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AUTHOR Howley, Craig B.; Howley, Aimee A.
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ABSTRACT

Poverty prevalent in rural areas is associated with unequal representation in gifted programs. Some impediments to equal access include cultural prejudice, family distrust of schools, the stigma of academic success, inappropriate identification practices, and poor funding for rural programs. Five rural states have adopted measures to promote proportional representation, by developing adequate funding for rural gifted programs and fair identification practices. To identify the brightest students in isolated rural schools, norm-referenced tests can be used with local standardization. Three approaches are proposed: (1) create a pool of referrals from students whose achievement test scores fall in the top 50% for that school, administer a group IQ test to the referrals, refer the top quartile for individual IQ and achievement testing, rank students, and select top scorers until 3% of the school population has been identified; (2) create a pool of referrals from the top 25% of all scores on a group IQ test, administer an individual screening-level IQ test, rank the scores, and select the top scorers until 3% of the school population has been identified; (3) use an entire rural district to develop local norms and apply the norms to the test performance of referred children. (Author/JDD)

Craig B. Howley
Appalachia Educational Laboratory
Post Office Box 1348
Charleston, West Virginia 25325

Aimee A. Howley
University of Charleston
2300 MacCorkle Avenue, SE
Charleston, West Virginia 25304

GIFTED PROGRAMS: EQUAL ACCESS IN RURAL AREAS

Abstract

This paper considers the issue of equal access to gifted programs as it pertains to rural students, schools, districts, and states. It defines equal access and describes impediments to it. By focusing on educational policy that is amenable to change, the paper proposes three techniques to make substantive gifted education programs available to representative numbers of bright rural students.

Introduction

In the last 15 years U. S. schools have located larger numbers of talented children than at any time in history. According to state-level coordinators, there were in late 1985 over one million students identified as gifted throughout the nation. This figure was an increase of less than ten percent over the 1981 figure. Clearly, the era of phenomenal growth in the number of identified gifted students is ending.

Advocates and policymakers have now turned to improving the quality of programs. Their emphasis is on altering pull-out programs, providing more substantive instruction, and using acceleration more often.

Providing equal access to programs must also be part of the effort to improve program quality. So far, little has been done to ensure equal access, however.

Assumptions: What is Equal Access?

Concern for equal access is based on three assumptions. The first assumption is that access pertains to something essential or privileged--something important, but not necessarily relevant to everyone. Access to something trivial or harmful is more properly termed a "nuisance" or "risk," and is not an issue of privilege. Second, the concern with equality implies that access is, for some reason, unfairly restricted. Third is the assumption that efforts to remove unfair restrictions are warranted.

In order to be worthy of the efforts or resources that support them, gifted programs must be essential to bright students. When access to such programs is restricted, steps to provide equal access must show clear promise of increasing the representation of the bright students who have been unfairly excluded.

The importance of equal access. Gifted students, particularly those who are identified because of high IQ or advanced academic achievement, are able to master history, languages, literature, mathematics, and science with comparative ease. Bright students in rural schools need the kind of instruction that cultivates this ability, although they are less likely than affluent suburban students to get it. Lack of such instruction contributes to low college entrance scores and college attendance rates in rural districts.

Some educators believe that introducing rural students to the life of the mind is a mistake because it will alienate these students from the traditional values of their communities. If students are not tempted, then they cannot willingly abandon their rural roots, according to this argument. This objection is poignant, but it does not allow students to make informed decisions about their own lives. They cannot make such decisions in ignorance.

Restricted access to gifted programs. Equal access is an issue in gifted education for precisely the same reasons it is an issue in other endeavors of society: class conflict, racism, and sexism. More than race, ethnicity, or gender, however, poverty seems to be the influence that is most strongly associated with the unequal representation of various groups. It is very unlikely that children of the poor are represented in gifted programs in anything close to the proportion of the poor in the U. S. population.

The trend toward unequal representation of the poor in gifted education was established--perhaps created--by Terman. He identified very few children of farmers and workers back in the 1920s. Terman's assumptions about gifted students located them predominantly in the middle- and upper-classes.

Access to gifted programs is perhaps most unfairly limited in rural areas, because that is where our poorest citizens live (Sher, 1977). This restriction is unfair because it has not been documented that poor people are inherently less intelligent or academically talented than their more affluent fellow citizens (Dobzhansky & Montagu, 1975; Gould, 1981).

Common Impediments to Equal Access

The most pervasive impediment to equal access is the fact that many psychologists and educators are unsure about the inherent intellectual capabilities of poor children. They dispute the need for equal access not on political grounds, but on scientific grounds (i.e., empirical studies of IQ heritability among groups). The most cogent analysis of these heritability studies (Gould, 1980, 1981; Montagu, 1975), however, demonstrates the powerful influence of social and political prejudices on the empirical methods and findings of research in the social sciences.

The discussion here proceeds on the assumption that intellectual and academic ability--to the extent that it is inborn--is distributed in the same way among all subgroups of the U. S. population. That is, Blacks, Hispanics, and poor children are not born with less native talent than white, anglo-saxon, or affluent children. The discussion assumes that differences in the measured performance of various population subgroups can be ascribed to social, political, economic, and cultural influences. These environmental influences give rise to conditions that restrict certain groups from access to gifted programs. Five such impediments to equal access are considered below.

Cultural prejudice. It is not common for educators to believe that all children can learn. Surveys of teachers conducted by the Appalachia Educational Laboratory often find that teachers doubt whether all normal children can learn even in ideal instructional circumstances.

In a sense, teachers' low expectations are natural. Teachers spend a great deal of time with children whose behavior reflects a social order that is organized by the privileges of wealth and income. The behavior of students is a powerful influence on the perceptions of educators. Educators also know for certain that students of some cultural backgrounds tend to fare much less well in life than students of other cultural backgrounds.

Many educators, however, fail to examine the "naturalness" of their assumptions. The result is a widespread belief that observed differences in achievement (of both students and adults) reflect differences in native ability that are associated with cultural differences.

To expect teachers to disregard the evidence of their senses--the alienated behavior of students, the prospective adulthoods of poverty--is to expect a great deal. Nonetheless, that is the expectation of equal access. That so many agencies fall so far short in living up to the expectation suggests that cultural impediments to equal success are significant.

Family distrust of schools. The families of students from poor backgrounds often distrust schools. Rural families have strong traditional values that may conflict with the goals or methods of universal schooling. According to Litwak and Meyer (1974), families view the school system "as an outside and biased bureaucracy, an enemy of the family" (p. 124).

Parents understand that the ability of their children often is not credited by educators. This distrust is of the same sort as educators' low expectations: it is based on the evidence of common sense, but it is not necessarily warranted. Schools ought to expect achievement from all children, and parents ought to expect understanding and cooperation from the schools, even when both sets of expectations are frustrated.

The stigma of academic success. For at least 25 years, research has documented the unenviable plight of successful students. Even affluent white students suffer as a result of extreme achievement. Coleman (1961) and Tannenbaum (1962) both noted that the process of schooling worked against the valuation of intellectual pursuits. According to Coleman (1961, p. 304) the average student "as an individual, appears to be more oriented to scholarship than is the social system of the high school." Coleman blamed the schools for failing to cultivate intellectual values.

For bright poor students, however, the stigma of academic success is worse than for affluent bright students and for the average students cited by Coleman. For such students, academic success can be a token of capitulation to a system that is perceived as destructive.

Inappropriate identification practices. To perceive the inappropriateness of identification practices, educators must first accept (1) that it is fair to provide an excellent education to all groups in society and (2) that the most talented members of any group deserve the privilege of special services.

Procedures used to identify bright students do not typically result in the identification of many poor, Black, or Hispanic children. The mean test scores of these groups are lower than the total population mean. Yet when students are selected for gifted programs, their scores are not compared to the mean of similar students, but to the total population mean. In order to be identified as gifted, a Black student, for example, must demonstrate a score three or four standard deviations higher than that of the average Black student. White students need be only so rare as 1 in 33; Black students must be much more unusual among the population to which they should be compared (i.e., other Blacks). The plight of poor white students in rural areas is probably similar to the plight of Blacks.

Some districts attempt to identify poor students by using "subjective measures" (cf. Council of State Directors of Gifted Programs, 1986). These districts believe that, if they eschew standardized testing altogether, then they will be free to include more poor students. This observation is correct, but it means that districts must rely on unreliable measures that have little to do with academic talent.

There is no reason to believe that subjective measures of leadership ability, creativity, or student accomplishments will identify the most academically able poor, Black, or Hispanic students. Depending on the good will of the subjective evaluators, districts are free to include more poor students in programs; however, they are also free to exclude all poor students when they use subjective measures. This degree of uncertainty is inherent in the notion of subjective judgment.

Given what is known about cultural prejudice, it is probably very unwise to put a great deal of faith in the fairness of subjective measures. Objective measures have the advantage of allowing us to identify and even quantify our prejudices. We know, for example, what the differences in Black means and white means on IQ tests are. We are very unlikely, however, to understand how or to what degree our unexamined assumptions influence subjective judgments.

Poor funding for rural programs. Without a program, there is no incentive to identify gifted children. This fact is illustrated by Marland's (1972) finding that most principals did not believe that any of their students were gifted: gifted programs were not very common at the time. Today some educators will doubt whether many gifted students can be found in rural schools.

The experience of one rural state is informative. West Virginia has one of the most strongly supported gifted programs in the nation. Every LEA has gifted programs, and the services of a teacher of the gifted are available in every school. In West Virginia, some gifted children have been identified in almost all schools. Identification is made on the basis of scores on the Binet and Wechsler scales, but an equal access provision permits identification on either the Performance or Verbal scale of the Wechsler if a child is either poor or handicapped. Because Individualized Education Programs (IEPs) are required by state regulations, parents must be involved in developing programs. Parents have influenced local programs through direct involvement; and they have influenced state policy through parent organizations, letter-writing campaigns, and due process actions.

Ten years ago, no one expected that so many children would be identified in such a region, using such means (i.e., the Binet and the Wechsler). Nonetheless, even in West Virginia, the most rural counties of this mostly rural state are those with the smallest proportion of gifted students. These counties are among the poorest funded in a state where, incidentally, funding is more equitable than in many places throughout the nation.

Removing Impediments

Education is embedded in the culture of which it is a part, and substantial improvements materialize slowly (Cuban, 1982). The reforms in educational policy now underway are not likely to affect the cultural prejudices that unfairly restrict access to gifted programs. Our culture's suspicion of academic success and intellectual values is not amenable to direct change. Overcoming family distrust is also not a very direct method of improving access to gifted programs.

The sorts of practices that are likely to have an effect on promoting equal access are those over which educators have direct control: changes in identification practices and funding for rural gifted programs. Practitioners must understand, however, that the proposed changes in identification and funding present a strong challenge to prevailing cultural prejudices, schools' and society's view of intellect, and many standard schooling practices (Howley, Howley, & Pendarvis, 1986; Pendarvis, Howley, & Howley, 1987; cf. Tompkins, 1977).

State Policies on Equal Access to Gifted Programs

In late 1985 the fifty states and the District of Columbia reported to the Council of State Directors of Programs for the Gifted on the procedures they used to admit poor students and minority students to gifted programs. Twenty-eight states reported that they had no provisions for equal access. Ten reported only that they left such decisions to the Local Educational Agency. Eight reported that they relied on generic regulatory provisions: PL 94-142 regulations, Chapter I regulations, court-ordered desegregation plans, general policy statements, and legislation. Only five states cited the use of specific provisions: four states applied "more subjective" assessment techniques to poor and minority students, and one state (West Virginia) used a definition that specifies an alternative for such students.

These five states (Alaska, Arkansas, Iowa, South Dakota, and West Virginia) are all rural states in which strong support for gifted programs exists. All require that IEPs be developed for gifted students; four (all except Iowa) mandate that LEAs conduct programs; and the same four states supply the funding necessary to conduct local programs. Only 15% of the other 46 states require IEPs; only 26% mandate local programs and supply funding.

These data, however, are suggestive rather than conclusive; they are based on reports of state coordinators rather than on controlled observations. One main conclusion, however, seems warranted: most states have done very little to ensure equal access.

Strategies to Promote Equal Access to Gifted Programs

What alternatives exist to promote equal access? The preceding discussion suggested that only two of the noted impediments to equal access could be addressed by educators: funding for gifted programs and identification practices. States that have made the most serious efforts to improve access seem to be those that regard issues of funding and identification as instrumental. Both issues are considered next.

Adequate funding for rural gifted programs. In many states (e.g., California and New York) the primary source of funding for gifted programs is local revenue. Such a funding practice results in vigorous programs in affluent districts and "paper programs" in poor districts (Mitchell, 1981). The cultural prejudice that bright students live primarily in affluent districts is made to seem natural as a result of this funding practice.

When funding for gifted programs is distributed by the state to all local districts, inequities are lessened, though they do not necessarily disappear.

For example, in West Virginia funding is distributed to districts according to the number of exceptional children, including the gifted, in the district. In its funding formula, West Virginia gives LEAs three times the per pupil allocation for each exceptional child. The funds, however, are not required to be spent on particular programs, but become part of the LEA's general fund. They are an incentive that encourages LEAs to identify a maximum number of exceptional students.

The West Virginia approach has resulted in the identification of about 2.3% of the state's children as gifted. Very few LEAs have identified less than 1% of their student population as gifted; nonetheless, those LEAs constitute the state's most rural counties. Moreover, the most isolated rural schools in those LEAs are the ones most likely to have no students identified as gifted. The brightest students in those schools get no special assistance.

Fair identification practices. To address the problem of providing equal access in isolated rural schools (or other schools in which few or no students have been previously identified as gifted), changes in identification practices are warranted.

One approach is to alter the kind of tests used to identify students in these schools. This approach is adopted by the four states in which state coordinators reported the use of "subjective" measures. The relevance, reliability, and fairness of such measures was criticized above.

Another approach is to alter eligibility criteria for underrepresented students. This was the approach adopted by West Virginia in 1983; similar but more thorough proposals are made below. The proposals are intended to be equitable additions to current identification practice; they should be construed as tentative, experimental, and adaptable. Validation will require that studies of actual implementations be made.

Identifying the Brightest Students in Isolated Rural Schools

The most compelling argument against using norm-referenced tests to identify gifted students is that such tests discriminate against poor, minority students. There is, however, an alternative to abandoning such tests--which have the strengths of academic relevance and good reliability. The alternative is local standardization. The ensuing discussion offers three approaches to local standardization; each approach is practicable and each can be adapted to a variety of situations. The first two approaches are based on locally-generated ranks (rather than norms); the third is a complete norming procedure. Each has advantages and drawbacks that should be considered when choices among the three approaches are made (see Appendix F for a summary of advantages and drawbacks).

Commonalities. Each of the three approaches is based on these principles:

- identification for either academic potential or demonstrated academic achievement,
- selection of the most able 3% of a school's students, and
- defensible selection strategies.

Application of these principles requires mastery of at least elementary statistics and of test administration. It is not likely that isolated rural schools will be able to implement these procedures without technical assistance. To implement the first two approaches, schools should have the services of a school psychologist or teacher of the gifted who has been trained in statistical methods. Implementing the third approach is more difficult; more intensive technical assistance will be required, and the development process will be more extensive. The scope of the project is such that a regional development effort might yield the best results.

Finally, readers should again note that these measures are <u>additions</u> to identification procedures already in place, not measures that <u>supplant</u> existing identification procedures. They are proposed as safeguards for equal access.

<u>First approach.</u> This approach, like the next, relies on existing standardized group test scores to generate a pool of referrals. In the first approach, the pool of referrals for gifted services will be those students in the school whose scores fall in the top 50% of all scores on a group achievement test. If local norms (for the <u>school</u>, not for the <u>district</u>) are available, it will be easy to select students for referral. If local norms are not available, then selection should proceed in the following manner:

(1) Determine the mean national percentile rank for the school.
(2) Refer all students scoring at or above that level.

Next, administer a group IQ test to the pool of referrals. When testing is complete, rank the standard scores obtained from this administration, and refer the top quartile (25%) for individual testing with the Stanford Binet Intelligence Scale and the Woodcock-Johnson Tests of Achievement. This will represent 12.5% of the student population of the school.

In a small school of 200 students, 25 students will receive evaluation-level testing under this plan; administration of both tests will take between 2 and 4 hours for each student. The ablest students usually require a longer administration.

Finally, rank the students (by standard scores or z-scores) to whom individual tests have been administered (one list for <u>both</u> tests.) Rank students by the <u>highest</u> standard score or z-score among the five scores obtained from both tests (see Appendix A). Make sure that standard scores are expressed in terms of standard deviations of the same size--the Binet has a standard deviation of 16, whereas the Woodcock-Johnson has a standard deviation of 15. One set of scores will need to be altered (see the note about standard deviations in Appendix A). The formula for expressing Binet standard scores in standard deviation units of 15 is as follows:

$$[(SB - 100)/16 \times 15] + 100 = \text{new standard score}$$

Working from the highest scoring student down, select as many as necessary to bring the number of children identified as gifted to 3%. In a school in which no students have been identified as gifted, this will be the top quartile of students. (Tied ranks that fall in the selection range should count as a single student. See appendix A for an example of this final selection step in a hypothetical school of 200 students. The example includes tied ranks. See Appendix B for an outline of these procedures.)

Second Approach. In the second approach, the pool of referrals for gifted services will be those students in the school whose scores fall in the top 25% of all scores on a group IQ test (e.g., the Otis-Lennon School Ability Test, the Lorge-Thorndike Intelligence Test, the Cognitive Abilities Test). Referral should proceed in the following manner:

(1) Determine the percentile rank score or standar' score that locates the top quartile of students in the school.
(2) Refer all students scoring at or above that level.

Next, test each student in the pool of referrals with an individually-administered screening-level IQ test. The Slosson IQ Test is a good choice because it has been shown to be an effective and efficient screening test to use with gifted students. Short forms of the Wechsler scales and the Binet are also available for screening students in this approach (see Howley et al., 1986, pp. 45-48).

When test administration is complete, rank the standard scores obtained from this administration, and refer the top quartile (25%) for individual testing with the Stanford Binet Intelligence Scale and the Woodcock-Johnson Tests of Achievement. This will represent 6.25% of the student population of the school.

In a small school of 200 students, 13 students will receive evaluation-level testing under this plan; the time requirements and cautions cited above (for the first approach) apply to the second approach as well.

Finally, rank the students (by standard scores or z-scores) to whom individual tests have been administered (one list for both tests). Rank students by the highest standard score or z-score among the five scores obtained from both tests (see Appendix A). Make sure that standard scores are expressed in terms of standard deviations of the same size--the Binet has a standard deviation of 16, whereas the Woodcock-Johnson has a standard deviation of 15. One set of scores will need to be altered (see the note about standard deviations in Appendix A).

Working from the highest scoring student down, select as many as necessary to bring the number of children identified as gifted to 3%. In a school in which no students have been identified as gifted, this will be about half of the students who have received individual tests. (Tied ranks that fall in the selection range count as a single student. Again, see Appendix A for an example. See Appendix C for an outline of these procedures.)

Third Approach. The third approach is a more ambitious project. In this approach, an entire rural district is involved in developing local norms.

The first step is to include enough schools to allow selection of a representative sample of rural students. The development team will need first to develop a criterion for schools from which to draw the sample. Ideally, these would be rural schools in which few gifted students have been identified. Perhaps a criterion of fewer than 1% of identified gifted students would be reasonable.

The second step is to select a representative random sample of students for each year of age from kindergarten through grade 12. Thirty students for each year will allow development of usable norming data in a local district. The total norming sample, therefore, will be about 400 students. Educators might consider limiting an initial local norming project to students in grades K-6 if funding is a problem.

When it is certain that a representative random sample has been drawn, the entire sample should be administered the Stanford-Binet Intelligence Scale and the Woodcock Johnson Tests of Achievement. Following test administration, raw scores should be used to develop local norms.

Many technical decisions will need to be made during the course of the project. Technical assistance must be available to ensure that the team carries out its work on the basis of informed decisions. The development team should document the reliability of the data for each cohort; a microcomputer program that calculates descriptive statistics, percentile ranks, z-scores, KR-21 reliability, and standard error of measurement is included in Appendix D as an example of tools that are available for this work.

Finally, once local norms have been developed and validated, they can be used to identify students whose performance indicates a degree of ability or achievement that is exceptional in comparison to the average performance of the norming sample. The following definition illustrates this application:

> Gifted students are those who score at or above two standard deviations above the mean on the Stanford-Binet Intelligence Scale or any subtest of the Woodcock-Johnson Tests of Achievement in consideration of one standard error of measurement (local norms for XYZ district, September 1988 validation.)

Local norms need to be updated regularly, perhaps once every five to seven years. Development work for the initial effort might require as much as 1500 person-hours (4 staff members for 10 weeks). Updates might require 1000 person-hours. The results of such an effort, however, could be applied to local identification of educable mentally impaired, learning disabled, and other remedial populations as well. The project might be most effectively and efficiently carried out by an intermediate service unit or regional educational agency (see Appendix E for an outline of these procedures).

Advantages and drawbacks. The first and second approaches can probably be implemented with the assistance of a school psychologist or teacher of the gifted trained in statistical methods. As a source of referrals, both approaches use group tests commonly administered in schools. They differ in the way in which they require that individual testing be carried out. The first approach requires more evaluation-level testing than the second (12.5% of the school population vs. 6.25%). The second approach splits individual testing between an intermediary screening level (25% of the school population) and a final evaluation level (6.25% of the school population). Based on what is known of gifted students, the two approaches should have similar effectiveness and efficiency ratios (Pegnato & Birch, 1959).

The first two methods share one serious drawback. They can be implemented only once during the school year, since they require that a sizable pool of referrals be studied. If referrals are made at other times during the school year, the ordinary procedures (using national norms) will apply. That is, these approaches do not account for rolling referrals.

The third approach overcomes this drawback, because once local norms have been successfully developed, evaluations can be carried out whenever a referral for a bright rural child is received. Evaluators simply apply the developed norms to the test performance of a referred child. It is, however, more difficult and perhaps more costly to develop local norms (see Appendix F for a summary of the advantages and drawbacks of the three approaches proposed in this paper).

The Nature of Substantive Gifted Programs

It is not sufficient merely to identify the brightest rural students as gifted; their identification must result in substantive improvements to their education. The nature of substantive gifted programs is explained briefly, below, so that this obligation is clear.

Recent studies (Council, 1986; Cox et al., 1985; C. Howley, 1986) indicate that most gifted programs need substantial improvement to increase the effect they have on student achievement. The suggested improvements--more extensive use of acceleration, more substantive instruction in foreign languages, literature, mathematics, history, and the natural sciences--apply equally to programs in rural, urban, and suburban areas. Programs must address students' mastery of advanced academic skills. Pull-out enrichment programs seem much less likely than other arrangements to effect these improvements (Cox et al., 1985). Policy initiatives for program improvement are specified in detail in a paper by C. Howley (1986). The use of acceleration in rural schools is the topic of an instructional module published by the National Rural Development Institute (Pendarvis, Howley, & Howley, 1987).

Summary

State provisions for equal access to gifted programs are inadequate to promote the proportional representation of bright students in rural schools. However, five rural states seem to have adopted measures that represent reasonable initial efforts. These efforts involve changes in (1) funding for gifted programs and (2) the way gifted students are identified.

This paper discussed funding arrangements that can improve equal access in some rural areas. It also presented three approaches to improve the access of bright students, especially those in small, isolated rural schools. These approaches involve changes in selection procedures, but they retain the use of identification instruments that are academically relevant.

The paper concluded with a brief statement of the need for substantive academic instruction for students identified as gifted, together with reference to sources that provide guidelines for the structure and implementation of such programs.

REFERENCES

Coleman, J. (1961). The adolescent society. Glencoe, NY: Free Press.

Council of State Directors of Gifted Programs. (1986). The state of the states' gifted and talented education. Augusta, ME: Maine Department of Education, Station #23.

Cox, J., Daniel, N., & Boston, B. (1985). Educating able learners. Austin TX: University of Texas Press.

Cuban, L. (1982). Persistence of the inevitable: The teacher-centered classroom. Education and Urban Society, 15(1), 26-41.

Dobzhansky, T. & Montagu, A. (1975). Natural selection and the mental capacities of mankind. In A. Montagu (Ed.), Race and IQ (pp. 104-113). London: Oxford University Press.

Gould, S.J. (1981). The mismeasure of man. New York: Norton.

Howley, A., Howley, C., & Pendarvis, E. (1986). Teaching gifted children. Boston: Little, Brown.

Howley, C. (1986). Intellectually gifted students: Issues and policy implications. Charleston, WV: Appalachia Educational Laboratory.

Kanter, H. (1985). Computer applications of educational measurement concepts. NY: Macmillan.

Litwak, E. & Meyer, H. (1974). School, family, and neighborhood. NY: Columbia University Press.

Marland, S. (1972). Education of the gifted and talented (Report to the Congress of the United States by the U. S. Commissioner of Education). Washington, D.C.: U. S. Government Printing Office.

Mitchell, P. (1981). An advocate's guide to building support for gifted and talented education. Washington, D.C.: National Association of State Boards of Education.

Montagu, A. (1975). Race and IQ. London: Oxford University Press.

Pendarvis, E., Howley, A., & Howley, C. (1987). Acceleration as a method to individualize instruction for gifted students in rural schools. Bellingham, WA: National Rural Development Institute.

[illegible], J. (Ed.). 1977. Education in rural education: A reassessment of the [illegible]ventional wisdom. Boulder, CO: Westview Press.

Tannenbaum, A. (1962). Academic attitudes toward academic brilliance. NY: Bureau of Publications, Teachers College, Columbia University.

Tompkins, R. (1977). Coping with sparsity: A review of rural school finance. In J. Sher (Ed.), Education in rural America: A reassessment of the conventional wisdom (pp. 125-155). Boulder, CO: Westview Press.

Appendix A

EXAMPLE OF FINAL SELECTION RANKING IN APPROACHES 1 and 2
(hypothetical school of 200 students with no identified gifted students)

------------------standard scores------------------

(standard deviation of Binet altered to = 15)
[see formula in text]

ID#	rank	Stanford Binet	Woodcock-Johnson Tests of Achievement			
			RDG	MATH	WL	KNOW
(1)	1	137	122	118	97	129
(2)	2	124	107	131	125	110
(3)	3.5	128	115	120	103	121
(4)	3.5	109	128	108	122	118
(5)	5	120	116	111	105	118
(6)	6.5	105	109	119	105	105
(7)	6.5	119	118	119	117	116
(8)	8	115	116	108	110	109
(9)	9	102	108	112	107	98
(10)	11	97	110	101	93	102
(11)	11	107	108	110	100	105
(12)	11	110	101	89	84	110
(13)	13.5	107	109	108	100	102
(14)	13.5	109	107	105	106	108
(15)	16.5	108	108	84	92	105
(16)	16.5	108	97	102	107	107
(17)	16.5	108	107	100	98	96
(18)	16.5	98	107	108	95	104
(19)	19	105	105	104	103	106
(20)	21	100	104	104	102	97
(21)	21	103	104	87	91	103
(22)	21	89	84	104	97	100
(23)	24	103	96	102	87	100
(24)	24	103	102	101	95	98
(25)	24	103	92	91	99	96

Three percent of 200 is 6. Therefore, if no students have been identified as gifted, provide services to the 6 top-ranked students. In this case, because there is a tie in ranks, select the top 7 students (i.e., through rank 6.5). If 2 students were previously identified as gifted, provide services to the top 4 students. This example illustrates the way in which tied ranks may be handled.

This distribution is illustrative of a sample whose scores on the Stanford-Binet would yield a mean IQ of about 90 (assuming normality and variability reduced by 25%).

Appendix B

SUMMARY OF PROCEDURES FOR APPROACH #1

1. Refer top 50% of distribution on a group achievement test.

   a. Use local (school) norms if available, or, if not

   b. determine local mean of national norms, select all students scoring at or above that level.

2. Administer group IQ test to the pool of referrals.

3. Rank the standard scores obtained from this administration.

4. Evaluate the top quartile (25%) for individual testing with the Stanford Binet Intelligence Scale and the Woodcock-Johnson Tests of Achievement.

5. Rank the students to whom individual tests have been administered (one list for both tests.)

   a. Use z-scores or standard scores.

   b. If using standard scores, equalize standard deviation.

6. Select as many students as necessary to bring the number of children identified as gifted to 3%.

   a. Tied ranks count as a single student.

Appendix C

SUMMARY OF PROCEDURES FOR APPROACH #2

1. Refer top 25% of distributi-n on a group IQ test.

   a. Determine local fourth quartile of national norms, select all students scoring at or above that level.

2. Administer individual screening IQ test to referred students.

3. Rank the standard scores obtained from this administration.

4. Evaluate the top quartile (25%) for individual testing with the Stanford Binet Intelligence Scale and the Woodcock-Johnson Tests of Achievement.

5. Rank the students to whom individual tests have been administered (one list for both tests.)

   a. Use z-scores or standard scores.

   b. If using standard scores, equalize standard deviation.

6. Select as many students as necessary to bring the number of children identified as gifted to 3%.

   a. Tied ranks count as a single student.

Appendix D: microcomputer program

Appendix D consists of a print out and sample run of a program that might be adapted to generate the local norms of approach #3. This program is included here primarily to demonstrate the feasibility of generating local norms with limited resources. More powerful programs, however, are available at modest cost to implement the proposals of this paper. This program was adapted from routines developed by Kanter (1985).

Previous applications. The principal presenter has used the program to conduct institutional research and to provide development data about his classroom tests. It has been used with an Apple //e micrcomputer and Imagewriter printer.

Features. From raw scores this program generates the following information and sends output to a printer:

- sample size,
- frequency distribution,
- measures of central tendency (mean, median, modes),
- variance and standard deviation,
- z-scores,
- percentile ranks,
- KR-21 reliability, and
- standard error of measurement (estimated from KR-21).

Limitations. The program is designed to receive up to 450 raw scores. The program cannot accept multiple scores for individual subjects. For use with a large number of scores, the program needs to be modified to include a loop that allows users to correct scores that are entered incorrectly. The loop that calculates sample size should also be improved. These changes can probably be made with locally-available talent in most districts.

```
PR#0
]LIST-450

10  REM **MEAN,MEDIAN,MODE**
20  HOME
30  DIM A(450): DIM B(450)
40  PRINT "DO YOU WANT THE MODE(S) DISP. (Y/N)?"
50  INPUT A$
60  PRINT "DO YOU WANT RELIAB. & SEM (Y/N)?"
70  INPUT B$
80  PRINT "DO YOU WANT %-ILE RANKS (Y/N)?"
90  INPUT C$
100  PRINT "DO YOU WANT FREQ. CHART (Y/N)?
110  INPUT D$
120  LET T = 0
130  PRINT "ENTER # OF TEST ITEMS (<101)": INPUT K
140  PRINT : PRINT : PRINT :
150  PRINT "ENTER RAW SCORES, ANY ORDER"
160  PR# 0
170  PRINT
180  FOR I = 1 TO 1000: INPUT A(I): LET T = T + A(I)
190  FOR G = 1 TO N: PRINT "LAST DATA PIECE? (Y/N)": INPUT G$: IF G$ = "Y
     " THEN  GOTO 230
200  IF G$ = "N" THEN  PRINT "INPUT NEXT DATUM"
210  NEXT G
220  NEXT I
230  HOME
240  LET N = I
250  PR# 1: PRINT : PRINT "NUMBER OF ITEMS ON TEST = ";K: PRINT
260  PRINT "SAMPLE SIZE (N) = ";N: PRINT
270  LET M = T / N
280  REM ***SORT AND ORDER DATA***
290  FOR I = 1 TO N
300  FOR J = (I + 1) TO N
310  IF A(I) > A(J) THEN  GOTO 350
320  LET X = A(I)
330  LET A(I) = A(J)
340  LET A(J) = X
350  NEXT J: NEXT I
360  FOR I = 1 TO N: NEXT I
370  FOR J = 1 TO K: NEXT J
380  LET B(J) = 0
390  FOR I = 1 TO N: FOR J = 1 TO K
400  IF A(I) = J THEN  LET B(J) = B(J) + 1
410  NEXT J: NEXT I
420  IF D$ = "N" THEN  GOTO 560
430  REM **CLEAR, DATA DISP, HI TO LO***
440  HOME
450  PRINT "SCORE","FREQUENCY"
```

```
]LIST460-910

460  FOR J = K TO 1 STEP  - 1
470  IF B(J) <  > 0 THEN  PRINT J,B(J)
480  NEXT J
490  PRINT " "
495  PR# 0: PRINT "FORMAT PAGE BREAK": PRINT : PRINT "THEN PRESS 'RETURN'
     ": INPUT L$: HOME : PR# 1
500  REM ***TALLY, DISP. 0'S***
510  LET C = 0: FOR I = 1 TO N
520  IF A(I) = 0 THEN  LET C = C + 1
530  NEXT I
540  IF C <  > 0 THEN  PRINT "0",C
550  FOR I = 1 TO N: NEXT I
560  REM **CALC MED & DISP. MEA & MED***
570  LET X =  ABS (A(I) - M)
580  IF N / 2 =  INT (N / 2) THEN  GOTO 610
590  LET MD = A((N / 2) + .5)
600  GOTO 620
610  LET MD = (A(N / 2) + A((N / 2) + 1)) / 2
620  LET ME =  INT (100 * M + 0.5) / 100
630  PRINT "MEAN= ";ME,"MED.= ";MD
640  IF A$ = "N" THEN  GOTO 760
650  REM **CALC & DISP MODE**
660  LET MO = 0
670  FOR J = 1 TO K
680  IF B(J) > MO THEN  LET MO = B(J)
690  NEXT J
700  IF MO < C THEN  GOTO 740
710  FOR J = 1 TO K
720  IF MO = B(J) THEN  PRINT "THE MODE = ";J
730  NEXT J
740  IF MO < C THEN  PRINT "THE MODE = 0"
750  PRINT " "
760  REM ***CALCULATE STANDARD DEVIATION/MEAN/VARIANCE***
770  LET D = 0
780  FOR I = 1 TO N
790  LET X =  ABS (A(I) - M)
800  LET D = D + X ^ 2
810  NEXT I
820  LET V = D / N
830 VR = ( INT (V * 100 + 0.5)) / 100
840  LET S =  SQR (V)
850  LET SR =  INT (S * 100 + 0.5) / 100
860  PRINT "STANDARD DEVIATION = ";SR
870  PRINT "VARIANCE = ";VR
880  PRINT " "
890  REM **ZSCORES,%ILE RANK**
900  IF C$ = "N" THEN  GOTO 1080
910  LET D = 0
```

```
]LIST920-1190

920  FOR I = 1 TO N
930  LET X =  ABS (A(I) - M)
940  LET D = D + X ^ 2
950  NEXT I
960  LET V = D / N
970  LET S =  SQR (V)
980  PRINT "RAW SCORE","Z-SCORE","%-ILE RANK"
990  FOR J = K TO 1 STEP  - 1
1000  LET Z = (J - M) / S
1010  LET P1 = (Z ^ 13 / 599040) - (Z ^ 11 / 42240) + (Z ^ 9 / 3456) - (Z
      ^ 7 / 336) + (Z ^ 5 / 40) - (Z ^ 3 / 6) + Z
1020  LET P2 = P1 / 2.506628 + 0.5
1030  LET PR =  INT (P2 * 100 + 0.5)
1040  LET ZR = ( INT (Z * 100 + 0.5)) / 100
1050  IF B(J) <  > 0 THEN  PRINT J,ZR,PR
1060  NEXT J
1070  IF B$ = "N" THEN  END
1080  LET SR =  INT (S * 100 + 0.5) / 100
1090  REM ***RELIAB & SEM****
1100  LET R1 = (K * V) - (M * (K - M))
1110  LET R2 = R1 / (V * (K - 1))
1120  LET RR =  INT (R2 * 100 + 0.5) / 100
1130  LET SM = S *  SQR (1 - R2)
1140  LET SE =  INT (SM * 100 + 0.5) / 100
1150  PRINT " "
1160  PRINT "THE KUDER-RICHARDSON 21 RELIABILITY =";RR
1170  PRINT "THE STANDARD ERROR OF MEASUREMENT = +/-";SE
1180  PR# 0
1190  END

]
```

SAMPLE SIZE (N) = 14

SCORE	FREQUENCY
33	1
32	1
30	1
27	2
26	3
25	1
22	1
21	1
19	2
15	1

MEAN= 24.86 MED.= 26
THE MODE = 26

STANDARD DEVIATION = 4.97
VARIANCE = 24.69

RAW SCORE	Z-SCORE	%-ILE RANK
33	1.64	95
32	1.44	92
30	1.03	85
27	.43	67
26	.23	59
25	.03	51
22	-.57	28
21	-.78	22
19	-1.18	12
15	-1.98	2

THE KUDER-RICHARDSON 21 RELIABILITY =.73
THE STANDARD ERROR OF MEASUREMENT = +/-2.59

Appendix E

SUMMARY OF PROCEDURES FOR APPROACH #3

1. Obtain technical assistance.

   a. funding

   b. sampling and psychometric expertise

   c. regional cooperation

   d. development team tasks

      (1) policy and design

      (2) test administration

      (3) development of norms

      (4) application guidelines

      (5) periodic revision of norms

2. Identify sample schools.

3. Identify representative random sample.

4. Administer Stanford-Binet and Woodcock Johnson Tests of Achievement.

5. Develop and validate local norms.

6. Adapt test manuals and scoring materials.

7. Update norms periodically.

Appendix F

ADVANTAGES AND DRAWBACKS OF APPROACHES 1, 2 & 3

Approach	Advantages	Drawbacks
1 & 2	a. promotes equal access b. uses in-place scores for referral c. uses locally available expertise d. cost efficient locally e. effective and efficient selection	a. changes national norms b. no rolling referrals c. additional expense
3	a. promotes equal access b. district or regional initiative c. norms good for 5-7 years d. allows for rolling referrals e. resembles standard evaluation practice	a. changes national norms b. startup requirements c. procedures complicated d. additional expense

Handout #1

EQUAL ACCESS AND STRONG SUPPORT FOR GIFTED PROGRAMS
(two categories of state effort on equal access)

CATEGORY I: SOMETHING

The following (5) states use "more subjective" means (4) to identify minority students or have adopted a definition (1*) that addresses the issue (late 1985):

AK, AR, IW, SD, WV*

Of these states, all require IEPs; 4 mandate programs and funds. Note that all these states are rural states.

CATEGORY II: NOTHING OR NEXT TO NOTHING

The following (28) states reported that they had no provisions for equal access in late 1985:

CO, DE, FL, GA, HI, ID, IN, KS, KY, ME, MD, MT, NB, NH, NJ, NM, NY, NC, ND, OH, PA, RI, SC, TN, TX, UT, VT, WI

Of these states 21% require IEPs; 43% mandate programs and funds.

The following (10) states leave decisions about equal access to local agencies (late 1985 data):

CA, LA, MI, MN, MS, MO, OK, VA, WY, IL

Of these states 10% require IEPs; 30% mandate programs and funds.

The following (8) states appear to rely on the generic language of other programs to ensure equal access (late 1985 data):

AL, AZ, CN, DC, MA, NV, OR

Of these states, 1 (13%) requires IEPs; 2 (25%) mandate programs and funds.

Data source: Council of State Directors of Programs for the Gifted. (1986). The state of the states' gifted and talented education (2nd ed.). Author: Augusta, ME.

Data are based on reports from state coordinators; interpret data cautiously, as respondents' perceptions. View implications as tentative.