactics.

It is also possible to plot a child's achievement of minimum objectives within a given number of school years. Figure 2 is a minimum objectives graph which would show a child's progress in reading in a school containing kindergarten through fourth grade.

(Figure 2 goes about here.)

At the present time, consulting teachers and their school districts are using several procedures to develop and implement minimum objectives. As yet, we are unable to determine which, if any, is the most efficient procedure. For example, in one school a four week summer workshop for teachers was conducted by their consulting teachers, and complete sets of minimum objectives for kindergarten through sixth grade were developed for arithmetic and language, along with measures for each objective. These are currently being implemented and refined.

In a kindergarten through fourth grade school, all teachers were involved in developing minimum objectives in reading, along with measures for each objective. Teachers at each grade level met periodically throughout the school year. Much of the actual writing of the objectives was done by graduate students after the skills were specified and agreed upon by the teachers. Measures of the objectives were written by the teachers. In other schools, individual teachers with the help of consulting teachers, are developing school year minimum objectives for their areas of responsibility.

Burdett (1972) edited the instructional objectives stated by an elementary mathematics series, decided which objectives were

minimum skills, and specified a set of minimum arithmetic objectives for kindergarten through sixth grade. This list of objectives became the starting point for minimum objectives in arithmetic for one school district. The consulting teacher asked teachers at each grade level to edit the objectives and suggest changes. In some cases objectives were discarded, others were added, and some were reworded. What emerged was a set of minimum arithmetic objectives developed in an informal way. The consulting teacher and her assistant developed pre-tests, individualized learning units, and post-tests for each of the objectives, again asking for teacher feedback on the products. Further refinement and revision will be carried out in a series of workshops.

Evaluation

It has been stated that an accelerated rate of mastering minimum objectives should be the measure of effectiveness for special services. At present we have established criteria for three learning rates which would meet the rest of effectiveness:

1. A rate which, if continued, would result in a child's mastery of all minimum objectives by the end of the year which is the last year of instruction in a given school. In Figure 3, the child's learning rate before intervention was .6, 9 months of instructional growth for 15 months of instruction. 1.0 is the minimum rate, one month of instructional growth for one month of instruction. After intervention, the learning rate was 1.28, 9 months of instructional growth for 7 months of instruction. Projecting that rate, the child could be expected to achieve all minimum objectives before the end of fourth grade.

(Figure 3)

2. A rate which results in a child's achievement of all minimum objectives specified for that year of instruction on or before the end of the present school year. In Figure 4, the child's learning rate before intervention was .33, 2 months of instructional growth for 6 months of instruction. After intervention, a learning rate of 2.3, resulted in the acquisition of 7 months of skills in only 3 months' time, placing the child back on the minimum skill level. Early intervention avoided a cumulative deficit.

(Figure 4)

3. A rate which is double that of the minimum rate, or which results in two months' instructional growth for every month of instruction. Figure 5 (see page __), shows an accumulated deficit. Such a deficit would not be allowed to occur in a minimum objectives system which stressed early intervention. Although this child has not met all minimum objectives, he has received effective service, since his learning rate is now 2.0, 12 months of instructional growth for 6 months of schooling.

(Figure 5)

The following is a brief description of an effective intervention based on minimum objectives:

Ann (Gehlbach, 1971)

Ann was a 12 year old girl in the sixth grade. She had been assigned to a special education class prior to her family's relocation in this community. She was arbitrarily placed in grade 6 with her age-maters.

In this school 131 minimum arithmetic objectives established for kindergarten through eighth grade, and a mastery test for each objective was developed. These mastery tests were used to determine Ann's entry level.

In October, the second month of sixth grade, Ann had mastered only 32 skills, placing her at second grade level. She was four years and one month deficit in arithmetic skills.

An instructional objective for the school year was established at 4.3 grade level, which would require 23 months of instructional growth for nine months of instruction, a learning rate of 2.55. A classroom aide provided individual tutoring on each minimum objective in daily half hour sessions. Three months of the teaching/learning procedure resulted in 3.1 years of growth, placing her at the 5.1 level, well above the instructional objective of 4.3. Ann's rate of learning during the three months of intervention was 10.3 times the minimum rate. If this rate of learning continued, Ann could master all of the minimum arithmetic objectives by the end of eighth grade.

(Figure 6)

Discussion

Minimum objectives systems appear to offer solutions to at least three problems associated with mainstreaming handicapped learners, namely that of determining a child's entry into, or eligibility for special education services, evaluation of the effectiveness of those services, and, finally, a means for determining when the child can exit from these services, and be successfully maintained by the regular clawsroom teacher.

The problem of determining eligibility is a complex one. The testing procedures which traditionally have been emploeyd to identify eligible children appear to offer more problems than solutions. While poor performance on standardized tests may confirm a classroom teacher's diagnosis of a learning problem, test scores are rarely helpful in determing an effective educational program for a child. Tests have often been used to screen children for special class placement. In a program which provides for special education in the regular classroom, such screening may be non-functional, and in some cases potentially harmful to the child. The resulting categorization, labelling and stigma are at best dehumanizing, and may lead to an attitude of, "What can we expect of a child like this?" (Jones, 1972). Reynolds and Balow (1972) make a plea for educators to influence children's learning, rather than to predict it, observing the limited usefulness of both the search for etiology and the prognosis for success or failure provided by standardized tests. Keogh and Becker (1973) warn that early identification and prediction of learning problems may produce a set of expectancies in teachers which would lead to

the "self-fulfilling prophecy", an effect described by Rosenthal and Jacobson (1966). They advocate observation of the child in the classroom setting, emphasizing existing competencies as they relate to desired outcomes. These arguments lend further support to the need for a way to determine a child's educational progress within his school environment. It is not a child's performance on a standardized test which renders him eligible for special educational services, but rather the discrepancy between his rate of acquiring skills and the minimum rate required of all children to achieve essential education within the usual 12 or 13 years of public schooling. Thus, a measurement of that discrepancy, including a determination of the child's current level of skills is needed. Regular measures of the child's acquisition of minimum objectives provide a measure of eligibility which:

1. takes place in the classroom setting,
2. avoids categorization, labelling and stigma,
3. measures the discrepancy between his current level of essential skills and the minimum level specified for all students who have attended school for the same length of time
4. and adds no additional, costly testing procedures to the on-going educational program.

The current emphasis on accountability in education points up the second problem in mainstreaming handicapped learners, namely that of evaluating the effectiveness of special education services. If a child's eligibility is to be determined on the basis of his current level of basic skills in his classroom environment, it clearly follows that the educational program prescribed for the child should be evaluated in the same setting.

Further, the evaluation should be based on publicly stated, agreed-upon minimum objectives for which the school, including regular and special educators, assumes accountability. These minimum objectives should take the form of a sequenced set of instructional objectives, and a minimum rate for acquiring those objectives should be established. A deficit occurs when a child's rate of learning is less than the minimum rate. Thus, his rate of mastering minimum objectives must be accelerated if a teaching/learning procedure is to be judged successful.

REcent articles in Exceptional Children support the need for such a system of evaluation, based on sequenced instructional objectives. Gallagher (1972) suggested a two year contract for special educational services, with specified, measurable objectives to be met during the two year period of time. The implication is that if a child's rate of achieving objectives is not increased by special education services, the child has not been served, and the services were ineffective. We might argue that two years is a long time to wait to determine effectiveness, but within Gallagher's model there is accountability similar to that which is required by minimum objectives.

Vergason (1973) said that "...the first element of a program of accountability is for schools to state what their objectives are and to have their success judged by how well they reach these goals (p. 368)." He further stated, "Special education cannot rely on the sympathy of legislators and others, but must produce hard data on its successes and failures."

Recently, Jones (1973) stated that, "Accountability is the by-word of the 70's (p. 631)". He said that we need a way to assess individual rates of achievement, and explained why

standardized measures fail to do this. His arguments against such tests as measures of accountability included the lack of information about skill mastery which a norm, or comparison of students provides. He also questioned the validity of tests with reliability coefficients between paralled forms of less than .90, referencing an analysis of 1649 tests which showed only seven that met that criterion (Hoepfner, Strickland, Stangel, Jansen, and Patalino, 1970).

Jones cited the need for a way to relate criterion-referenced programs to measures of gain or growth, and stated that the burden of this activity should not rest solely on teachers, but that administrators and the public need to define common and specific goals and objectives for minimum expectations. "For any given student at any point in time, we want to know whether or not his progress is fast, slow, or at the expected level (Jones, 1973, page 634)."

Thus, it would appear that several concerned special educators are calling for objectives which are agreed upon by school and community, accountability for meeting those objectives for all children, and a system for measuring rates of achieving those objectives. The success of a special educator's intervention could then be judged by it's effect on the child's rate of learning.

When is a child no longer eligible for special education services? We have said that an eligible child is one who is not acquiring essential skills at the minimum rate. The special educator then becomes accountable for accelerating his progress. In a mainstream program, the special educator shares that

accountability with the regular classroom teacher, helping her provide special education services. We have also said that an intervention can be considered effective if the child's learning rate has been accelerated. However, the special educator's accountability does not end until the child has attained the specified level of skills expected of a child with his years of schooling. When a third grade child in the third month of school has met the objectives expected of all children by the third year, third month of school, he is no longer eligible for special education, and accountability for his learning resides once more with the regular classroom teacher. Continued monthly measures of the child's rate of learning would indicate whether progress continued to be satisfactory, or further intervention necessary.

Thus, within a minimum objectives system, a child's exit from special services might be as easily effected as his entry, with decisions based on data obtained within the classroom setting.

How will systems of minimum objectives affect the education of children who achieve at or above the minimum rate; the non-eligible, non-handicapped learners?

(Figure 7)

Figure 7 depicts the progress of Joe, a child in a classroom where an individualized reading program developed for eligible children was made available to all children (Seaver, 1972). Monthly measures of Joe's achievement of minimum objectives made it possible for the teacher to monitor his progress, while

the individualized program allowed him to acquire skills at double the minimum rate. Joe received "superior" scores on the achievement tests provided for his 3-1 and 3-2 readers. He is now free to select reading materials that interest him. What might Joe's progress have been if such a program had begun when he entered kindergarten? If highly accelerated rates of learning can be brought about in handicapped learners, what can be done to free the gifted from the prescribed pace of the typical curriculum?

What are the research implications of minimum objectives? Rates of achieving minimum objectives may provide the educational researcher with a dependent variable, a stable baseline making possible the intrasubject replication so necessary for useful, believable data (Sidman, 1960). Acquisition rates in several skill areas will facilitate sophisticated multiple baseline designs as well (Baer, Wolf, Risley, 1968 and Guralnick, 1973).

While these challenges and others are interesting, perhaps the most intriguing challenge is that of developing minimum objectives for social behaviors. To date no school has accomplished this. When a child is referred to a consulting teacher, classroom teacher, the child's parents, and often the child agree upon an appropriate instructional objective, and specify a time by which it should be met. The objective, and specify a time by which it should be met. The objective is not part of a sequenced set of objectives, but is individually prescribed for that child, at that time, in that classroom.

While teachers are very adept at identifying children with discrepant social behaviors, they find specification of the

range of acceptable behaviors far more difficult. It is obvious that the child who never interacts verbally with his peers has a problem. It is also obvious that the child who verbalizes at a rate much higher than his peers is in need of help. But how much verbalizing is enough? The child who physically attacks other children daily is being too aggressive. So we want to teach a child that aggression is always bad? Do we want to teach a child unquestioning obedience? How do we balance a child's right to be alone against his need for the interpersonal skills required by group participation?

These are hard questions, and, obviously, this is only the beginning of such a list. In a world without war, prejudice, greed, and violence we might ignore these questions, feeling comfortable with the status quo. In such a world as ours, we may not be able to avoid confronting the critical issues involved in specifying minimum objectives for social behaviors.

In summary, minimum objectives provide a measurement system for eligibility for special education, and for exit from special education. Further, they provide a community-based measurement of effective, regular special education for all children. Minimum objectives may be the measure of Martin's (1972) "special education for every child."

REFERENCES

Adelman, H. The not so specific learning disability population. Exceptional Children, 1971, 37, 528-533.

Baer, D., Wolf, M., and Risley, T. Some current dimensions of applied behavior analysis. Journal of Applied Behavior Analysis, 1968, 1, 91-97.

Barro, S. M. An approach to develop accountability measures for the public schools. Phi Delta Kappan, 1970, 52, 196-205.

Bateman, B. The essentials of teaching handicapped children. Paper presented at the Special Education Conference, Vermont Education Association, Burlington, Vermont, October, 1973.

Bhaerman, R. D. Accountability: The great day of judgment. Education Technology, 1971, 11, 62-63.

Boyer, W. H. and Walsh, P. ... Innate intelligence: An insidious myth. In C. E. Pitts (Ed.) Operant Conditioning in the Classroom. New York: Thomas Y. Crowell Company, Inc., 1971.

Burdett, C. S. Minimum expected objectives and the ideal school. Unpublished manuscript, Special Education Area, College of Education, University of Vermont, 1972.

Christie, L., Egner, A., and Lates, B.J. A very special education for all children. Montpelier, Vermont: State Department of Education, Title III, ESEA, 1972.

Darrah, J. Diagnostic practices and special classes for the educable mentally retarded - a layman's critical view. Exceptional Childr 1967, 33, 523-528.

Deno, E. Special education as developmental capital. Exceptional Children, 1970, 37, 229-237.

Dunn, L.M. Special education for the mildly retarded - Is much of it justifiable? Exceptional Children. 1968, 35, 5-22.

Fox, W. L., Egner, A. E., Paolucci, P. E., Perelman, P. F. and McKenzie, H. S. An introduction to a regular classroom approach to teacher education. In E. N. Deno (Ed.) Instructional Alternatives for Exceptional Children. Arlington, Virginia: Council for Exceptional Children, 1973.

Gallagher, J. J. The special education contract for mildly handicapped children. Exceptional Children, 1972, 38, 527-535.

Gallagher, P. A. Structuring academic tasks for emotionally disturbed boys. Exceptional Children, 1972, 38, 711-720.

Gehlbach, C. An effective procedure for remediating a four year deficit in minimum arithmetic skills. Unpublished manuscript, Special Education Area, College of Education and Social Services, University of Vermont, 1974.

Guralnick, M. J. A research service model for support of handicapped children. Exceptional Children, 1973, 39, 277-282.

Hanley, E. M. Review of research involving applied behavior analysis in the classroom. Review of Educational Research, 1970, 40, 597-625.

Hoeptner, R., Strickland, G., Stangel, G., Jansen, P. and Patalino, M. CSE Elementary School Test Evaluation. Los Angeles: Center for the Study of Evaluation, UCLA, 1970.

Jones, R. L. Accountability in special education: Some problems. Exceptional Children, 1973, 39, 631-642.

Jones, R. L. Labels and stigma in special education. Exceptional Children, 1972, 38, 553-564.

Journal of Applied Behavior Analysis. Lawrence, Kansas: Society for the Experimental Analysis of Behavior, Inc., 1968-present.

Keough, B.K. and Becker, L.D. Early detection of learning problems: Questions, cautions, and guidelines. Exceptional Children, 1973, 40, 5-10.

Kirk, S.A. Educating exceptional children. Boston: Houghton-Mifflin, 1962, 4-5.

Lilly, S.M. A training based model for special education. Exceptional Children, 1971, 745-749.

Lovitt, T.C. Assessment of children with learning disabilities. Exceptional Children, 1967, 34, 233-239.

Mager, R. Preparing instructional objectives. Palo Alto: Fearon Publishers, 1962.

Martin, E.W. Individualism and behaviorism as future trends in educating handicapped children. Exceptional Children, 1972, 38, 517-527.

McKenzie, H.S. Special education and consulting teachers. In F. Clark, D. Evans, and L. Hammerlynk (Eds.) Implementing behavioral programs for schools. Champaign, Illinois: Research Press Company, 1972, 103-125.

McKenzie, H. S. The 1968-1969 Yearly Report of the Consulting Teacher Program: Volume I. Burlington, Vermont: Special Education Area, College of Education, University of Vermont, 1969.

McKenzie, H.S., Egner, A., Knight, M., Perelman, P., Schneider, B., and Garvin, J. Training consulting teachers to assist elementary teachers in the management and education of handicapped children. Exceptional Children, 1970, 37, 137-143.

Reynolds, M.C. and Balow, B. Categories and variables in special education. Exceptional Children, 1972, 38, 357-366.

Rosenthal, R. and Jacobson, L. Teachers' expectancies: Determinants of pupils' IQ gains. Psychological Reports, 1966, 19, 115-118.

Rouse, B. and Farb, J. Training adolescents to use behavior modification with the severely handicapped. Exceptional Children, 1974, 40, 286-287.

Seaver, P.E. An adaptation of a reading procedure for handicapped learners to a regular classroom of 23 third graders. Unpublished manuscript, Special Education Area, College of Education, Universi of Vermont, 1972.

Sidman, M. Tactics of scientific research. New York: Basic Books, Inc., 1960.

Vergason, G.A. Accountability in special education. Exceptional Children, 1973, 39, 367-373.

Wheeler, A. H. and Fox, W. L. Managing behavior: Part 5, behavior modification: A teacher's guide to writing instructional objectives. Lawrence, Kansas: H & H Enterprises, Inc., 1972.

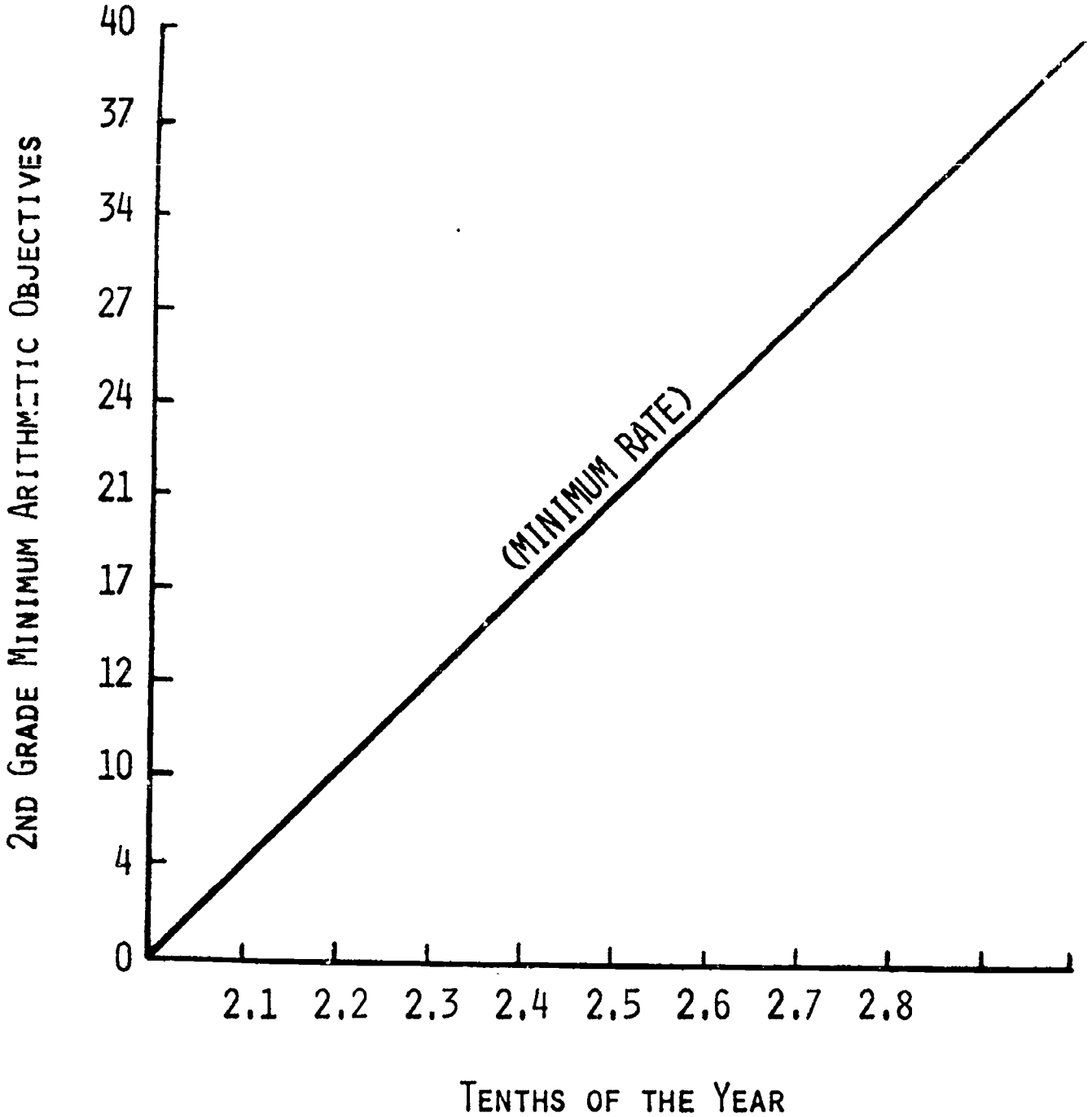

FIG. 1 MINIMUM RATE GRAPH FOR SECOND GRADE ARITHMETIC OBJECTIVES

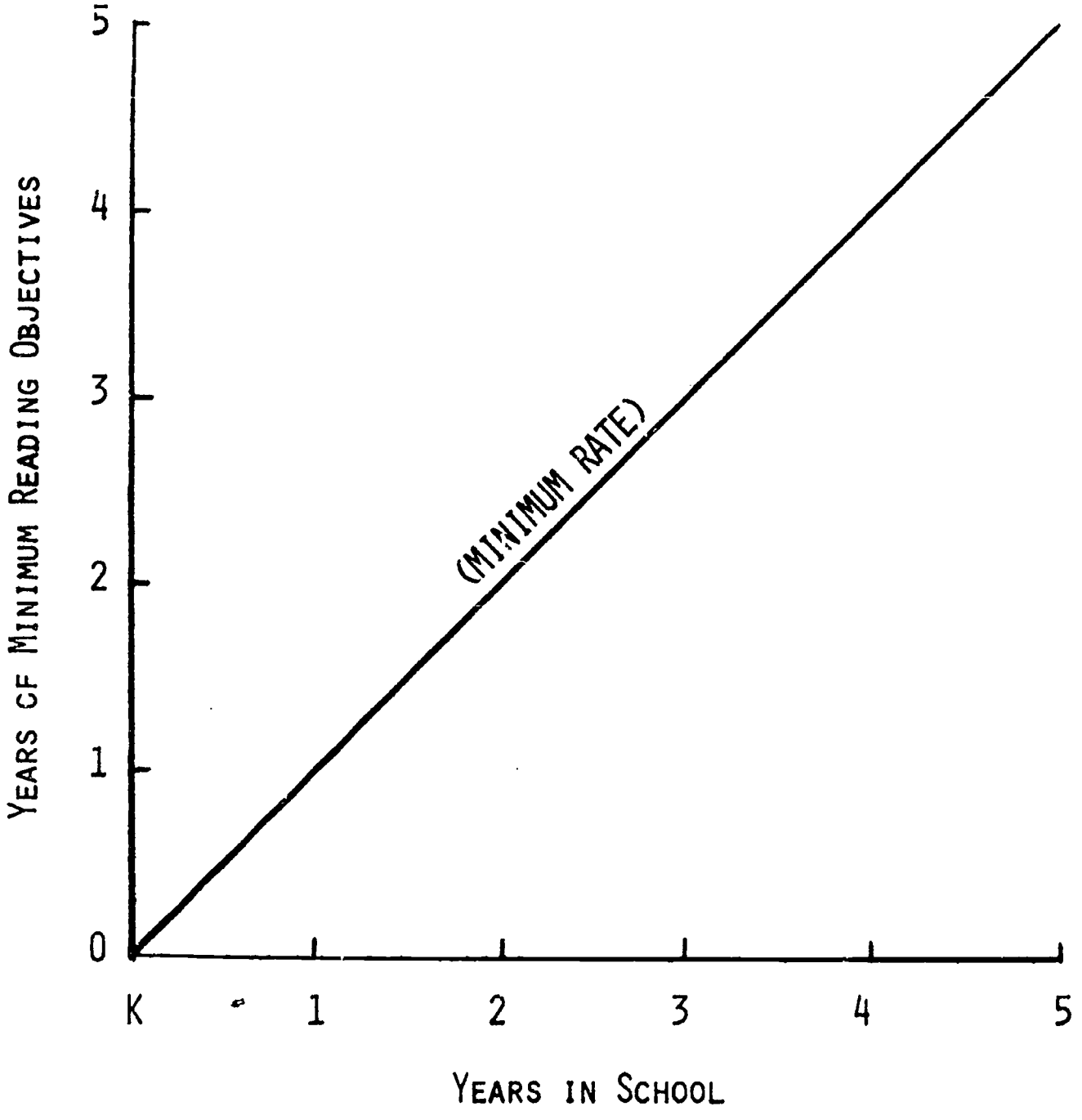

FIG. 2 MINIMUM RATE GRAPH FOR 5 YEARS OF READING OBJECTIVES

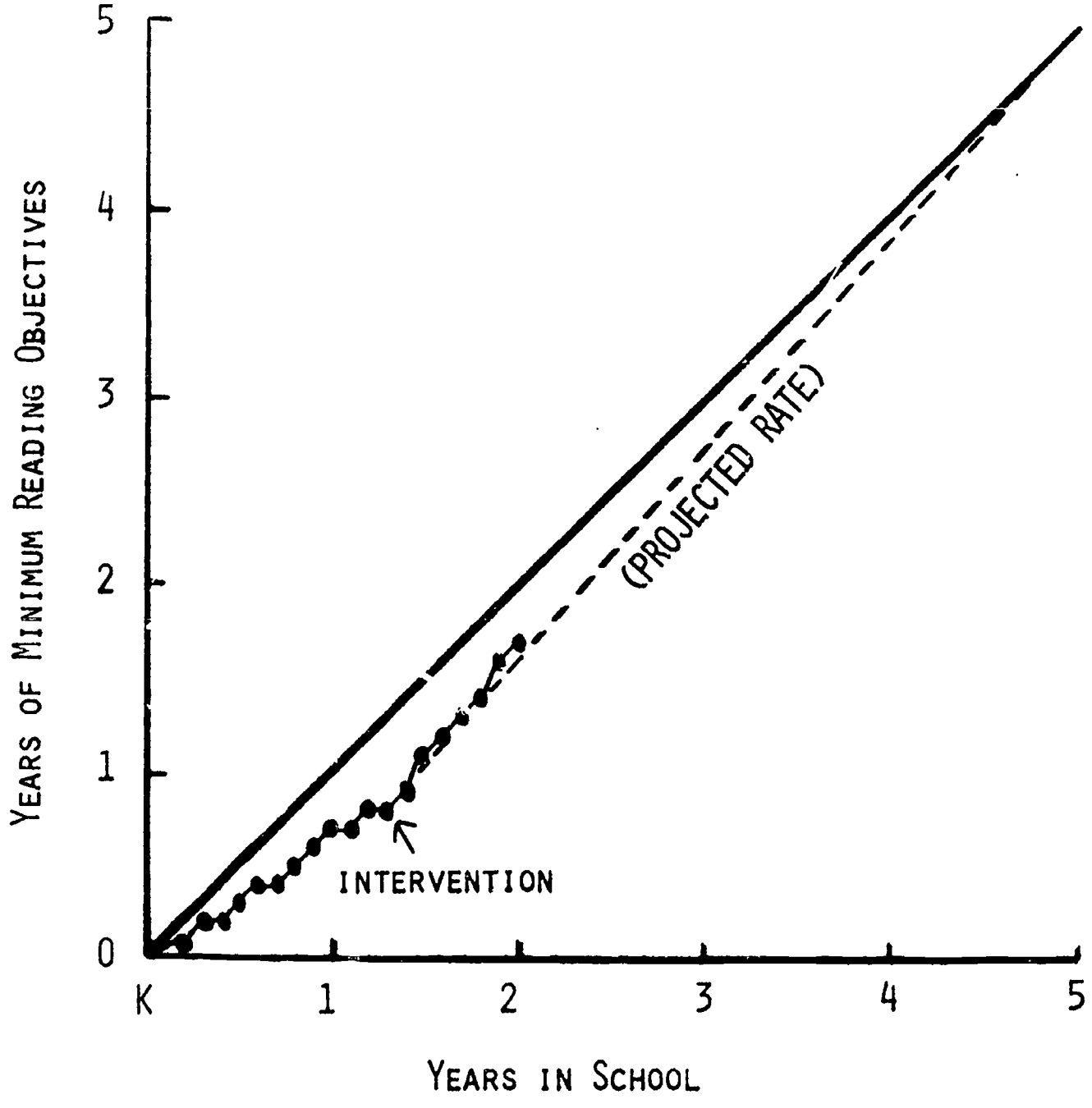

FIG. 3 RATE OF LEARNING WHICH SHOULD RESULT IN ACHIEVEMENT OF MINIMUM OBJECTIVES BY THE END OF GRADE 4

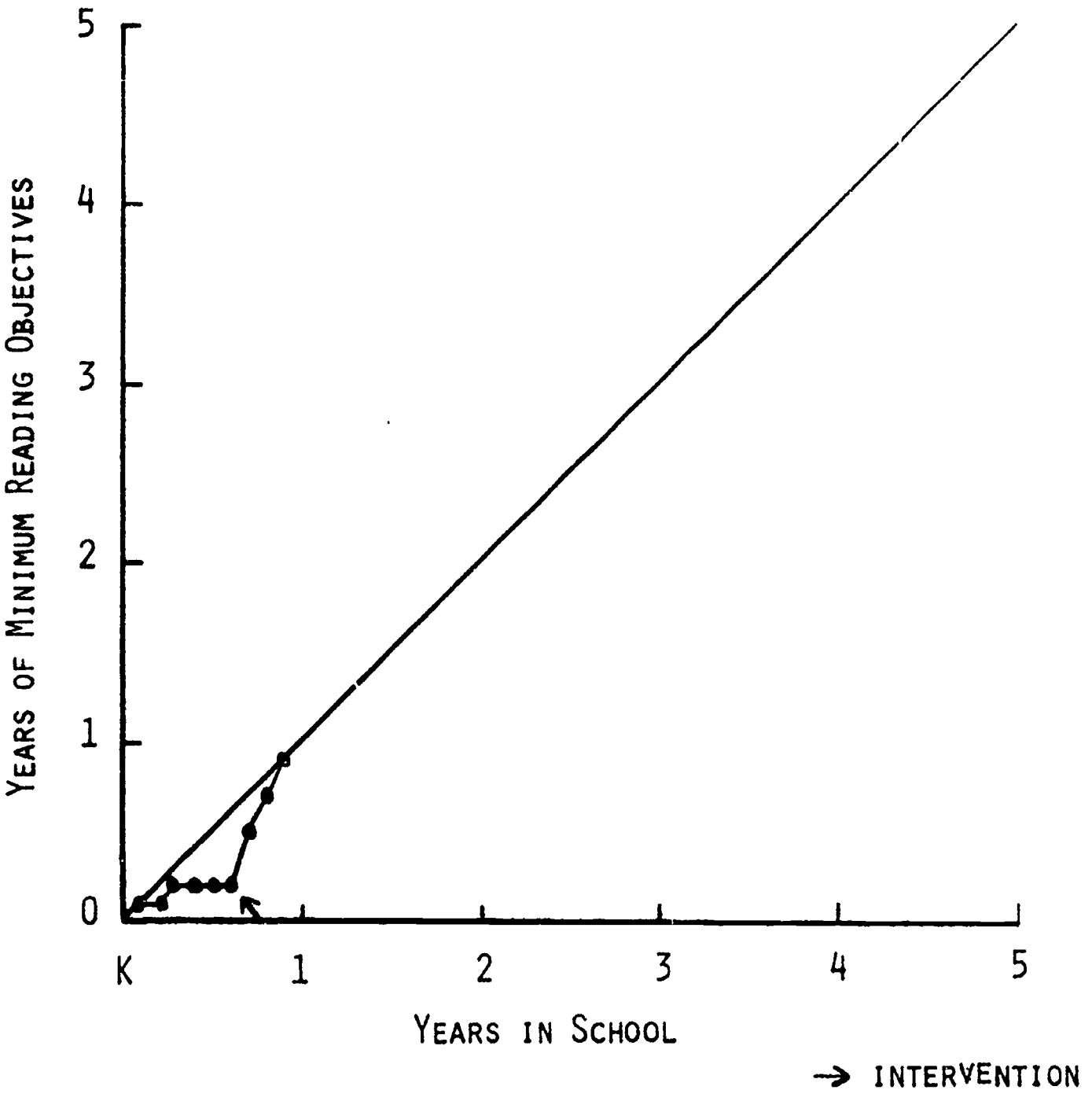

FIG. 4 RATE OF LEARNING WHICH RESULTS IN MASTERY OF ALL SCHOOL YEAR MINIMUM OBJECTIVES

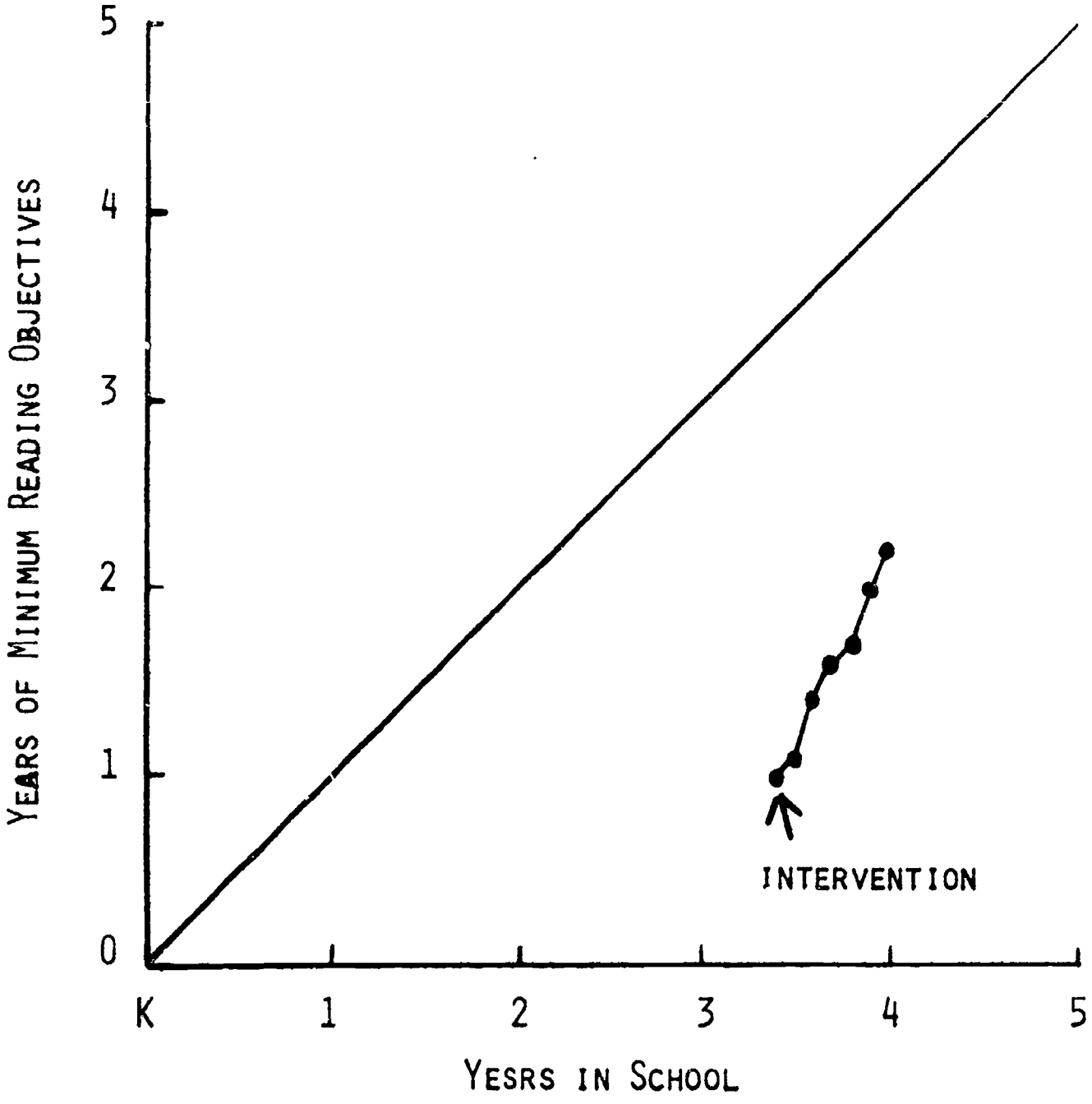

FIG. 5 RATE OF LEARNING WHICH IS DOUBLE THAT OF THE MINIMUM RATE

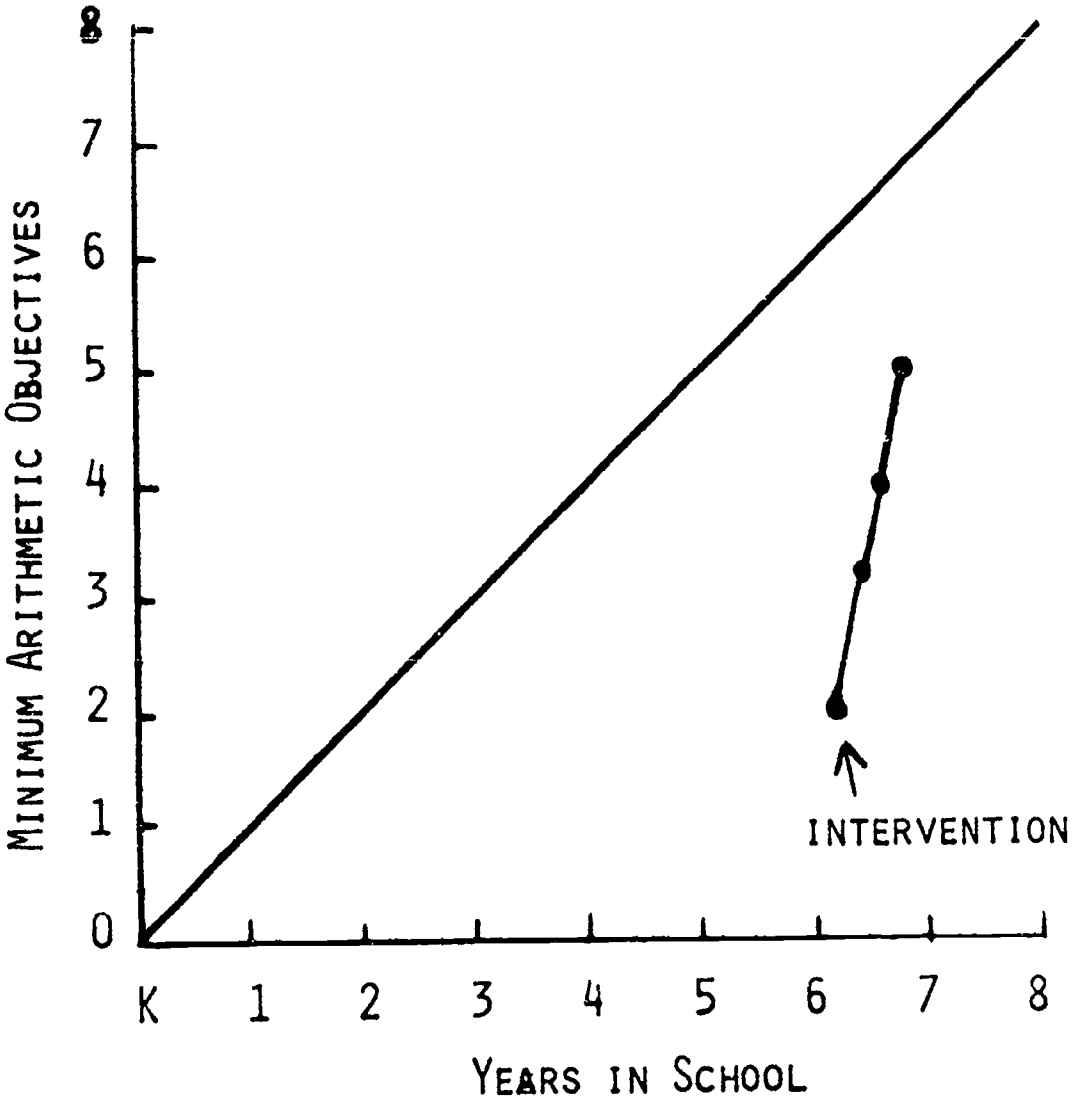

FIG. 6 ANN'S MINIMUM RATE GRAPH FOR ARITHMETIC

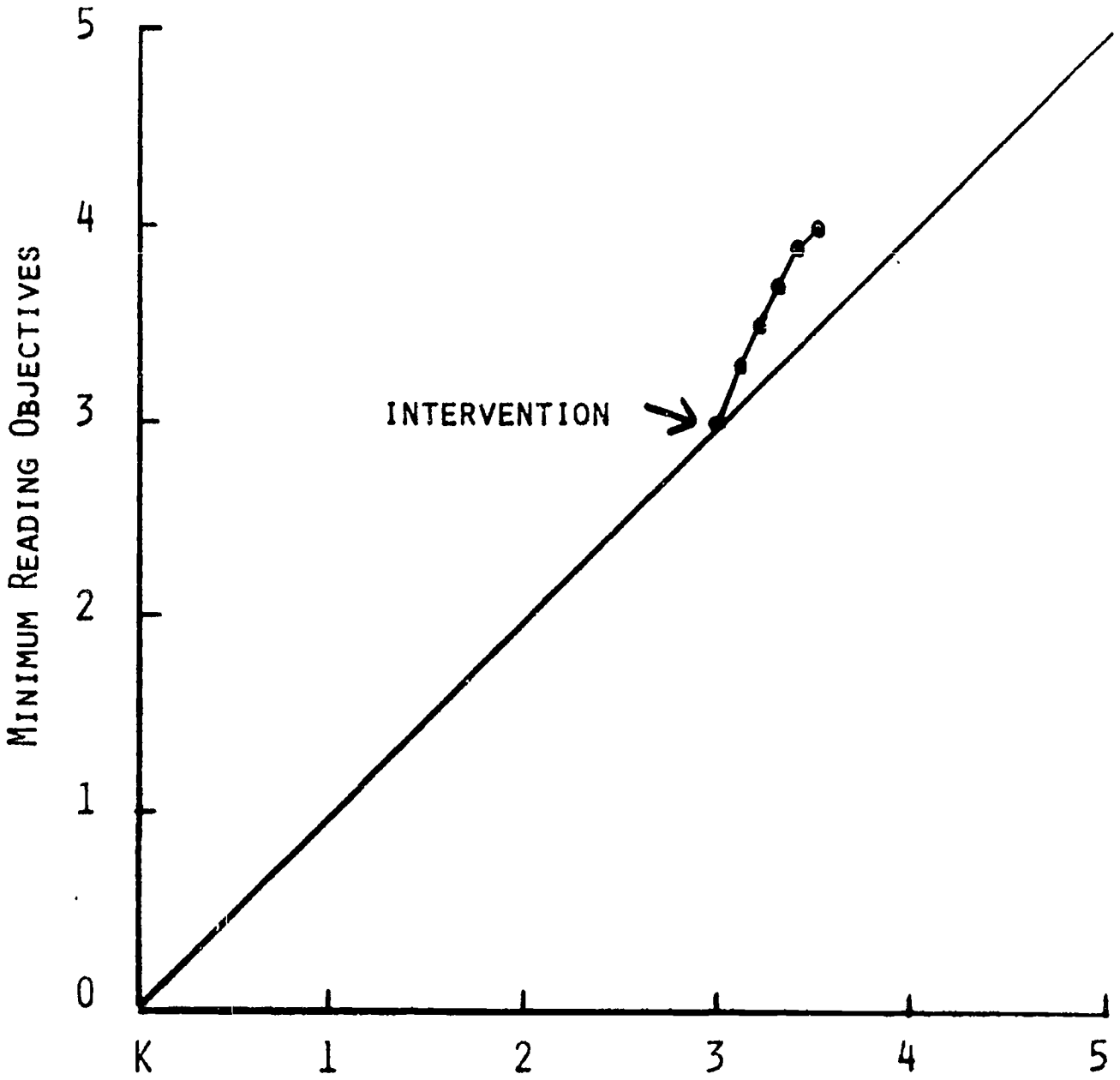

FIG. 7 JOE'S READING PROGRESS THROUGH THIRD GRADE