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EDUCATIONAL ACCELERATION OF INTELLECTUALLY TALENTED YOUTHS: PROLONGED DISCUSSION BY A VARIED GROUP OF PROFESSIONALS

Sanford J. Cohn, William C. George, Julian C. Stanley, editors

ABSTRACT

For many years various forms of educational acceleration have been used. James Fenimore Cooper entered Yale College at age 13, Norbert Wiener was graduated from a village high school in Massachusetts at age 11 and Tufts College (Phi Beta Kappa) at age 14, and the brilliant young Princeton University mathematician Charles Fefferman simply entered college at 14 without a high school diploma and received his Ph.D. degree at barely 20. Entering school early, skipping grades, moving ahead fast in a subject such as mathematics, taking college courses part time while still in secondary school, doubling up to be graduated from high school early, leaving high school for college without a diploma, completing college in less than eight semesters, earning a master's degree concurrently with the bachelor's, and myriad variations of these enable a relatively few students to break the age-in-grade lock step that characterizes most schools and colleges, both public and private, in the United States.

It appears that not a single substantial study has ever shown acceleration to be harmful to the typical accelerant who is intellectually able enough to warrant the use of such procedures. On the average the results are decidedly beneficial, whereas the withholding of acceleration from able, well-motivated youths is likely to harm their academic, social, and emotional development. Most evidence against acceleration is of the "I knew a student who . . ." variety.

In April of 1977 the time seemed ripe for some of the best educational and psychological thinkers from a variety of backgrounds and viewpoints to examine this belief system and to try to ascertain its causes, consequences, and possible antidotes. By having a lengthy, spirited exchange of facts and opinions among some twenty professionals, each of whom summarized his or her own position briefly, and the audience, it was possible to explore the issues and to move toward resolving them. Such discussion seems never to have been staged before on nearly the scale of this symposium. Aided by background material furnished

by the organizer (Julian C. Stanley), each symposiast prepared a brief position paper and read it at the symposium. The names and the addresses of those professionals follow:

Dr. Anne Anastasi, Professor of Psychology, Fordham University, New York, New York 10458.

Dr. Scarvia B. Anderson, Director and Senior Vice-President, Educational Testing Service, Room 1040, 3445 Peachtree Road, N.E., Atlanta, Georgia 30326.

Dr. Alvia Y. Branch, Social Science Research Council, 605 Third Ave., New York, New York 10016.

Dr. Stephen P. Daurio, Assistant Professor of Psychology, St. John's University, Staten Island, New York, New York 10301.

Dr. Virginia Z. Ehrlich, Project Director, Gifted Child Studies, 40 Seventh Ave., S., New York, New York 10014.

Dr. Lynn H. Fox, Associate Professor of Education and Coordinator of the Intellectually Gifted Child Study Group (IGCSG), Evening College and Summer Session, The Johns Hopkins University, Baltimore, Maryland 21218.

Mr. William C. George, Director, Office of Talent Identification and Development (OTID), and Associate Director, Study of Mathematically Precocious Youth (SMPY), The Johns Hopkins University, Baltimore, Maryland 21218.

Dr. E. Glenadine Gibb, Professor of Mathematics Education, The University of Texas, Austin, Texas 78712.

Dr. Marvin Gold, Department Chairman, School of Special Education, The University of South Alabama, Mobile, Alabama 36688.

Dr. Robert J. Havighurst, Professor of Education, The University of Chicago, 5885 Kimbark Ave., Chicago, Illinois 60637.

Dr. David M. Jackson, Co-Director, National Institute on Gifted and Talented, 11539 Maple Ridge Road, Reston, Virginia 22090.

Dr. Nancy E. Jackson, Developmental Psychology Laboratory, The University of Washington, Seattle, Washington 98195.

Dr. H. Thomas James, President of the Spencer Foundation, 875 N. Michigan Ave., Chicago, Illinois 60611.

Dr. Elizabeth I. Kearney, Curriculum Specialist, Gifted Program, Pasadena Unified School District, 351 S. Hudson Ave., Pasadena, California 91109.

Dr. Daniel P. Keating, Associate Professor of Child Development, Institute of Child Development, University of Minnesota, Minneapolis, Minnesota 55455.

Dr. Albert K. Kurtz, State Consultant and former Professor of Psychology, 1810 Ivy Lane, Winter Park, Florida 32792.

Mr. Leroy Owens, Anchorage Public Schools, Anchorage, Alaska 99503.

Dr. Ellis B. Page, Professor of Education, Duke University, Durham, North Carolina 22706. Formerly he was at the University of Connecticut.

Dr. Joseph S. Renzulli, Professor of Educational Psychology. The University of Connecticut, Storrs, Connecticut 06268.[1]

[1]EDITORS' NOTE: Professor Renzulli was unable to attend the symposium. He did provide the editors with a position paper, however. It has been inserted at the point where he would have spoken.

Dr. Dorothy A. Sisk, Formerly Director, Office of the Gifted and Talented, Department of Health, Education, and Welfare, Washington, D.C. 20202.[2] Currently Professor of Special Education, University of South Florida, Tampa, Florida 33620.

Dr. Julian C. Stanley, Professor of Psychology and Director of the Study of Mathematically Precocious Youth (SMPY), The Johns Hopkins University, Baltimore, Maryland 21218.

Dr. Joan S. Stark, Dean of the School of Education, The University of Michigan, Ann Arbor, Michigan 48104.

The symposium was begun by Julian C. Stanley.[3]

STANLEY: I'm delighted to welcome you today to the Symposium on Educational Acceleration of Intellectually Talented Youths. This is a prolonged discussion by some twenty professionals from various persuasions and several points of view. We are fortunate to have them come together here. The participants are divided into four groups. Each person within a given group will present a short position paper and then there will be a discussion among the members of that group. We will then go on to the next group. After these papers have been presented, there will be time for full-scale discussion with the audience.

The introduction to the symposium will be given by Dr. H. Thomas James, who is President of the Spencer Foundation and who prior to that time was the Dean of the School of Education at Stanford University. Dr. James:

INTRODUCTORY COMMENTS

H. Thomas James

When I left Stanford University in 1970 to join the Spencer Foundation we talked at length about how a foundation with modest resources might be most effective in the improvement of education. We had noted the pendulum-like swings of interest so characteristic of the world of education and decided that one way to be useful was to try to find a countercyclical position from government funding. With government funding at an all-time high for studies and assistance to the handicapped, the disadvantaged, and the variously deprived child, we were pleased to find early opportunities to fund studies of the mathematically and scientifically precocious, as well as the verbally and humanistically gifted children. Last year after our first six years of operation we asked a distinguished scholar of the field to review our investments in studies of the gifted. He noted that the field of talent study virtually had been dormant, and pointed out three

[2]EDITORS' NOTE: Dr. Sisk was asked to write a position paper that would serve to close the discussion by integrating various viewpoints.

[3]EDITORS' NOTE: The organizer and chairperson of this symposium was Julian C. Stanley.

independent events that suggested it sprang to life again in the early 1970s. "The first was the development of the Study of Mathematically Precocious Youth at The Johns Hopkins University by Julian C. Stanley and his colleagues. The second was a bequest to the American Psychological Foundation by Mrs. Esther Katz Rosen, who directed that the income from the endowment should be used for the study of gifted children. The third was a too-long-delayed follow-up of the Terman gifted children in 1972." Since then other indicators of reviving interest are appearing, notably the Social Science Research Council's series of conferences that may be indicating a sustained interest by that illustrious body in the study of talent, and a recent "Tuesday Morning at the White House" discussion of giftedness, which in turn may signal more funding from government sources for this field of study and practice.

Our society is deeply ambivalent about its two most fundamental values, liberty and equality. On the one hand we argue for the libertarian right of each individual to develop his or her capacities to the highest possible level. On the other we argue for the egalitarian right of equal opportunity for all. In recent decades the egalitarian emphasis, especially in the political arena, seems to have gained. Yet we live in a vastly complex technological society with insatiable demands for talented people to keep it running. Talent does not develop in a vacuum; it needs nurturing, and to ignore its nurture is to imperil our way of life.

Elbert Hubbard once said, "There is something that is much more scarce, something finer far, something rarer than ability. It is the ability to recognize ability." I am most happy to be in this company, where at least we are learning better ways to look for the very able, and perhaps how best to recognize and nurture great talent. I look forward with great interest to the discussion to follow.

STANLEY: Thank you, Dr. James. We go now to the first group of panelists, those who will give background on the gifted and the creative. The first speaker in that group is a distinguished educator from the University of Chicago. One would have to be extraordinarily insensitive to educational trends not to have heard repeatedly of Robert J. Havighurst over the years. We are especially pleased to have him on the program, because he is one of the true pioneers in facilitating the education of intellectually gifted youths. Dr. Havighurst:

THE GIFTED AND THE CREATIVE: ACCELERATION OR ENRICHMENT?

Robert J. Havighurst

In order to discuss this topic usefully, we need both a quantitative and a qualitative definition of the group of children and youths to whom we refer. If we use a broad definition of the "intellectually gifted," we might speak of 10 percent of an age cohort, or some 350,000 boys and girls of a given age. In that

case, most educators would say that the emphasis should be upon enrichment of the educative experience, with perhaps as much as a one-year acceleration in progress through the school grades. But *we* must use a much more selective definition.

Following Stanley, we may speak of the "intellectually talented" as a subgroup of those 12- and 13-year-olds who score in the top 5 percent of their grade on national norms in both mathematical and verbal reasoning. Those boys and girls then take the College Entrance Examination Board's Scholastic Aptitude Test (SAT), and some 10 percent of them score higher on this test than does the average college-bound male twelfth grader. Thus we select about 0.5 percent of the group who at age 12 or 13 are "intellectually talented" in mathematics—that is, the top 1 in 200. If we add another equal-sized group who score equally high in science but not so high in mathematics, we get about 1 percent of the age group, or 35,000 boys and girls whom we define as "intellectually talented."

For this group I would argue that three or more years of acceleration by the age of about 15 are useful. That is, this group might enter college as freshmen at the age of 15, or with sophomore standing at the age of 16. This would assume that these youngsters had completed high school level courses in mathematics, science, and English, or had passed examinations for such courses. As for enrichment, this group probably would have experienced some of what Stanley calls "relevant" enrichment, which would encompass special work in mathematics or science or some other academic subject area in which such students were specially interested.

For those young people in the top 10 percent on tests of knowledge and aptitude, who are often called "gifted" but are not in the top 1 or 2 percent, I would argue for what Stanley calls "cultural" and "relevant" enrichment plus one or two years of acceleration. The acceleration might be gained by skipping one or more grades, or by taking "advanced placement" courses in high school that would permit entrance to college with up to a year of college credit.

This would leave those just below the top 1 percent in a category that would be treated according to their social maturity and motivation for academic work.

The contention of many educators who oppose "radical" acceleration on the ground that it may damage the social and emotional development of the students who are accelerated is an important issue. Often there are disadvantages to academic acceleration of three or more years, especially during early adolescence, and these must be weighed against the disadvantages to intellectual development of "holding back" a gifted student.

The pros and cons of acceleration should be explored by any conscientious educator, perhaps by reading the case studies of young people (Hollingworth 1942; Hildreth 1938, 1954; Strang 1956) and also by reading the few autobiographies that are available. An especially good autobiography is that of Norbert Wiener (Wiener 1953), the mathematician who was a child prodigy and was ambivalent about his boyhood experience. The autobiography of John Stuart Mill (Mill 1908) and his biography by Packe (1954) also are useful in this connection.

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STANLEY: Thank you, Dr. Havighurst. I am delighted that Bob has pointed out that educational acceleration is a matter of degree rather than just a qualitative difference. At the Johns Hopkins University in May of 1977 five very young persons received bachelor's degrees, three of them at age 17, one at age 18, and one at age 19. They accelerated anywhere from three to five and one-half years. At one of the more distinguished New York City colleges, a young man who became 15 years old on 24 March 1977 received his B.S. degree in mathematics, summa cum laude. His accomplishments included a three-year National Science Foundation graduate fellowship and an almost perfect score on the Graduate Record Examinations in advanced mathematics. All degrees of acceleration are represented on a continuum ranging from moderate acceleration to great acceleration. So far as we are concerned there are no magical or mystical gaps in that continuum.

The next speaker on the general panel of "The Gifted and the Creative" is a distinguished worker and professor in the field of gifted-child education who is closely associated with the administrative and executive responsibilities of the Association for the Gifted (TAG), which is a division of the Council on Exceptional Children. He is the past editor of a newly emerging journal published by the Association for the Gifted, called *Talents and Gifts*. He is the publisher and founding editor of a much-needed new journal for parents and teachers called *G/C/T* (Gifted/Creative/and Talented Children). I am pleased to present Professor Marvin Gold from the University of South Alabama. Dr. Gold:

ACCELERATION: SIMPLISTIC GIMMICKRY

Marvin J. Gold

Often I am asked "Why hasn't gifted-child education progressed any faster than it has?" I usually respond, "There are several reasons, undoubtedly, but I am certain that heading up the list is overdependence on one or another of three

words: enrichment, segregation, and acceleration.'' Adherents of each term have in their way done much to slow the progress of gifted-child education.

The problem with the term *enrichment* is that it conveys no meaning. Indeed, as one administrator opined, ''Enrichment is that term educators hide behind when they don't want anyone to know they are not doing anything for the gifted.'' To some, enrichment means learning to type in the fourth grade; to others, mastering Haiku; to others still, it connotes twenty spelling words instead of ten, two compositions in lieu of one.

Segregation implies the setting apart for all or part of a day, a year, or an academic career. It could be partial or it could be total.

Acceleration refers to some form of ''speeding up'' (e.g., early admissions, double promotions, ungraded primaries or junior high schools, entering college early). A wide variety of options is possible.

When one talks about the educational value of the above three alternatives (and from this point on, I shall confine myself to the concept of acceleration only) it is like talking about the value of a hammer: straight against a nail into one beam to be joined to another there is some significant value to the hammer's effect; against an infant's skull, the hammer's drive would be of questionable worth. The problem then lies not in the tool, acceleration, but in the product to be built, curriculum.

Unfortunately, too often school administrators seize upon an overly simplistic approach to gifted-child education and look for an administratively manageable answer. Grabbing hold of acceleration, a ''how'' device for implementation, it is quite easy to forget the ''what'' of the educational effort, the curriculum.

Complex concepts such as futurism, productive thinking, creativity, leadership training, critical thinking, and the like all become second-class citizens in the educational country where quick simple answers are likely to rule unchallenged.

I am not against acceleration any more than I am against the hammer or motherhood or the flag. Decent parenting or a flag that has meaning are certainly most worthwhile, as worthwhile as is acceleration that moves a gifted child's education forward meaningfully. Biological motherhood or phony patriotism, however, is as meaningless as the ''speeding up on something'' that has little value within the world of education.

Let's attend to the ''what'' of education first and look at the implementing methods, the ''how,'' second. Otherwise, we are forcing ourselves to live with some form of simplistic gimmickry.

STANLEY: Thank you, Dr. Gold. One person who was unable to attend is Professor Joseph Renzulli of the University of Connecticut, who has been instrumental in defining the term *enrichment* and its implications. It is quite unfortunate that Joe is not with us, because he has written extensively on the meaning of enrichment. [Dr. Renzulli provided the editors with the following position paper concerning educational acceleration.]

SOME CONCERNS ABOUT EDUCATIONAL ACCELERATION FOR INTELLECTUALLY TALENTED YOUTH Or ARE TREADMILLS REALLY DIFFERENT IF WE RUN THEM AT A FASTER RATE?

Joseph S. Renzulli

Although it would be foolish to argue against acceleration as one potentially valuable approach for meeting the needs of intellectually gifted youth, I have a few basic concerns about this practice and therefore would like to suggest a great deal of caution and selectivity in its use. It is certainly not a panacea for meeting the needs of all gifted youngsters and, in fact, under certain circumstances it may fail to respect some of the characteristics that bring gifted and talented persons to our attention as creative and productive individuals.

My major concern about acceleration is that it does not represent a radical or imaginative departure from the usual type of educational programming provided for almost all youngsters in the vast majority of their learning experiences. In other words, acceleration is basically a means for quantitative rather than qualitative differentiation.

Let us begin by analyzing briefly a typical learning situation. Almost all traditional learning experiences are characterized by the step-by-step pursuit of curricular material that is planned and administered by the teacher. Students engage in predetermined exercises with generally prescribed procedures for problem solving and generally agreed upon standards of acceptability for success. Thus, the curriculum from the early grades through most college-level courses consists of one long progression of exercises, and the student is cast mainly in the role of an "exercise learner." Needless to say, many exciting and potentially worthwhile experiences can emerge from this traditional approach to instruction. It is important, however, to keep in mind that there are at least a few alternatives to a constant and continuous diet of prescribed and predetermined exercises.

Now let us take a look at the practice of acceleration. My main concern here is whether or not we are removing youngsters from one exercise-learning situation and placing them in another similar situation, albeit at a somewhat more advanced level. Unless appropriate modifications are made in the *ways* in which advanced courses are taught, the student still is cast in the role of exercise learner. If such courses are planned and administered by the teacher and if they consist mainly of a succession of prescribed and presented exercises with agreed-upon solutions, then I fail to see how an accelerated course differs qualitatively from the regular curriculum. To paraphrase Gertrude Stein, "A course is a course is a course."

Placing youngsters in advanced level courses obviously respects a very important characteristic of the learner. This characteristic is a more quickly developed capacity to comprehend material, to deal with higher levels of conceptualization and abstraction, to process larger amounts of information, and to

reach higher levels of generalization more rapidly and with greater degrees of understanding than does the learner of average ability. Though these certainly are admirable goals for intellectually gifted youngsters, two additional dimensions of the learner must be taken into account if we are to have total respect for *all* of the capacities of gifted and talented persons. The first of these dimensions is sustained interest in a particular discipline, topic, or even a single event. As an instructor marches along from one exercise to another, putting students through the hoops that are listed on the course outline, I wonder if there is sufficient time or opportunity for an individual student to pursue a particular topic that may provoke an unusual personal interest.

A second dimension of the learner that should be respected in qualitatively different educational situations is the preferred learning style of the individual. This dimension is concerned with the way(s) in which a person would like to become involved with certain topics. Being involved as an exercise learner is the *sine qua non* of most course-oriented situations, and it is the rare course indeed that allows an individual to investigate a topic in a manner that approaches *real* inquiry about *real* problems.[4] Gifted persons who have attained recognition in their respective fields almost always have been characterized by high levels of task commitment that have been brought to bear on real problems. If educational institutions are to approximate the *modus operandi* of truly gifted individuals, then learning opportunities must go beyond mere course work (however advanced), and these opportunities must be characterized by experiences that are in direct opposition to presented exercises.

Acceleration has many obvious values, especially in the acquisition of basic concepts, investigative methodology, and the fundamental principles of subject-matter areas. This is especially true for areas that are highly structured and sequential in concept complexity such as mathematics, computer programming, and physics. But unless additional provisions are made for individual investigative activity, then I am afraid that we are guilty simply of turning up the rate of speed on the exercise treadmills.

STANLEY: Another person who was not able to come because of other commitments is Professor Halbert Robinson of the University of Washington at Seattle. Hal has a fascinating program for finding intellectually brilliant youngsters in the preschool years and studying them longitudinally to see what they and their families are like and how they develop. We are fortunate to have as a substitute for Dr. Robinson a person working directly in his laboratory with these youngsters, Dr. Nancy Jackson:

[4]Space does not permit a detailed discussion of what is meant by "real inquiry" and "real problems." The interested reader is referred to Renzulli, J.S. 1977. *The enrichment triad model: A guide for developing defensible programs for the gifted and talented.* Wethersfield, Ct.: Creative Learning Press.

PLACEMENT ACCORDING TO READINESS[5]

Halbert B. Robinson, Nancy E. Jackson, Wendy C. Roedell

Few fundamental principles of human behavior are as logically compelling and empirically verifiable as the dicta (1) that learning is facilitated by an appropriate match between the material to be learned and the learner's level of relevant cognitive organization; and (2) that there exist substantial differences in performance on any learning task among individuals of the same chronological age. The notion that each child is, at any given moment, ready for some kinds of learning experiences and not for others is obvious. Equally incontrovertible is the notion that such readiness is correlated imperfectly with chronological age.

Sensible educational programs certainly must take cognizance of these fundamentals. Many do. Those with a single, well-defined goal (e.g., to teach children to swim, play a musical instrument, or speak a foreign language) rarely give much prominence to chronological age. Learners generally are grouped by competence, and tasks typically are tailored to their levels of mastery. A ski instructor who placed all 6-year-olds in Snowplow I and all 12-year-olds in Advanced Parallel soon would learn the error of his or her ways.

It is, rather, the broadly based educational programs with multiple, often ill-defined goals, that magnify chronological age as *the* major criterion for class placement. As goals of the educational enterprise have proliferated, the age-graded lock step increasingly has become the norm. Without denying the complexities of the issues involved in our efforts to deal with the "whole child," and indeed the "whole society," we have been blinded to a broad range of intra- and inter-individual differences; we often fail to see specific and easily defined trees because we are so busy examining ambiguous forests with ill-defined boundaries.

The Child Development Research Group at the University of Washington has undertaken a set of projects concerned with identifying and nurturing young children who display extraordinary intellectual abilities. By age 5, the usual criterion for kindergarten entrance, a typical child in our program is reading at the level of the average fourth grader and is about as proficient in mathematics as is the average beginning second grader. This child's fine-motor skills are average, and his or her social skills also are judged to be about average. To place this child in an average kindergarten surely would lead to inappropriate matches with respect to some important areas of development; placing him or her in the third or fourth grade would lead to equally distressing mismatches with respect to other important areas.

Although difficult, the problems posed by intra- and inter-individual differences are not impossible to resolve. Other speakers today have reviewed the evidence on such topics as early admission, enrichment, and acceleration. The

[5]While Dr. Jackson presented this paper at the symposium, it represents not only her position but also that of her two colleagues, Drs. Robinson and Roedell.

overwhelming weight of the evidence indicates that placement according to readiness rather than age facilitates learning as well as the general adjustment of the children. We cannot, of course, pretend that we know all that we need to know about the long-term social, emotional, and cognitive consequences of placing children according to indices of readiness. The data, however, have been consistently encouraging.

A final thought concerns the formulation of the topic we are here to discuss: the educational acceleration of intellectually talented youths. I wonder why we are concerned with the idea of acceleration at all. I have never known a gifted child whose education in the area of his or her "gift" seemed truly accelerated. I have known a very few such children lucky enough to have parents and teachers who allowed them to proceed at their own pace, but most have had to deal with systematic, and, I think, unconscionable attempts to *decelerate* their education. The costs of such practice to the children and to society, I believe, have been very substantial. I submit that we should at this point be attending to the detrimental effects of continuing to decelerate the educational progress of intellectually talented young people.

STANLEY: Thank you, Dr. Jackson. Incidentally, when the Spencer Foundation began a few years ago, one of its first actions was sponsoring the Study of Mathematically Precocious Youth that we run at Johns Hopkins, later Lynn Fox's Intellectually Gifted Child Study Group, and also this important project at the University of Washington.

The next speaker earned her Ph.D. in social psychology at Harvard University. She is a staff member of the Social Science Research Council as well as the staff associate there who works with the committee on gifted children that the Social Science Research Council recently set up with some of the income from the Rosen bequest that Dr. James mentioned. We are delighted to have Dr. Alvia Branch with us today. Dr. Branch:

SELECTION OF APPROPRIATE CRITERIA AND COMPARISON GROUPS FOR USE IN THE EVALUATION OF EDUCATIONAL PROVISIONS FOR THE GIFTED AND TALENTED

Alvia Y. Branch

This paper does not take a position with respect to the superiority of either acceleration or enrichment as a means of providing for the educational needs of gifted and talented students. Rather, it points to research and evaluation that are needed to assist teachers, administrators, and parents in making better-informed choices between these alternatives. Because acceleration (particularly the "radical" acceleration of relatively young students) has met with the greatest resistance and, in this sense, bears the greatest onus of proof, most of the comments

contained herein are directed toward issues related to the educational acceleration of gifted and talented students. The major argument to be presented is that many individuals involved in assessing the effectiveness of acceleration have chosen strategies that are overly conservative in view of the intensity of the resistance they must counter. This conservatism is reflected both in the selection of comparison groups and in the selection of criteria for use in determining the extent to which successful educational facilitation has been achieved.

When we consider that the image in need of correction entails lives horribly distorted in service to the development of a single "gift," comparisons of the academic achievements of accelerated students versus those of (1) their classmates and (2) their agemates (both unselected for ability) do not constitute a sufficient counter. Equal or greater academic achievement among the accelerates might be expected solely on the basis of intellectual ability. Yet, most research into the effects of acceleration has made precisely these comparisons, belaboring a point that many opponents would be willing to concede. The only comparison potentially capable of generating data that can chip away at the bulk of resistance to acceleration is a comparison between comparably "gifted" students, accelerated and nonaccelerated. It seems feasible to make such comparisons in terms of scientific requirements and in terms of ethical considerations. Because of the scarcity of funds, many gifted students (regardless of ability levels) will not be exposed to qualitatively different and appropriate educational experiences. It is therefore appropriate to monitor the development of both groups, those who are and those who are not receiving such provisions, and then to make relevant comparisons of their experiences. Only in this way can credible statements be made concerning the effectiveness of any intervention, whether enrichment or acceleration.

In addition to the correct comparison group, one needs to be concerned with the question being asked of the comparison. With respect to the criteria used in determining the success or failure of an intervention, many studies have employed one or a combination of the following: (1) ability to master courses in advanced subject matter, (2) demonstrations of "no psychological damage," and (3) demonstration of a high degree of participation in extracurricular activities. Of these, the latter two come closest to confronting the essence of the resistance. In order to increase the likelihood of greater acceptance of acceleration as a means of providing for the educational needs of the intellectually talented, however, one needs to go beyond the demonstration of "no psychological damage" toward demonstrating psychological benefit in excess of risk. The type of study indicated would follow closely the lives of children identified as gifted regardless of whether they were subsequently successful, and would allow the researcher to do both of the following:

1. Investigate the possibility of substantially damaging effects resulting from lack of attention to the educational needs of the gifted. In order to be most convincing, an investigation of this kind would involve comparisons of accel-

erated and nonaccelerated gifted students, or gifted students whose educations have or have not been facilitated. As it stands, available biographical data on the lives of geniuses or prodigies most often recount triumph in the face of lack of attention to their special needs.

2. Look explicitly for positive effects of an accelerated or otherwise facilitated education. The emphasis of studies of this kind should be on in-depth analyses of personality and social variables thought to be associated with movement toward the fulfillment of potential. Again, comparisons would be made with students of equal ability whose educations have not been facilitated.

Clearly, Terman and Oden's discussion of the experience of the As (most successful) and Cs (least successful) among the men in the sample (see Oden 1968) approximates the kind of study being advocated here. Future studies along these lines, however, would be designed with sufficient controls to permit confident attribution of outcome differentials to the effects of acceleration.

Reference

Oden, M. H. 1968. The fulfillment of promise: 40-year follow-up of the Terman gifted group. *Genetic Psychology Monographs* 77 (First half, Feb.): 3–93.

STANLEY: Thank you, Dr. Branch. Those are important methodological and theoretical considerations. We all know that the typical attitude of the public toward the gifted for hundreds of years has been to expect almost impossibly great performances from them, to fault special treatment when even a single exception to the rule of good development comes up, and (as Dr. Branch points out so cogently) to preserve the status quo by not worrying about how stultifying that might be. The problem of the control group always has been great and always will be great in research of this kind. Even a series of seemingly definitive studies will not convince certain groups of people that they are wrong, however, because those persons have an emotional commitment to their stereotypic attitudes. On the other hand, such studies presumably will help spike some of the more irrational arguments as "arguments" and perhaps will help some persons who really are uncertain to make up their minds about the situation. Terman led the way in this endeavor.

The final speaker on the general panel concerning the gifted and creative is a remarkable young man who is a fourth-year doctoral student in psychology at Johns Hopkins, having come there from a bachelor's degree in psychology at Yale four years ago. He found time, at great personal sacrifice, to do a comprehensive background paper for this symposium covering hundreds of references in the area of giftedness with special attention to acceleration and enrichment. [See chapter 2.] Mr. Stephen P. Daurio:[6]

[6]EDITORS' NOTE: Mr. Daurio currently is an assistant professor of psychology at the Staten Island Campus of St. John's University.

EDUCATIONAL ACCELERATION OF INTELLECTUALLY TALENTED YOUTHS

Stephen P. Daurio

The controversy over whether to enrich or to accelerate the education of intellectually able students appears to be an artifact of chronological age grading in American schools. The question arises, "What if students were grouped according to mental age or special abilities instead of chronological age?" A likely outcome would be the end of the enrichment-acceleration debate because, theoretically, all students would be working according to their level of intellectual ability rather than at an assumed ability level based on chronological age. Why then has this seemingly obvious solution not been adopted?

The answer apparently lies in the following two considerations. First, educators tend to associate age grading with educational reform and to support the idea that it is better for children to interact with same-aged peers in school and in play. According to the historian Joseph Kett, who served on the President's Science Advisory Committee in 1974, age segregation started in the mid-nineteenth century as a *by-product* of the educational reform movement led by Horace Mann and Henry Barnard (Kett 1974). Similarly, age grading was coincidental with American industrialization and antedated the rising tide of immigration by only a few years. Age grading also was well suited to the Americanization of immigrants' children, following the great "melting pot" tradition. Moreover, during times of economic prosperity educational certification offered a kind of ticket for upwardly mobile poor children. Elementary schools, and later high schools, provided practical training demanded by increased specialization in industry. Conversely, during the depression of the 1930s, age grading was defended as a "cure" for unemployment. Thus, despite the fact that many educators believed over the years that age grading served the best interests of educational reform, the fact remains that age grading also served the *economic* and *political* needs of a growing nation. Since it is difficult to disentangle these utilitarian goals from better-intentioned goals such as reform, the value of the age grade lock step has yet to be proved for today's students. Considering the relative recency of this "tradition," that is, approximately one hundred years or less, the value of age grading is called into question even more.

The second observation involves educators' excessive concern over potential social and emotional maladjustment following acceleration. It seems a disproportionate amount of caution vis-à-vis acceleration stems from the rather unfortunate case of William James Sidis; Leta Hollingworth (1929), Catharine Cox Miles (1946), and, more recently, Kathleen Montour (1977, 1978), and H. Zuckerman (1977) have documented counter-examples of successful prodigies whose lifetime adjustments and professional careers were outstanding. In addition, the ongoing Study of Mathematically Precocious Youth at The Johns Hopkins University (Stanley 1976, Keating 1976) reports successful college experiences for over ninety-five young men and women who entered college at least one and as

many as seven years early. In fact, a recent extensive review of the acceleration literature failed to turn up a single substantive study that refuted the appropriateness of acceleration for intellectually able youngsters who were eager to move ahead at rates faster than the conventional lock step would allow.

Educators' concern over social and emotional adjustment also might be due to what Frank Laycock (1964) calls their "selective" use of evidence despite the wealth of "representative" literature supporting acceleration. According to Laycock, "Administrators have reported the cases they remember best, while psychologists have insisted upon good samples." In other words, administrators' reluctance to endorse acceleration may well simply reflect their individual biases in this matter.

Whatever the reason acceleration meets opposition in schools, the unwarranted disregard of empiricism concerning the effects of acceleration ought not jeopardize the education of intellectually talented youths.

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STANLEY: Thank you, Mr. Daurio. Steve was an integral part of the Study of Verbally Gifted Youths (SVGY), conducted at The Johns Hopkins University from 1972 to 1977 with support from the Spencer Foundation. That study was independent of Lynn Fox's Intellectually Gifted Child Study Group (IGCSG) and also of the Study of Mathematically Precocious Youth (SMPY). Although we have interacted over the years, the studies were conducted and funded separately.

SVGY did not continue beyond 1977, so SMPY and IGCSG have taken over some of the verbal component.

Having heard six speakers, we now have a few minutes for some interaction among them before going on to the next panel. The speakers, as you recall, were Drs. James, Havighurst, Gold, Jackson, and Branch, and Mr. Daurio. I will ask first if any member of that particular panel has a comment that he or she would like to make about any other paper presented by a panel member. Dr. Havighurst:

HAVIGHURST: The papers presented to this point in the symposium are concerned somewhat with the problem of social and emotional development. It seems to me that anybody who is tending strongly toward substantial acceleration, that is acceleration of three or more years for the highly talented youth, ought to read the life stories of as many past prodigies as possible. I read quite a lot about John Stuart Mill, who was reading Latin at the age of 5, and about Norbert Wiener, one of the relatively contemporary prodigies who eventually became a professor of mathematics at MIT and developed the science of cybernetics. Both of these people achieved high levels of success. But I must say, however, as I read their autobiographies, I had the feeling that they went through a lot of difficulty during the first ten to twenty years of their lives. I wonder if there is any possible way of helping such people to avoid some of the problems of social and emotional adjustment. I remember reading that Norbert Wiener was picked on a bit by the other children when he was 8 years old and in the sixth grade in one of the suburbs of Boston. He said that his motherly teacher would take him on her lap in this sixth grade and start comforting him in front of the class. He didn't know what to make of it at the time (I guess in a way he appreciated that motherly attention). You can see, however, his problem of interacting with people five or six years older than he, when he was treated this way. It is certainly not an easy experience to grow up socially and emotionally when one is that far advanced intellectually.

STANLEY: Thank you, Dr. Havighurst. There seem to be two types of prodigies, the pushed, propelled, programmed type of which Mill, Wiener, and Sidis are great examples, and the largely self-propelling types such as those with whom we work at Johns Hopkins. The latter don't get much strong, systematic facilitation during the early years. We are fortunate to have on the panel today the mother (Joan Stark) of one of the three 17-year-olds who will graduate from Johns Hopkins in May of 1977 (with a three-year graduate National Science Foundation Fellowship) and who are beginning distinguished research careers already. Her son, Eugene, probably is not a highly programmed person except in the general sense of being from a bright, cultured family. You will hear from her later. In the meantime, Dr. Thomas James has a comment. Dr. James:

JAMES: I'd need to know a lot more than I do now about the discomforts of the normal child during that period of development, before I could get greatly concerned about the issues Dr. Havighurst has raised.

STANLEY: It is interesting that if you read Packe's biography of John Stuart Mill, you'll find that the somewhat dyspeptic, middle-aged Mill remembered his

childhood incorrectly. As Packe finds it, the evidence from Mill's childhood is that he was a rather happy youngster, but Mill's report seems to have been colored by fatigue, his wife's death, and other midlife crises. Dr. Nancy Jackson:

JACKSON: My reaction is similar to that of Dr. James in that I would like to know not only more about the recollections of childhood that the normal child might have, but also the recollections of the extremely unusual person such as Wiener or Sidis, whether or not they were accelerated. I think that the problems they experienced may have been independent of their acceleration and may have come from being very different from the normal run of people. When we are relying on case-study literature, we can't separate these two things.

BRANCH: I also would like to point out along those same lines that we have a very select body of material. We have autobiographies of those people who made it; the autobiographies of those who were defeated at some point along the way are not available to us, so we don't really know how to interpret these experiences. We need to know more about the experiences of those people who aren't quite so prodigious, for example, those within the upper 5 percent. We really know a lot less about them than we do about the very spectacular cases.[7]

STANLEY: The recent biography of Sir Francis Galton[8] shows that he had almost the same identity crisis at age 20 that John Stuart Mill had, but that his upbringing had been substantially different in many respects from Mill's. Perhaps, a function of great intellect is having to come to terms with oneself at some time in the developmental process. Before Freud, geniuses were allowed to have a nervous breakdown every now and then and just go take a rest cure at one of the inexpensive spas to get over it. The great physicist Max Born and his wife had them rather regularly throughout their lives.[9] It was expected that people who led complex, difficult, hard-pushing lives would cave in psychologically occasionally. Nowadays one doesn't dare do it, for fear of falling into the "Eagleton" syndrome—that is, of being considered mentally ill. Mr. William George:

GEORGE: I think another important consideration must involve what might have been, had the person *not* been accelerated. Studies carried out in the 1950s by the Fund for the Advancement of Education of the Ford Foundation show that although there were some problems of initial adjustment in entering college early, these were temporary. In addition, these problems were no different in magnitude from adjustment problems encountered by the typical college student. Mr. Daurio's point about eagerness to move ahead is well taken. Almost all of the accelerative options developed by SMPY involve a bridging mechanism between junior high school and college, with eagerness a primary self-selection criterion. I think one also has to look at what the consequences of a solution

[7]EDITORS' NOTE: Kathleen Montour has followed up some less-famous prodigies and found that, by their own standards, most of them led successful lives. See references for Montour listed at the end of chapter 1.

[8]The reader is referred to Forrest, D. W. 1974. *Francis Galton: The life and work of a Victorian genius*. New York, N.Y.: Taplinger Publishing Company.

[9]EDITORS' NOTE: See Born, M. (ed.). 1971. *The Born-Einstein letters: The correspondence between Albert Einstein and Max and Hedwig Born, 1916–1955*. New York: Walker and Company.

might be if a youngster hadn't accelerated. Educational acceleration may not be a perfect solution, but what would have been the options or alternatives for that individual if he or she hadn't moved ahead? They may have been much more restricting and harmful.

ANASTASI: There is a hazard in putting too much emphasis on the published biographies of eminent people. There are bound to be selective factors in the publication itself. A person who is very talented, who has achieved eminence, and who also was very maladjusted, is much more newsworthy; he or she has more dramatic appeal than the person who wasn't maladjusted. This applies both to an author who decides to write a biography (his or her own or someone else's) and to the publisher who chooses the more newsworthy characters for publication.[10]

STANLEY: The next panel group consists of people who work in school systems. The first speaker is Dr. Elizabeth Kearney, who is the coordinator for the Mentally Gifted Minor program in the Pasadena, California, public schools. Liz is extremely well qualified for that position and has had a great deal of experience in an unusually favorable environment where there is a longstanding tradition of caring for the gifted. Dr. Kearney:

ACCELERATION: A VARIED APPROACH

Elizabeth I. Kearney

The term *acceleration* has triggered emotional responses for a number of years. Yet, there are numerous ways to accelerate the learning process, and many of those methods are supported by the same individuals who voiced a reluctance to "accelerate a child." Because semantics plays an important role in this issue, many educators in California avoid using the term while actually implementing the process.

Dr. Julian Stanley stated that academic acceleration allows students to advance through subject areas at a rate that may, or may not, alter their progress through the grade structure. With this view in mind, directors of programs in California have tried to provide many channels of acceleration for the identified gifted (California State Department of Education 1971).

Pasadena introduced its first class for the gifted at the Grant School under the direction of Miss Grace Ball (Director of Special Programs) the year after the first volume of Lewis M. Terman's famous *Genetic Studies of Genius* appeared—i.e., in 1926 (see Kearney and Brockie 1978). The teachers stressed an educational process that allowed students to explore in depth and at advanced levels those areas in which they were academically accelerated while keeping

[10]EDITORS' NOTE: But see references for Montour listed at the end of chapter 1.

them with their chronological peers for the major portion of the school day. Grant School was staffed by teachers willing to serve as facilitators and mentors, and, according to Miss Celia Johnson (one of the first teachers in the program), "The children were happy, and the parents endorsed the plan enthusiastically." Despite parental support, however, public pressure resulted in the school's closure in 1943. Subsequently, less isolating means were sought to provide for the needs of the gifted in the population.

The 1950s saw the end of another plan. The "6-4-4" plan provided a grade grouping (K–6, 7–10, and 11–14) that was most beneficial to the gifted because they could take classes one or more years beyond their grade level as a matter of course. Unfortunately for this new concept, community college districts formed and the plan disappeared.

By 1963 the state had set up a funded program for gifted students, and a research project funded by the Cooperative Research Branch of the United States Office of Education was underway. This $249,000 grant aided in the development and demonstration of special program prototypes. Model demonstration centers were established in six school districts. Materials and curricula were prepared to aid educators interested in providing acceleration, special classes, and counseling programs for the gifted. Project Talent (the title of the project)[11] ran from 1963 to 1966 in the Davis Joint Unified, Lompoc Unified, Los Angeles Unified, Pasadena Unified, Ravenswood City, and San Juan Unified school districts. The results were published in a series of booklets and subject-matter guides.

One of these publications, *Acceleration Programs for Intellectually Gifted Pupils* (Robeck 1968), set forth the results. The following report was made on the portion of the research program conducted in Pasadena: "The high achievement and the successful adjustments made by accelerants . . . confirmed the reports of . . . other studies. Standardized test results should be studied in relation to pupils' progress . . . to determine the level of academic talent needed for success in the program. Characteristics of pupils, such as motivation, that are not measured by standardized tests but which play important roles in pupils' success . . . should be identified for use as guides by those responsible for the selection of participants, . . . and the purpose and function of counseling should be delineated. . . ." It was noted that a follow-up study should be conducted, but unfortunately, none was.[12]

Money shortages promote innovation, and this is sometimes an advantage. The need to provide suitable educational opportunities, coupled with an inability to fund major projects, has resulted in programs that provide acceleration by permitting students to change courses, take Advanced Placement Program courses, enroll in advanced classes, do independent research, take seminars, work independently under the direction of mentors from the school staff and/or

[11]Not to be confused with John C. Flanagan's national longitudinal study.

[12]EDITORS' NOTE: The Study of Mathematically Precocious Youth is perhaps the first large longitudinal intervention study of this kind.

the community, be graduated early, and/or serve as career interns prior to graduation. By using a variety of approaches to acceleration, schools throughout California have been able to insure that the brightest of their students are being given an opportunity to receive an education truly designed to meet their needs.

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STANLEY: Thank you, Dr. Kearney. Our next speaker is from the New York City public schools. She coordinates programs for the gifted there. Dr. Virginia Z. Ehrlich:

ACCELERATION AND ENRICHMENT FOR THE GIFTED IN NEW YORK CITY PUBLIC SCHOOLS

Virginia Z. Ehrlich

With a population of over one million children, the New York City public school system has opportunities for educational experimentation that are available to few other communities, our major competitor being California, clear across the country. New York's concerns for the gifted are recorded as early as 1899. We had rapid-advancement classes shortly after that, in which two semesters of work were completed in one semester. It was in the New York City public school system that Leta S. Hollingworth conducted her studies for the gifted at Public School 500 Manhattan, known as the Speyer School. The practices of the city reflect Terman's position on acceleration, that such children should be promoted rapidly enough to permit college entrance by the age of 17 at the latest, and that a majority would be better off to enter at age 16.

A combination of both grade and academic acceleration seems feasible. In fact, this is the method the city has used successfully for many years, together with enrichment. The general policy states that it is not desirable to accelerate a child more than one year in elementary school and one year in junior high school. Acceleration at both levels often is accomplished by completing the work of two years in one. In the elementary school this usually occurs by combining grades seven, eight, and nine into a special-progress class that completes the work in two years. We used to have a three-year senior high school, Townsend Harris,

but it was discontinued, much to the regret of its alumni and prospective students. Early admission to kindergarten is not commonly practiced. Since 1974 the Astor Program, which I have directed, has introduced the practice of accepting gifted children to kindergarten at age 4 years, instead of at age 4 years and 8 months, as previously required. Currently, local school districts are considering extension of this practice into their regular procedures. Our specialized high schools, honors programs in our academic high schools, and special-skills programs in our vocational high schools all rely heavily on academic acceleration combined with enrichment. These programs also take advantage of the College Board's Advanced Placement Program examinations for obtaining college credit while the student, technically, still is attending high school.

Enrichment is practiced at all levels as well. At the elementary level, we have homogeneously grouped classes for the intellectually gifted, usually in grades four, five, and six and sometimes in grades one to three. Special pull-out programs in selected subjects also are available for many curriculum areas. At the junior high level special enrichment classes are homogeneously grouped. In these classes enrichment in the usual curriculum areas is provided; foreign languages are added to the curriculum. New York City's specialized high schools and honors programs provide many opportunities for enrichment within subject-matter areas or by including additional curriculum areas at higher levels of difficulty (very often at the college level). Of course, this may be considered academic acceleration as well.

Another facet of our public education system is summer and evening classes at the college level. This makes another type of acceleration possible. Plans for reducing the eight years of high school and college to six or seven years are being considered in many quarters. At the college and graduate levels, there is also a trend toward shortening the educational certification process. A few years ago, in cooperation with the New York Law School, City College undertook a program to accelerate the training of lawyers by reducing the seven-year sequence to six.

Like many cities in the country, New York City increasingly has resisted programs for grade acceleration. The disbanding of Townsend Harris High School, the limited use of acceleration in the elementary school, and the discouragement of accelerated special-program classes all are indications of the city's vulnerability to the prevalent opposition to grade acceleration, in spite of results of research studies that support the concept. It is my belief that lay response and resistance to the concept of acceleration in grade is based on uninformed emphasis on the sad lives that a few outstanding personalities have led and on our own inadequate presentation of the case for acceleration. We have not made clear the difference between the moderate acceleration recommended by Terman and others, and implicit in studies favoring acceleration, and the unnatural race through intellectual experience to which Mill, Wiener, Sidis, and others were subjected by their "pushy" parents. Nor do I think we have made clear the advantages of intellectual acceleration as it relates to the child's ability within the framework of the normal environment of age peers. The problem, in part, lies with the establishment's inability to restructure itself so that it can deal with each

student as an individual in terms of his or her unique patterns of capacities and needs.

STANLEY: Thank you, Dr. Ehrlich. The next speaker has pioneered in work with the National and State Level Leadership Training Institutes (N/S-LTI) on Gifted and Talented. Many of you are familiar with that far-reaching program. I present Dr. David Jackson:

A POSSIBLE ECONOMIC CORRELATION OF ACCELERATION FOR THE INDIVIDUAL AND FOR SOCIETY

David M. Jackson

It is the purpose of this brief paper to raise some economic questions about the consequences of acceleration both to the individual and to society in general. I believe the case for acceleration is well made in the research literature provided by Professor Stanley for this symposium,[13] and that our current need is for arguments to convince educators, parents, and others that they should act to assist larger numbers of well-qualified young people to move much more rapidly through the formal educational system. Thus, I seek arguments in the economic sphere in hopes of reducing professional and parental resistance to acceleration. What follows is an attempt to develop some economic arguments from possibilities that exist as a result of the operations of the Advanced Placement Program of the College Entrance Examination Board.

The Advanced Placement Program offers an existing practical means by which a boy or girl of high ability and achievement can accelerate his or her progress in formal education. Grades of "3" or better on three or more Advanced Placement examinations are sufficient in the case of many colleges and universities to support an offer of sophomore standing to the entering student.[14] How many 17-year-olds currently are using this method of acceleration? College

[13]EDITORS' NOTE: Before the symposium, panel participants were sent a packet of material that included the most substantive articles to date written about acceleration and enrichment as strategies for educating gifted youngsters. The articles included in the packet were as follows:

(a) Daurio (see chapter 2);
(b) Fund for the Advancement of Education. 1957. *They went to college early*. New York: Fund for the Advancement of Education of the Ford Foundation, pp. 60–91 only;
(c) Hobson, J. R. 1963. High school performance of underage pupils initially admitted to kindergarten on the basis of physical and psychological examinations. *Educational and Psychological Measurement* 23(1): 159–70; and
(d) Terman, L. M., and Oden, M. H. 1940. The gifted child grows up. *Genetic studies of genius*. vol. IV, chapter 20 (pp. 264–81).

[14]EDITORS' NOTE: Of course, an individual who plans to garner advanced standing credits for college via any of the nineteen or so Advanced Placement Program examinations that are offered nationwide each May needs to plan carefully in advance with the college(s) to which he or she applies. Standards as to what scores on which specific tests will *guarantee* credit vary from institution to institution, and often from department to department within an institution.

Board records support an estimate of 3,000 in 1976. If we assume that 2 percent, or 80,000 students of the age cohort of about four million could do so, the current rate is estimated at only 3.75 percent of that potential number.

What are some of the possible economic consequences of raising this number? Each individual who saves one year of college attendance, at an average cost of $7,500, and instead is gainfully employed for one year at a salary of $193 per week will pay federal income tax of a little more than $2,000. Thus, if the other 96.25 percent (77,000 students) of those capable of one year's acceleration followed this pattern, the federal treasury would gain $154 million. Gains to the 77,000 individuals ($7,500 in savings plus about $7,500 in net earnings) would amount to more than a billion dollars for the one year!

To specify the economic consequences of this pattern of acceleration precisely, studies are needed on questions such as these:

1. How many accelerated students work for a year before college? What is their employment experience, in terms of wages, types of work, etc.?
2. How many accelerated students enter the labor market after completing one or two degrees? What is their employment experience in terms of wages, types of work, etc.?
3. What is the incidence of frustration among students who are capable of using this method of acceleration, but who do not do so? In how many cases does frustration lead to dropping out?
4. Do accelerated students persist longer in graduate study than equally able nonaccelerated students?

There seems little doubt, however, that acceleration of the type cited leads to considerable redistribution of funds, to the advantage of students, their families, and probably society.

STANLEY: Thank you Dr. Jackson. We have been reminded repeatedly that we need good fiscal arguments for the value of acceleration, rather than the many arguments for getting more money to work with the gifted in special, expensive programs. Your brief analysis is eye-opening.

Dr. Frank Williams, an educational consultant in Salem, Oregon, was unable to be with us. We are fortunate to have as his substitute Mr. Leroy Owens, who is the evaluator of one of Dr. Williams's district projects in Anchorage, Alaska. Mr. Owens:

PROGRAMS FOR THE GIFTED AND TALENTED IN ANCHORAGE, ALASKA

Leroy Owens

I would like to share with you what Frank Williams would have said. In Alaska we borrow paid consultants through a talent bank. We asked Frank to

work with us in an evaluative position at the initiation of Anchorage's program for gifted and talented. What follows are some of the bad and good experiences we had at the beginning of that project. We share them in hopes that some of you might be able to interact with us and share some of your problems as well.

At the beginning of the program we felt strongly, and still do, that there is much we don't know about this area. Consequently, we can do considerable harm with our good intentions by attempting to help in regular classroom settings students who are in some distinct ways quite different from their peers. In Anchorage, we have tried to conceptualize a program that would give some continuity among the identification of students, the training of teachers, and the evaluation of the program. The large amount of research on gifted individuals has resulted in a list of multiple abilities that differentiate the gifted from typical learners. Special needs of the gifted are the result of their differentiating characteristics, and an analysis of these characteristics could provide a model for identifying, developing, and evaluating those persons who participate in educational programs designed for the gifted and talented. Programs for gifted students will be most effective in meeting their educational needs and nurturing high level abilities only if identification and selection criteria are related to development and treatment conditions. The latter, in turn, must be evaluated by appropriate procedures. While all students have unique needs, there are some generalizations that can be made about the needs that appear to be the result of multiple-ability giftedness. It is these generalized needs of the gifted that have served as an articulated model joining together selection with treatment and evaluation in our Anchorage program.

The project in Anchorage extends the earlier work of Frank Williams in which he analyzed characteristics and needs of talented individuals on two dimensions: cognitive versus affective processes; and, convergent versus divergent conditions. This general notion represents a common conceptual thread not only throughout the training program for teachers, but also in the identification procedures for students and the evaluation at the end of the program. We have identified seven characteristics from Williams's research. Three of them rest in the cognitive domain (fluid thinking, original thinking, and elaborative thinking); and four rest in the affective domain (curiosity, risk-taking or courage, complexity of challenge, and imagination or intuition). We are focusing on those seven student behaviors within a program that deals with three content areas (language, arithmetic, and science) in our pilot program.

There are nearly 2,000 students who could be identified as gifted, if we used the rather loose state guidelines that would allow us to identify up to 5 percent of our students. We felt strongly at the beginning of the program that no single existing test adequately could measure all the variables about which we were concerned. We identify students via a hierarchical process starting with nominations, followed by some very specific testing. Finally, a committee performs the actual selection using criteria that allow them to compensate for the weaknesses in the tests we use. As you can see, we still have a lot of difficulties with this process, but it's developing.

STANLEY: I'll not joust with the next speaker, an old friend and former graduate student of mine. You know her as a leading executive, professional, and author of a number of important tests. The School and College Ability Tests (SCAT) and the Sequential Tests of Educational Progress (STEP) were largely influenced by her. She is now senior vice president of the Educational Testing Service (ETS) and the director of its Southern office in Atlanta, Georgia. Dr. Scarvia Anderson:

SUPER STUDENTS, AVERAGE SCHOOLS

Scarvia B. Anderson

I remember a few years ago going to a junior high school in New York City to give a workshop on errors of measurement or something equally irrelevant—"irrelevant" in the face of more pressing problems for a school lacking a piano, books with copyrights later than the early 1900s, an adequate counseling staff, or any regularly credentialed mathematics teachers even in the so-called mathematics honors program. Notions that exceptionally able boys and girls would be identified there, much less the controversy of which is better, enrichment or accelerative opportunities for them, would be about as irrelevant as my workshop was.

Pianos and books are relatively easy to come by. Highly competent and dedicated personnel are not, especially in such a specialized field. Yet any large-scale provisions for the intellectually gifted are going to have to depend on the availability in, or to, local school districts of personnel with skills in measurement, counseling, guidance, instruction, and even public relations for the intellectually talented. Complementary personnel are needed with skills in the following:

1. early identification of extraordinary intellectual talent;
2. guidance for the talented toward appropriate activities in light of such factors as their levels of cognitive and emotional development, interests, and family pressures;
3. identification and development of internal and external sources of intellectual stimulation and enrichment for these students; and
4. provision of such intellectual stimulation locally in at least some educational areas.

Julian Stanley has said that teacher judgments of mathematical talent are woefully invalid. [EDITORS' NOTE: e.g., see Stanley 1976.] He and his colleagues have gone to their own formal and informal identification systems that are relatively independent of the schools. One suspects, too, that one of the reasons the SMPY staff is so dedicated to acceleration rather than enrichment is mistrust of the ability of many local teachers to provide true enrichment as opposed to "Mickey Mouse" activities. Acceleration offers greater opportunity for use of experts outside the system, or at least teachers acknowledged to be at higher levels within the system.

In addition to the problems of the competence of local school personnel to deal with highly gifted students, their families, and other institutions, there are also subtler issues on the local scene, issues of attitudes. It is well known, anecdotally at any rate, that some teachers feel threatened by students who are brighter in any respect than they are. In school systems where there are large numbers of low achievers, there may be resistance and resentment if money and effort are "diverted" away from those judged "most needy." In many communities, too, high achievers must contend with negative peer pressures and hostilities.

To summarize these brief remarks, as we discuss the role of school systems in furthering the development of intellectually gifted students, we must keep before us the realities of what the average school system *can* do now and temper our expectations for the future to the personnel and contextual problems that will have to be overcome if local environments for the gifted are to be invigorating rather than stultifying.

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STANLEY: Thank you, Dr. Anderson. The final speaker on this portion of the panel is a distinguished educational psychologist, the president of the Division of Educational Psychology of the American Psychological Association, and a former editor of the *Educational Psychologist*. He is Professor Ellis B. Page of the University of Connecticut, a measurement specialist. Dr. Page:

ACCELERATION VERSUS ENRICHMENT: THEORETICAL PERSPECTIVES

Ellis B. Page

Let us consider the issue of acceleration versus enrichment from some theoretical perspectives. When we do so I will argue that we find ourselves concerned with two of the most traditional problems of psychology. Furthermore, we may be on the threshold of some useful new understandings about them.

In thinking fundamentally about programs for the gifted, a dilemma exists if we take for granted that talents stem either from the genes or from the environment or from some combination and/or interaction of genes and environment. If talent comes from the environment (nurture), isn't it unfair to give the gifted any additional opportunities, whether by acceleration or enrichment? Doesn't this simply compound the basic unfairness of their already advantaged environment?

On the other hand, if talent comes entirely from heredity (nature), why are special programs necessary? That is, if the environment is unimportant in determining the outcome, then why do anything at all environmentally to accommodate individual differences? From this reasoning it seems that we can defend programs for the gifted best, if defense is our purpose, if we assume some combination of nature and nurture, and especially if we assume some interaction of nature and nurture. To be intellectually defensible, a program for the gifted must not be equally appropriate for the less gifted. Perhaps we can accept the following statement as a core agreement: the gifted are innately different in ability from the average, and this innate difference by itself is not adequate to assure their maximum contribution to society or to their own fulfillment. So, in a sense, we must be interactionists, if we believe in special programs. I mean *interactionist* in an especially technical, statistical sense.

As people interested in such programs, let us consider now a more parochial question. Which sort of help promises optimal achievement? Here we have run into problems that are both theoretical and practical. The most coherent and informed arguments against acceleration are based on the study of individual profiles, that is, when we accelerate a child by grade-skipping we typically promote the whole child; all of the gifted child goes to college, not just his unusual mathematical ability. It is quite true that our standard for inclusion of Mary in a program for gifted artists would not necessarily entitle her to inclusion in a program for gifted mathematicians or poets or historians. On the other hand, many of these more intellectual fields do correlate substantially with each other. Both test scores and grades for different areas of study show, in at least a moderately significant range, correlation matrices that are overwhelmingly positive. If we choose the top youngsters for their scores on the first factor in such a matrix, we shall indeed have students who are in the superior range for most academic subjects and who seldom fall below average in anything intellectual. The question remains, how superior? And how can we face the realization that during any specific educational experience we shall not have the ideal set of students at any moment in any practicable program, simply because of their profile differences? Gradually, we begin to see that we are dealing here with one of the most ancient problems in scientific psychology, second only to the basic nature-nurture problem of general ability. This is the problem of whether intelligence consists of one central trait or a cluster of many parts. In more technical jargon the problem becomes whether something like Spearman's g should be the central consideration, or whether something like Thurstone's primary mental abilities should play the central role in determining educational policy. In principle, pure g seems to argue for acceleration of the whole child. Purely separate traits seem to argue for enrichment to deal with the specific talent.

Since this is such a traditional problem we may well ask what new perspectives we can bring to it. Having faced the importance of the two major considerations, the nature-nurture of general ability and the separation of traits, I believe that now we are in an unprecedented position to cast light upon them. We have three

principal advantages over our predecessors: first, the availability of huge masses of test information; second, newly improved multivariate strategies and relatively inexpensive computer power; and third, emerging new methodologies in behavior genetics and related fields. This is no place to detail these advantages, but let me just cite one line of research. Workers at the University of Birmingham in England and elsewhere have been employing techniques involving identical and fraternal twins and various educational scores to test the hypothesis that performance on verbal tasks, for example, has genetically different sources from performance on mathematical tasks. The tentative evidence is that they are indeed differently loaded, however much they share a set of common gene loci. Other investigators have been developing strategies to break down the ordinarily observed correlation matrix into component parts to locate factors that are genetic versus those that are environmental in origin, rather than simply accepting phenotypic, that is the observed, correlations. At the University of Connecticut, in cooperation with researchers elsewhere, we hope to explore some of the largest sets of "twin" data ever examined, taking advantage of some advanced mathematical techniques to make our estimations. Again, these technical possibilities are beyond the scope of the discussion this morning.

My principal message here is that in gifted-child education we should not continue to ignore the fundamental question of the origin and structure of talents. The sooner we support research and achieve deeper insights into these origins and structures, the sooner we will be able to design rationally defensible and effective programs for these youngsters. These children represent the most important resource we have for developing future solutions to the complex problems that beset us.

STANLEY: Thank you, Dr. Page; a session such as this wouldn't be complete without some consideration of the nature-nurture aspects of talents. You have heard the second panel consisting of Drs. Kearney, Ehrlich, David Jackson, Owens, Anderson, and Page. Rather than hazard using all of the time for the panelists to interact with each other, I will start off with an invitation to members of the audience to address questions to any member of the panel who has spoken already.

JAMES ALTSCHULD:[15] My question is addressed to Mr. Daurio. In the research studies that you cited on acceleration, were the criteria the broader type that Dr. Ehrlich was describing in her talk, or were they the narrower types of criteria that Dr. Ehrlich suggested should be broadened?

DAURIO: The research literature that I reviewed included both psychological and educational research spanning at least the last fifty years. Within that category there is literature in specific areas, and literature in general areas.

[15]Audience questioner: James Altschuld, Ohio State University, Center for Vocational Education, 1960 Kenny Road, Columbus, Ohio 43210.

Acceleration is both broadly defined and narrowly defined, so both types were included. The studies that I mentioned, done by the three individuals (Leta Hollingworth, Catharine Cox Miles, and Kathleen Montour) were case histories of successful prodigies of unusual general intellectual ability, so they would be described as case histories based on the more narrowly specified criteria.

GEORGE ROSS:[16] I'd like to address Dr. Leroy Owens. In our school system as we sample students we ask them if they feel they are especially talented in certain areas. It is amazing the proportions of students who feel they are especially talented. What problems have you had in your program with those students who feel they are especially talented but who are not included in the program?

OWENS: We have a hierarchy for identification to allow all students who feel that they are gifted to identify themselves at the beginning. I think we do have a problem in being certain ourselves that we know what giftedness is. When we select even on the basis of a set of multiple criteria, the tests themselves become the definition of giftedness. I think that is too bad, because the tests we've used are not always the best.

RACQUEL S. MAVALAYSAY:[17] I would like to address this question to Dr. Branch. She suggests that there should be studies to probe possible damage to gifted children caused by inattention. This led me to wonder what kinds of cautions should be observed in such investigations to preclude any expectations from biasing the results. Since those who will be conducting the investigations are likely to be the same people who will be interested in finding evidence of damage, how will you control for their expectations?

BRANCH: This might be a stated objective in future studies. I don't maintain that it is necessarily the case that negligence of the gifted results in substantial effects. I do think that the studies that we have are selective. We have the case histories of those individuals who made it. We know nothing about the people who've exhibited some level of ability at some point and who later dropped out as they proceeded through the educational system. What I would advocate is a more adequate job of sampling people at an early point and following them through, whether or not they receive special attention. We won't know who will be facilitated or damaged at some later point in life, but broader sampling of people with initial ability will avoid biasing the outcome one way or the other.

BETTY WATTS:[18] A number of speakers made reference to parental and public reaction against acceleration or enrichment. I'm wondering if any of the speakers has knowledge of any systemic variation between ethnic groups in the United States with respect to attitudes toward acceleration or enrichment?

STANLEY: Not in terms of ethnic groups, but in terms of sex, because the

[16]Audience questioner: George Ross, Cedar Rapids Community Schools, Cedar Rapids, Iowa 52401.

[17]Audience questioner: Racquel S. Mavalaysay, Acadia University, Wolfville, Nova Scotia.

[18]Audience questioner: Betty Watts, Schonell Educational Research Center, University of Queensland, Australia.

propensity for radical acceleration through the schools among math-talented youths seems to be restricted largely to males.

HAVIGHURST: In the Terman study there were roughly equal numbers of men and women, but the "A group" perhaps contained men who wanted to achieve outstanding accomplishments. But such desires are not necessarily accelerative in nature.

STANLEY: One of the differences between our study and Terman's is that we go all out to offer educational opportunities. We have a "smorgasbord" of various educational accelerative possibilities, so when participants in our study don't accelerate, it is because they don't want to accelerate. Terman, on the other hand, was determinedly noninterventional except in fairly minor ways. He corresponded with youths who wrote him and occasionally he referred to them as his geniuses or the like, but he did not intend to change the pattern of acceleration. We really don't have substantial information on what happens when opportunities for considerable acceleration are created in various alternative ways according to the desires of the individuals concerned.

JAMES: There is an indicator in the traditional pattern of expenditures for the handicapped and the gifted in state legislatures, about $20 for the handicapped to $1 for the gifted. At the federal level it has run a little more sharply against the gifted, about $100 for the handicapped for every dollar earmarked for the gifted. One consequence of this expenditure pattern is a very deep value implanted in our society that we help the underdog but remain pretty wary of someone who has the initial advantage of intellectual talent.

STANLEY: We now go to the third panel, which will focus on the mathematical and physical sciences. The first speaker will be Mr. William C. George, who is the associate director and the only full-time staff member of the Study of Mathematically Precocious Youth (SMPY) at The Johns Hopkins University. He performs the managerial tasks and much of the consulting work. The others at SMPY are a professor (I), graduate students, and so forth, who are only part time. Mr. George:

ACCELERATION AND THE EXCELLENT MATHEMATICAL REASONER

William C. George

As specialists in educating the gifted, we recognize that no two individuals are identical. Learning rates, academic skills, ability levels, and social and maturational levels vary from individual to individual. Still, many persons insist on an age-grade lock step for our educational system.

At the Study of Mathematically Precocious Youth (SMPY) of The Johns Hopkins University we have observed that educational acceleration of able

youths who are *eager* to move ahead fast seems to enhance their academic ability, motivation, career aspirations, social awareness, self-concept, and creative potential. For example, a young man whom I shall call Alex was graduated from The Johns Hopkins University in May of 1977 at the age of 17¾ years. He is one of five young men in SMPY's program graduated from Hopkins during the 1976–77 school year who ranged in age from 17 to 19. If Alex had remained in the sequential lock step, he would have just graduated from high school in June of 1977. Before attending Johns Hopkins Alex skipped three grades, took seven college courses, and earned the top grade (five) on the difficult BC level Advanced Placement Program calculus examination. He was one of five SMPY participants at Johns Hopkins or elsewhere graduating during the 1976–77 school year who earned a three-year National Science Foundation (NSF) Predoctoral Scholarship with which to do graduate study. While still an undergraduate he solved a difficult computer problem that had remained unsolved even among experts for a number of years.

Another individual, Tom, also is an NSF winner who graduated from Johns Hopkins in May of 1977. At age 18 Tom received his B.A. in theoretical physics with high honors (GPA = 3.93). In March of the same year he presented a professional paper on "quarks" at an invitational inter-American conference on theoretical physics in Texas. Both Alex and Tom were elected to Phi Beta Kappa. Would either of them have found equally challenging and stimulating educational opportunities had they remained in high school? That seems overwhelmingly improbable.

Among the many forms of accelerative facilitation for intellectually gifted youths, subject-matter acceleration is especially appropriate in the area of mathematics (George and Denham 1976, Stanley 1976b, Fox 1974, 1976) and probably for the physical sciences as well (Cohn in press, Cohn and George 1977). Because of the sequential nature of mathematics it is easy for students highly talented in math to telescope the learning time for the precalculus sequence into one or two years, while preventing boredom from occurring. We at SMPY have demonstrated that fast-paced mathematics classes are an effective and stimulating way for individuals to learn mathematics. All of the twenty-eight students who attended the second fast-math class from September 1973 to June 1974 completed at least calculus by the end of their senior year in high school. For many of them this would not have been feasible without our program. Sells (in press) has shown that mathematics acts as a filter to self-select individuals, especially girls, out of professional careers. At least thirteen students in the above mentioned class had completed the math sequence through calculus III and differential equations at the college level before they were 18. Seven presently are attending major universities such as MIT, Princeton, and Johns Hopkins. In the fall of 1977 another two entered college two years early. Individuals choosing not to major in mathematics or the mathematical sciences still retain a solid background with which to pursue other fields of interest such as electrical engineering, the natural sciences, and even economics.

The type of acceleration will vary according to the needs of the student, his or her desire to move ahead, and the school situation. Acceleration is an alternative that we at SMPY believe many students would select if given the opportunity. By slowing down the natural learning rates of highly able reasoners one extinguishes academic motivation and adjustment in precisely those curricular areas where individual ability and interest are strong. Appropriate enrichment as defined by Stanley (1976a) eventually should lead to academic acceleration at some later stage in secondary school. Lehman (1953) points out the importance of early professional work and its positive relationship to creative potential.

Would you insist that a student who can get a perfect score on the Cooperative Mathematics Test—Algebra I before studying the subject still should take 180 fifty-minute periods of formal algebra I instruction? Some school systems do. Sixty-five percent of 278 seventh or underage eighth graders from SMPY's talent search who took a standardized algebra I test scored at least as high as 39 percent of the eighth graders in a national sample did *after* having completed a school year of algebra I. Our group, however, was fifteen months younger and had studied no algebra per se. Thirty-six of that group scored in the upper 5 percent of the national norm group.

As demonstrated by programs in states such as Illinois, Maryland, Minnesota, Nebraska, and Pennsylvania, administrative flexibility and acceleration should be important components of any school's program. In conclusion, acceleration and appropriate enrichment when blended together permit an eager, well-qualified student to proceed at a stimulating pace and at an appropriately high level of abstraction through a curriculum that he or she might not otherwise ever pursue well.

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STANLEY: The first book that came out of the Study of Mathematically Precocious Youth was entitled *Mathematical Talent* and subtitled *Discovery, Description, and Development*. The editors of that volume were Julian C. Stanley, Daniel P. Keating, and Lynn H. Fox. Both Dan and Lynn earned their doctorates under my direction while helping get SMPY started several years ago. Since 1974 both have been working on their own projects, Lynn at Johns Hopkins and Dan at the University of Minnesota. Our next speaker is Dr. Fox, a specialist particularly in the area of sex differences as related to mathematical aptitude and achievement. She also is the founder and project coordinator of the Intellectually Gifted Child Study Group in the Evening College and Summer Session of The Johns Hopkins University. Dr. Fox:

SEXISM, DEMOCRACY, AND THE ACCELERATION VERSUS ENRICHMENT CONTROVERSY

Lynn H. Fox

If we define *enrichment* as the provision for learning experiences that develop higher processes of thinking and creativity in a subject area and define *acceleration* as the adjustment of learning time to meet the individual capabilities of the students, they are complementary rather than conflicting goals. If we assume that the major goal of educational programs for the gifted is to meet their learning needs, both enrichment and acceleration are necessary. Thus, the gifted learner can proceed at a faster pace, to a higher level of content and more abstract and evaluative thinking than his or her age peers.

At the risk of overgeneralizing, we can conclude that the controversy over enrichment versus acceleration is partly a function of the specific curriculum for a given content area. By and large, the acceleration of learning in science and mathematics leads to higher levels of abstraction, more creative thinking, and more difficult content. In social studies and language arts the hierarchy of curriculum is less clear (Fox 1979).

Another dimension of the acceleration versus enrichment argument involves the administrative level for instruction. Teaching a gifted student concepts of computer science, algebra, logic, a foreign language, and so forth as a supplement to in-grade work at the elementary, middle school, or junior high school level, without any high school or college credit, is likely to be called enrichment. If the same student studied the same content in a course at the high school or

college level for credit, it would be called acceleration. Acceleration typically leads to either early graduation from high school or entrance to college with advanced standing or earned credit, whereas enrichment implies that the student is exposed to the higher-level material without receiving formal credit. Thus, the student may be forced to repeat the material at a later time.

Although few schools or school systems provide for or encourage accelerative experiences in mathematics and science, acceleration of learning by very able youngsters does occur within and outside school settings (Fox 1974a, 1976a). SMPY repeatedly has found students at grade seven who already know most of the content of a first-year algebra course before they have taken it in school (Fox 1974b). This natural acceleration is due to great mathematical reasoning ability and independent study at home in systematic or unsystematic ways. Unfortunately, students who have a deep interest and curiosity that leads to such accelerated learning are penalized by the rigidity of schools that fail to provide diagnostic-prescriptive teaching strategies. Thus, well-motivated students typically are forced to waste hours of their time "learning" something they already know.

A few students rebel successfully against the system and are allowed to move ahead in their studies at school. A few students find they can double up on science and mathematics courses in high school or take courses in the summer and, eventually, speed their progress. Such students are likely to be male and from homes where education is valued but parents are willing and able to trust their own judgments over those of the school authorities. Thus, failure to provide systematic accelerative experiences in school for talented youths probably contributes to sex differences in later achievement (Fox 1976c). In one study, 48 percent of a group of mathematically gifted boys managed to accelerate their math progress in school by at least half a year, whereas only 16 percent of a comparable group of girls accelerated their progress (Fox 1976b). A group of girls who participated in a program to encourage acceleration after grade seven were, by the tenth grade, as accelerated as the boys and significantly more accelerated than the other female group (Fox 1977). It seems likely that some disadvantaged gifted males also are held back by the system. Failure to provide accelerated experiences within school settings may actually be sexist and undemocratic.

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STANLEY: Thank you, Dr. Fox. The next speaker is Dr. Daniel P. Keating, who is the editor of a book that came out in 1976 from The Johns Hopkins University Press called *Intellectual talent: Research and development*. It was the second volume in SMPY's *Studies of Intellectual Precocity* series. Dr. Keating:

THE ACCELERATION/ENRICHMENT DEBATE: BASIC ISSUES

Daniel P. Keating

It is remarkably easy to become lost in a discussion of the relative merits and demerits of educational adjustments that are termed *accelerative*, and others that are termed *enriching*. What we risk losing are two important things: a useful perspective of the overall goals for the education of highly able students, and a sense of what it is possible to achieve in the real world of the schools as they exist in the present. Since other symposiasts undoubtedly will address many of the important issues involved in the acceleration/enrichment controversy, I would like to make some simple (but I hope important) observations from the perspectives noted above.

If we step back for a moment and ask ourselves what is the single most compelling difference between gifted or high-ability students and more average students, it is quite obvious that it is the rate at which they are able to acquire and integrate new information, especially if the information is meaningful: high-ability students learn faster. Evidence for this comes from long years of classroom experience with such students, from laboratory classroom studies that have been carefully controlled and conducted (Keating 1976; Stanley, Keating, and Fox 1974), and from experimental laboratory studies that indicate moderate

rate advantages even for very basic information-processing parameters (Keating and Bobbitt 1978). A major goal for all students should be to expose them on a fairly regular basis to novel, challenging, and educationally relevant material. If this is to be accomplished for high-ability students, a higher density of subject matter per time unit will be required. Any educational facilitation that can provide for high-ability students is appropriate, and whether we choose to label this "acceleration" or "enrichment" is an administrative rather than an educational decision.

This brings us directly to the second constraint, which is that such adjustments do need to be made within the confines of the school, if we are to have practical and continuing programs in the foreseeable future. The implication is that such administrative matters are far from trivial. In counseling with high-ability students, a great deal of time must be spent on just such arrangements. The most feasible adjustment for the vast majority of students is to move them ahead directly so that they have a reasonable chance of seeing material that meets the criteria of being novel, challenging, and educationally relevant.

Thus, for the vast majority of students, acceleration in the administrative as well as the educational sense will be the best option. We should not, however, cease efforts in other kinds of educational reforms that also will benefit their learning process. But such efforts should not divert us from doing meaningful things for current students. In particular, we often hear of the solution for such students being found in curriculum reform. Although such reform might be desirable, there should be differences in the rate of exposure to any curriculum, because individual differences among and within students surely will remain.

Much of the acceleration/enrichment debate concentrates on a separable issue, however—the possible *harmful* effects of moving ahead. These criticisms are reasonably arranged in two categories: possible negative effects on other areas of development, such as social or affective; and possible negative implications for mathematics or science learning per se, the usual concerns being gaps in skills or superficiality. As for the social-emotional concerns, it seems time to abandon them unless and until some solid reliable evidence is forthcoming that indicates real dangers in well-run programs. The evidence to date is that, try as we might, we cannot detect such harm, although much research has been conducted along these lines (see chapter 2). One may question the accuracy of the research, of course (e.g., how to measure affective or social development effectively), but without some solid evidence of problems in this area, it seems unwise to abandon helpful measures because there *may* be problems elsewhere. A cost-benefit ratio works heavily in favor of active intervention on this issue, while orthodoxy alone argues against intervention.

A similar situation exists for the second concern, mathematics or science learning per se. Gaps in skills need to be demonstrated rather than asserted, and to my knowledge no convincing negative evidence exists here either. It certainly does not show up in the performance of the SMPY students (Keating 1976, Stanley, Keating, and Fox 1974).

The issue of superficiality is more difficult to dispel, principally because it is harder to define operationally. This argument *can* be an infinite regress, that is, one can meet each specific criticism with a demonstration, only to have it supplanted by another criticism demanding additional demonstration.

Criticism: These students are learning only specific rules for a given subject which they do not understand, and thus will lack ability to learn subsequent material.

Demonstration: They continue to do very well in subsequent courses, even difficult ones.

Criticism: They are learning only techniques, but do not have a good overall conceptualization of the subject matter.

Demonstration: Even in advanced, college-level theoretical courses, they outperform many bright but nonaccelerated students. And so on.

Eventually one can place the bar on the hurdle so high that no one can jump it, and we gain little knowledge from having done so. One specific criticism, for example, is that budding mathematicians may be deflected from following pure mathematics because of an accelerated program. This is a valid potential research topic, but one that will be difficult to pursue because of the very low base-rate of pure mathematicians in the population (e.g., less than 500 new Ph.D. recipients in pure mathematics each year), a point often overlooked. Longitudinal follow-up studies by SMPY eventually may address this question, however.

Let me conclude by observing that well-run programs to facilitate academic talent through accelerative adjustments have substantial benefits but relatively few demonstrable costs. Like any educational technique, however, acceleration is subject to abuse. Important components of well-run programs include selection appropriate to the particular facilitation under consideration, excellent and continuing counseling, and enthusiastic, competent teachers. A discussion of these components is beyond the scope of this paper, but if they are present, there is good evidence to support the contention that such facilitation will be beneficial to students currently. We should continue to seek the *best* route for educating such students, but accelerative adjustments are the closest contemporary approximation.

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STANLEY: Thank you, Dr. Keating. Our next speaker is a recent past-

president of the National Council of Teachers of Mathematics and a professor of mathematics education at the University of Texas. I have known her for a number of years, ever since she was a graduate student in mathematics education at the University of Wisconsin. Dr. E. Glenadine Gibb:

EDUCATIONAL ACCELERATION OF INTELLECTUALLY TALENTED YOUTHS: THE *MATHEMATICAL* AND PHYSICAL SCIENCES

E. Glenadine Gibb

Should the talented in mathematics be provided with programs of enrichment or should these students have the opportunity to choose among the several modes of acceleration commonly defined as skipping grades, fast-paced mathematics courses, enrollment in college courses, early admission to college, advanced placement in a mathematics program, and the like?

I support a program of enrichment with depth and horizontal development followed by acceleration as deemed desirable. My rationale for this position includes some specifications: the nature of the enrichment, the needs for effectiveness in mathematics, and the shortcomings of acceleration supported by research that otherwise might purport to support acceleration as the optimal management system for the education of these talented youths.

Divergent production is a necessary ability for success in mathematics. Creativity is also a commonly identified trait of students in programs for the mathematically gifted. Such programs place greater emphasis on advanced conceptualization not easily grasped by those similar in age but of lesser ability; on the development of higher-level cognitive processes; on opportunities for divergent production; and on fostering creativity, including questioning, experimentation, devising new approaches, and testing results. At the same time, such programs should not become sterile, pedantic, and too intellectual. They should be designed for appropriateness of the maturity and interests of the learner, whether at the elementary, secondary, or collegiate level.

Programs that the gifted can be expected to encounter, if accelerated, are designed for the mainstream student at that level. Although evidence from research supports the success of talented students in such courses, one must be reminded that for the most part these evaluations reflect a student's ability to perform on traditional, convergent-production tasks. These evaluations can be expected to neglect an important component of giftedness, that of divergent-production tasks. Reducing the student's learning of mathematics to mere logic is an effective way to stifle creative mathematical thought. A student whose creativity is stifled may not continue in mathematics long enough to learn to enjoy it and to contribute his or her talents to the field. Furthermore, students who have experienced programs of acceleration have been found to have superficial mathematical understandings and insights and to have gaps in their programs of

study.[19] They also have been denied the opportunity to develop their innate abilities of divergent thinking and creativity, abilities that are characteristic of talented people and particularly of mathematicians and scientists. Indeed, they have had the opportunity to study "average" material sooner, only to have an "average" education.[20]

If, however, programs of enrichment merely produce "more of the same," and are irrelevant to the student's development of higher intellectual processes, then support of acceleration in the average, mainstream program becomes a more likely alternative compared to that which can be expected to bore the student and reduce his or her intellectual activity from brilliance to mediocrity.

May we not debate the issue of enrichment versus acceleration? Special content properly organized and presented can be achieved in any number of environments and management systems. The more difficult problems of research and development lie in quality curriculum enrichment—enrichment that provides the needed depth and stimulation for the intellectual ability of gifted mathematics students at their levels of maturation and interest.

STANLEY: Thank you, Dr. Gibb, for those heuristic suggestions. I might say that in SMPY's experience, the holes in the background theory doesn't hold up empirically at all. The youngsters who move fast do learn the material and show up, for instance on the Graduate Record Examination's advanced exam in the field of mathematics, making virtually perfect scores as early as age 14.

Dr. Anne Anastasi, the final speaker on this panel, is the long-term leader in the field of psychology of individual differences in the United States. The author of two distinguished textbooks in that area, she is a recent past president of the American Psychological Association. Dr. Anastasi:

SOME REFLECTIONS ON THE ACCELERATION-ENRICHMENT CONTROVERSY

Anne Anastasi

Let me begin by underscoring a point made by several speakers: acceleration and enrichment are neither unitary nor mutually exclusive approaches to the education of gifted children. There are many variants of each and many combinations of the two. Several examples can be found in the Study of Mathematically Precocious Youth, conducted by Julian Stanley and his associates,

[19]EDITORS' NOTE: After an extensive review of the literature, Daurio found no such evidence.

[20]EDITORS' NOTE: Certainly, those students who were graduated from The Johns Hopkins University or elsewhere five and one-half to seven years early did not have an "average" educational experience. Surely, for example, the depth and rigor of a good college course in mathematics will surpass most of what is called secondary school mathematics enrichment.

as well as in Elizabeth Kearney's description of the California programs, to cite only two illustrations. The optimal variant or combination depends not only on the intellectual, emotional, and physical variables of the individual child but also on the child's own interests, wishes, and initial response to the program. I trust that no one would recommend continuing a program of acceleration, enrichment, or both if it clearly makes the child unhappy. I would urge not moderation but rather individualization.

Acceleration never ought to mean "pushing." It should mean "stop pulling back." In the same spirit, enrichment activities should fit the child's interests and utilize his or her strengths. From the standpoint of mental health, the individual should be given opportunities to pursue activities that interest him or her and in which he (she) can succeed. But notice that the more closely the content of enrichment matches individual interests and talents, the closer it approaches acceleration. If a child already is mathematically talented, enriching his or her program with more math places that child even farther ahead of age and grade peers in this area.

Suppose, on the other hand, that the content of enrichment is chosen with the opposite goal in mind—that of broadening the scope of the child's activities. In this connection it is noteworthy that large-scale surveys consistently have shown gifted children as a group to have characteristically broad interests. In some cases they even run the risk of diffusing their energies too widely and hence need help in focusing and channeling their activities. Some advocates of enrichment, however, seem to imply that we should seek out an area in which the child shows little interest and talent, and "enrich" the child's life by providing more in that area. This is a form of lateral enrichment based on the spinach theory. You give it to the child because it's supposed to be good for him (her). I don't think I need to spell out what such an approach is likely to do both to the child's liking for the area and to his or her mental health.

In order to cope with the continuing knowledge explosion in all fields, we need specialization and an early focusing of educational efforts. The person who sets out to be a Renaissance man today is likely to end up as a dilettante. Formal education, based on what is known at the time, should be completed as early as possible. Otherwise, much will have to be unlearned after graduation. The rapid accumulation of knowledge makes lifelong education essential for leadership in any intellectual field. The process of growing to maturity in today's world includes a succession of choices between what we can and what we cannot afford to master—between what can and what cannot be fit into one lifetime.

STANLEY: Thank you, Dr. Anastasi, for those perceptive remarks. We are fortunate to have as one of our symposiasts Dr. Joan S. Stark, who is the director of the program in higher education at Syracuse University.[21] I knew her a few

[21]EDITORS' NOTE: In the fall of 1978 Dr. Stark became Dean of the School of Education at the University of Michigan.

years ago as an assistant dean at Goucher College and from October of 1971 through her son, Eugene. Dr. Stark has had a distinguished career in her own right. As a student at Syracuse University she majored in the science area and was elected to Phi Beta Kappa in her junior year. Her son, Eugene, who was graduated from Johns Hopkins as an electrical engineering major at age 17, won a National Science Foundation Fellowship to work toward the doctorate at MIT. He has done remarkable research work at both General Electric and Bell Telephone Laboratories during the summertime. I will yield the floor to Dr. Stark to tell you whatever she wants to share about either her general views of giftedness or her special views about her role as the mother of an extremely accelerated physical scientist. Dr. Stark:

REMARKS ABOUT PRECOCITY AND COLLEGE COURSES

Joan S. Stark

This paper is written from my dual vantage point as (1) a college administrator and educational researcher who has done some minor studies of educational acceleration in the distant past, and (2) the mother of a radically accelerated student. I intend to suggest two areas of investigation that seem not to have been pursued in Professor Stanley's SMPY program but that I believe are important in learning to facilitate the progress of gifted youths who enter college at a young age. Not surprisingly, the matters that I believe merit investigation relate to my concerns about the education of students who pursue college studies at the typical age as well.

My first proposal is that an apprenticeship program as a method of meeting initial acceleration needs of brilliant youth might be superior to the pursuit of a random selection of college courses on a part- or full-time basis. This hypothesis is based on assumptions that some college teachers are better suited than others to deal with intellectually talented students and that these teachers can be identified by their attitudes toward students and toward the educational process.

The efforts of SMPY are based largely on the assumption that early college work is better for brilliant youths and the project has demonstrated that selected students can progress well at a young age. College work is presumed better because it is more stimulating intellectually than that which normally can be pursued in junior high or high school. Additionally, there is evidence that some high school teachers are not receptive to the needs of talented youth or, on the basis of negative stereotypes, they may even be antagonistic or threatened. Research done by the SMPY investigators indicates, too, that the success of junior high youths in accelerated mathematics classes is greatly facilitated by carefully selected, dynamic instructors who teach at a fast pace but value individuality and have a genuine respect for students.

It seems incongruous to report that teacher style is important in an experimental situation and at the same time to assume that college work will provide

stimulation merely because the subject matter is advanced, while neither measuring nor taking into account the characteristics of college teachers expected to provide the stimulation. My recent research on educational attitudes of college faculty members and my personal observations indicate that if college work stimulates the radical accelerant, it may do so *in spite of* the college teachers.

Students who take courses at a large university likely will be taught, initially, by poorly compensated graduate assistants with minimal experience and little incentive to dedicate themselves to the teaching task. Further, out-of-class faculty-student interaction is likely to be infrequent at a large university, at least in the lower division program. Lastly, individual learning activities customarily are not optimal in colleges; with a few exceptions for personalized instruction experiments, the lecture method prevails.

Under such conditions one might look to the small college that prides itself on the teaching role and on individual attention to students. Yet, in a current study of 287 faculty members in six liberal arts colleges, I have found that 76 percent believe that unless motivated by grades students will not study, 63 percent feel that students do not learn well when studying on their own, 60 percent do not expect students to dig deeply into topics in which they are interested, and 52 percent do not believe that students should pursue their own interests. These and similar attitudes common even among professed teaching faculty seem antithetical to the kind of teaching brilliant students might expect to receive in college courses. I would conjecture that many of the successful radically accelerated students who are at college full time have sought and found relationships with particular professors who have the characteristics necessary to keep lit the spark of learning and, further, that such students merely tolerate the other classroom professors who perform their roles lackadaisically. Developing such a relationship is more difficult if a student begins acceleration on a part-time, commuting basis. If appropriate professors can be identified, as I believe they can, one might assign intellectually talented students to work with such teachers as apprentices to give such students a meaningful anchor point in the university apart from just enrolling in a course or two.

My second proposal is related to the first. In general, our society does a poor job of preparing adolescents and young adults for the transition from school to work. This transition is a particularly crucial one for youths who finish college at the age of 16 or 17. We should not only study the difficulties that current accelerants might encounter but also seek opportunities to ease the transition in order to promote appropriate career choices. Our labor laws, originally designed to protect youth, now allow a mathematically precocious 15-year-old to lift heavy grocery bags in subzero temperatures but not to program a computer or plan an electronic circuit in an industrial setting where he or she might explore potential scientific careers. Staff members of SMPY have reported that the radical accelerants with whom they work have a meaningful self-image and are interpersonally effective, socially mature, and well-equipped to meet challenges.

One challenge that needs to be confronted is the opportunity to use one's skills in a setting other than the classroom. For example, the contrast between the collegiate investigative world and the work-a-day world where employees pace themselves to complete a minimum of tasks is a difficult one. But awareness of this contrast is a maturation experience that should not be neglected. Efforts to facilitate appropriate employment and the study of accelerants in such settings seem as important as facilitating year-round study, which may provide too little variation for the self-motivated accelerant. An important next step in investigating the progress of intellectually talented youngsters who pursue accelerated study would be the provision of planned work experiences and longitudinal case studies of adaptation.

STANLEY: All of the five seniors in our SMPY program at Hopkins have somehow managed to get high-level, meaningful work experience. They find it difficult to get paid even minimum wages for such work, as Dr. Stark pointed out. But by one way or another all of them have managed to do so during their undergraduate years. Gene Stark's problem was that he finished the sophomore year at Johns Hopkins while he was still 15. He did not become 16 until July 10, and yet he was ready to get into some research. He had to wait until his sixteenth birthday before he could go to work for a national organization. The next summer he had even more trouble. He was employed at age 16, but they had, as I understand it, to acquire him like a sack of flour on a purchase order, because they couldn't actually pay him as an employee at the age of 16 even though he had finished his junior year at college with a distinguished record.

The final viewpoint will be given by SMPY's greatest long-term advocate and friend, who has come to every paper presentation and meeting we have had for many years. I have known Al Kurtz for a long time. He has a distinguished background as one of the early specialists in measurement. He has been known to me ever since the beginning of my own graduate days, back in 1945, and we have been very pleased to have him so interested in our project. It's quite fitting that he be the final speaker. Dr. Kurtz:

ACCELERATION VERSUS ENRICHMENT —THE TENTH RULE OF THREE-CUBED

Albert K. Kurtz

I shall quickly do what Dr. Stanley asked me to do—state my positions on acceleration and on enrichment. That's easy.

First, I'm for acceleration. Why? So that the greatest minds in our country can develop their talents to whatever extent they wish. I hope the teachers in our public schools will encourage these gifted children, enabling them to complete the twelve grades in what is for them the proper length of time. But at least, let us

no longer allow the teachers to deter bright children from attaining what are for them simply normal and eminently reasonable objectives. What are these objectives? I'll give you an example. Let's say a boy with an IQ of 120 lives next door to a group of children all having IQs of 100. When he is 5 years old with a mental age of 6, his knowledge is equal to that of the 6-year-old. Every time a year goes by, he learns 20 percent more than the child next door. When he reaches 10 he has a mental age of 12. This process will continue until he reaches 15 (we have a little problem here over which Terman and Wechsler disagreed, concerning when mental ages reach their peaks). Until that time he will have continued to learn about 20 percent more each year and will have accumulated about 20 percent more knowledge than the 15-year-olds next door, whether or not he then has a mental age of *exactly* 18 years.

The Tenth Rule of Three-Cubed

The average child (and far too many bright ones) graduates from high school at age 18. We just saw that a child with an IQ of 120 could set graduation at age 15 as an eminently reasonable objective; he'd know as much as the average 18-year-old. But what about other bright students? The tenth rule of three-cubed gives the answer. It works this way. Take one-tenth of the IQ, subtract it from three-cubed, and get the eminently reasonable graduation age. Thus, when we subtract one-tenth of 120, or 12, from three-cubed, or 27, we get 15, just as we did before. This simple rule works for nearly all bright kids. For all IQs from 115 to 157 we either get the theoretically exact value or miss it by no more than a month or two.

Thus, as any of Dr. Stanley's mathematically talented youths long since have figured out, I feel that students with IQs of 120, 130, 140, or 150 should have no trouble in graduating from high school at ages 15, 14, 13, or 12, respectively. Yes, that says that Terman's gifted children could well have been graduated at 13 years, as some of them did. Many others could have and should have.

Now let us turn very briefly to my position on enrichment. I'm thoroughly fed up with this emphasis on agemates. I have a one-word comment on enrichment, the same one General McAuliffe gave thirty-three years ago: Nuts!

STANLEY: Thank you very much, Dr. Kurtz for your summation. There will be time for comments about your point of view from the audience. Feel free to ask questions of any person on the panel.

CONNIE STEELE:[22] I'm delighted that everyone is concerned about those children who are accelerated into college and I can understand the concerns of the

[22] Audience questioner: Connie Steele, Texas Institute of Technology, Lubbock, Texas 79408.

Johns Hopkins University group. If we, however, are going to respond to the potential that might be possible for our children, as Ellis Page alluded to, in order to solve our problems, how can we identify them at very young ages? Shouldn't this early identification begin systematically from birth, rather than just by proud papas and proud mamas who say "'Gee, my child is doing these great things?''

NANCY JACKSON: I would like very much to take on that question. We are working on the problem of how to identify children with advanced intellectual abilities before they reach age 5, the usual age of public school entrance. We have been working first in a small-scale, pilot way within a large-scale, longitudinal study. We are beginning to see what I think are going to be some very important trends. We have not been successful in doing any large-scale identification of precocious children before the age of 2. When we look back retrospectively at children who later show signs of extreme precocity, we can see many remarkable things that they did during infancy, but when we have tried to solicit from parents in the community a large group of children who are less than 2 years of age, we have discovered that almost every infant looks extraordinary to his or her parents. Beginning at about age 2, however, such children appear to be more successfully identified. This also is the age at which a standardized assessment first is possible. By this age we can get extensive reports from parents by means of lengthy questionnaires about various aspects of a child's intellectual development, including what things a child is interested in, when the child first started to do various things, and so forth. What we seem to be finding is that at age 2, or perhaps 3, information from parents, proud though they are, actually is at least as good and possibly in the long run a better predictor of what the child will be like several years later than is a test score alone. Standardized tests take such a small sample of a child's behavior. If a child does very well, then we know something, but if the child is noncommunicative or highly active during the test session and simply not interested in our games, we don't know whether it is a case of can't or won't. What we have been doing is taking information from parents of the children with whom we deal. Rather than have the parents answer directly the question "Is your child extraordinary?'' we have raters read through the questionnaires and make judgments about the child in a variety of intellectual dimensions on a three-point scale. These points include whether the child seems to be developing at an average rate, an advanced rate, or an extraordinarily advanced rate. To date our findings are that these judgments can be made reliably by two independent readers and that they contribute significantly to the long-term predictions of the child's accomplishments.

STEELE: Is your material available?

JACKSON: Yes, and if you would write to us I would be glad to send it to you.[23]

KEARNEY: One of the things that kept coming up in the various discussions

[23]EDITORS' NOTE: Professor Halbert Robinson conducts the Child Development Research Group at the University of Washington in Seattle, Washington 98195. Dr. Jackson is on the staff of that study.

concerned the possibility that some negative emotional developments might occur if we fail to identify these children and provide for them. The only study that I recall, is one that was done as a doctoral thesis by Dr. Richmond Barbour, who was the assistant superintendent of the San Diego schools. He did a twelve-year longitudinal study in which he took three groups: one group just went through school; one group was isolated from peers; and the other group was matched for a portion of the day according to members' particular levels of precocity. The study concerned both achievement and emotional development. Dr. Barbour found out that by doing nothing for them (group 1) you actually *cause* major emotional problems. So great was this study's impact, that administrators set up a clinic for emotionally disturbed gifted children in San Diego and found that the children without special provisions tended to end up with some type of need for counseling prior to the end of the twelfth grade, if they got that far. The other students seemed to do well, especially those in the group that was totally isolated. Those in the other group did almost as well, but those in the control group seemed to have developed serious emotional problems.

KEATING: I want to go back to a brief comment about what Nancy Jackson mentioned a moment ago in terms of early identification. As Nancy and the other people on her project well know, one of the problems has been the difficulty of using infant intelligence-type measures and the notorious unpredictability of such measures among anyone under 4 or 5 years old. There is a book by Michael Lewis that addresses this issue and tells why that might not be the case.[24] If we are going to be successful at all in terms of prediction for long-term development, we need to look for functional equivalences. I think this is the kind of research that is being conducted at the University of Washington.

EHRLICH: We have in New York City a program that we have been directing for children who are 4 at the beginning of the year when they are admitted to kindergarten. This means that frequently we test them at the age of 3½. We have had considerable success using in part identification by parents. Parents do a very good job of recognizing the giftedness of their very young children. Of course, we follow through by a psychological testing and an interview. We do use the Stanford-Binet. Three-and-one-half years later we have found that the youngsters we located originally were identified correctly. I think we had only one child in all of that time who we felt should not have been included in our program. I would like to add the point that we are doing an intervention study in conjunction with Teacher's College of Columbia University under Dr. Harry Passow. The study compares the youngsters whom we selected with a control group of youngsters who applied to the program but for various reasons could not be accepted (mostly because we did not have space). Perhaps soon we will have some answers to the question of what happens when there is, or is not, intervention of the type we advocate at an early age.

[24]For those persons interested in reading Michael Lewis's book, the citation is as follows: 1976. *Origins of intelligence*. New York: Plenum Press.

STANLEY: Dr. Stark wants to make a comment. I recall that her son, Gene, was tested on a Binet-type instrument quite early, and scored quite high, so she probably has observations about her experiences with an extremely bright youngster from preschool years. Dr. Stark:

STARK: I was going to try not to be as anecdotal as that. The instance occurred when Gene was 4 years and 5 months old. When the school informed me, I went to find out what I should do. Should I send him to kindergarten because he was reading at, I think, around the sixth or seventh grade level? He read the *New York Times* regularly at that point. I was told, however, that he should be put into the normal program, and by fourth grade he would be like everyone else. I think that probably would have been the case except that he skipped the second grade due to a very diligent teacher who saw the matter in a different light than did the kindergarten teacher. I could give you a whole bunch of anecdotes about kindergarten, but what I wanted to suggest is that I think there is a very simple way of identifying these children at about the second grade level, maybe even the first grade level. Preferably it should be done early, and certainly it should be done because what these children discover very quickly (because they do use some logical reasoning) is that it is better to hide their light under a bushel basket. They will quickly find out that their peers do not have the same interests that they do, and therefore they will sneak away into back rooms to read what they want to read, or play the piano, or do whatever they want to do. I would hypothesize that at about the second grade level one could, after establishing some trust and confidence with the child, ask him or her two questions: "What is it you like to do the most when you are alone?" and "Why don't you do that in school?" And you can easily find that the child has discovered that it is not wise to be smart.

STEVE CHRISTOPHERSON:[25] I have a question for Ellis Page. I'm curious about justifications for separate programs for the gifted in the public schools. The practice of separate programs seems to imply a belief that there are two bodies of knowledge to teach, one for the gifted, one for the others. I am confident that ultimately there is only one body of knowledge to draw from in each of the subject areas, but is there evidence that the nature of the intellectual development of gifted children is different or simply more precocious?

PAGE: This is a very big question. You spoke of separate programs not being appropriate, and (if I understand you correctly) you are saying that the gifted 10-year-old who has an IQ of 150 is like the average 15-year-old. Is that what you are saying?

CHRISTOPHERSON: That is what I'm curious about.

PAGE: The point that I was making is that, as well as having this common *g*, there are differences that separate that 10-year-old from the 15-year-old. That is the implicit justification for those who defend enrichment over acceleration.

[25]Audience questioner: Steven L. Christopherson, Department of Education, Trinity College, Hartford, Connecticut 06106.

CHRISTOPHERSON: So you think that the nature of the development is different but that their minds don't follow different rules. Their age differences or backgrounds and experiential differences might justify separate programs.

PAGE: My own opinion agrees with what you seem to be implying, that cognitively the gifted 10-year-old is not very different from the average 15-year-old. This is one of the very central issues in the whole discussion.

JAMES: I would like to comment on this question. One of the papers delivered here suggested that the child at a given age who is gifted will have acquired everything that any other child at that age is likely to have acquired and more, since the potential for learning 20 percent more each year carries that child on at a faster rate. It is not a question of learning different bodies of knowledge; rather, it is a question of the gifted child's learning it faster, at an earlier age, and continuing to learn more as he or she grows older.

GOLD: I'd like to make two points. The first is one that James J. Gallagher has addressed, the issue concerning the qualitative versus the quantitative differential. Suppose it is really a quantitative differential, point by point and characteristic by characteristic, but would not the interaction in the summation indeed lead to a qualitatively different individual? The second point is that it seems most of us today have been talking in terms of curricula and programs that have been. We haven't addressed a very important issue, programs that could be. Now if education is just the acquiring of bits and pieces of knowledge, if we go no higher than 2.00 in Benjamin S. Bloom's *Taxonomy of Educational Objectives,* then maybe indeed acceleration is the answer and we have the 10-year-old sitting with 15-year-olds. But as we said, we are dealing with a different kind of individual with a different potential undoubtedly. Perhaps we could start moving this type of youngster into the 3.00 through the 6.00 levels and go beyond what we have been doing for the last couple of thousand years.

KEATING: The second part of the question was I think rephrased appropriately by Tom James. The question as to whether the difference is qualitative or quantitative is a very difficult one to answer, because we have to define very clearly what we mean by a "qualitative" and what we mean by a "quantitative" difference. It seems to me that a very careful review of the literature would indicate that it is difficult to come up with criteria that could be put forth noncontroversially as qualitative differences. As I mentioned in my talk, the most compelling evidence is for a quantitative or rate difference. That doesn't necessarily mean, however, that we wouldn't want to improve curricula. If we look at qualitative differences in terms of different patterns of intellectual development, different kinds of reasoning, and so forth, it is relatively difficult to come up with evidence. It is much easier to come up with quantitative kinds of differences. As Ellis Page mentioned, however, this question is still unresolved.

OWENS: There is a political dimension in what we're discussing now, one we have run into directly in Alaska, concerning whether or not there is a difference at all. We have assumed one, and we have established programs that differentiate and treat students differently on the basis of giftedness, however we

define it. I think we have opened the door, in the same way as we have done in special education, to a rash of court cases that will require that we serve students whom we have already identified as being exceptional. Once we have defined a class of students, we are bound morally, legally, and ethically to serve them as individuals in a manner appropriate to them.

GIBB: I am concerned that we *do* have to tackle this issue of quality versus quantity, difficult as that task is. In speaking of mathematics in particular, the mainstream (regardless of where it is, even at the collegiate level) can be so narrow. After shopping through that, it seems like these youngsters have lost a lot of the creativity they could bring to knowledge and leadership.

GEORGE: I would like to respond to both Dr. Gold and Dr. Gibb. One supposed problem or question that keeps coming up when you mention educational acceleration is as follows: "Are there gaps? Are these students missing something if we do not spread out or enrich their education?" I recently asked a couple of SMPY early entrants to comment on this issue. Both have been through fast-math programs. The first person, Mr. Kevin Bartkovich,[26] said the following: "The main flaw that is apparent in these arguments from the start is the assumption that mathematically talented students should become mathematicians. I view the applications of mathematics as the more important aspect. In my development math has been a tool, providing a base on which to build. Some people propose that creativity can be stimulated best by enrichment. I believe from personal experience that acceleration is a better method of enhancing creativity. A gifted student is always looking ahead, hoping to proceed further once a concept is understood. Math always is building on the preceding topic, and a gifted student is curious as to what is the next step. This is the essence of creativity, probing further ahead into the material. This creativity is motivated by acceleration, whereas enrichment can be the method that stifles it. I believe the assertion that programs of acceleration leave gaps in understanding is not valid. If the standards for proceeding in a sequence of courses are stringent enough, a student must have a good knowledge of a subject in order to proceed. Learning something quickly does not necessarily mean superficial knowledge. In fact, some concepts (e.g., limits in calculus) do not become clear until a year or two after the initial presentation. Mathematics always is applying previous knowledge in learning new concepts. It is this building and application, and not enrichment alone, that creates deeper understanding. In fact, I have learned precalculus well enough in an extremely fast-paced class to be able to tutor other talented students." The other young man noted that by being allowed to go through the material rapidly he had a much better chance of learning other subject matter as well. In fact, he felt that his divergent production and creative potential were stimulated by his being challenged with a lot of topics that he learned one after another. From what these students said and hundreds more like them I don't

[26]Kevin G. Bartkovich entered The Johns Hopkins University in the fall of 1976, one year early and with sophomore standing. He presently is an outstanding student in a B.A./M.A. program in electrical engineering and one of SMPY's chief mentors.

think acceleration results in learning that would be considered at the lower end of Bloom's taxonomy.

Not all enrichment programs are bad, however. There are many excellent programs at the elementary school level, as pointed out in Julian Stanley's article in the *Phi Delta Kappan*.[27] Many are individualized and challenge the student's special talents. The danger lies in the transition from elementary to secondary school. One Michigan coordinator for the gifted and talented explained it in the following way. She has a class that was accelerated through algebra I by the end of grade six. She then was told to slow down and enrich them because these students would run out of curriculum. This was devastating to the students' willingness to learn. Thus, appropriate enrichment leads naturally to some form of educational acceleration. The University of Washington group commented earlier in their position paper that we should forget the terms *acceleration* and *enrichment* and consider whether actually we are decelerating the potential of the student. Are we allowing him or her to learn at his/her natural rate in areas that are challenging and interesting? Are we really decelerating the intellectual challenge that the student has? This should be even a bigger concern than enrichment versus acceleration. The two blend together; often, a program of enrichment ends up with some form of acceleration, but deceleration may be the aspect at which we need to look.

STANLEY: One of the most powerful bits of evidence about the effectiveness of fast-math classes, skipping grades, moving ahead quickly in math, and getting into high-level college courses quickly in math and related areas is simply the satisfaction felt by those who do it. Those who are *eager* to accelerate some of their educational experiences and are able to do it are almost invariably thrilled, pleased, and delighted that they have done so. They do not prefer to plod through any kind of enriched curriculum of any feasible sort within the typical school, nor would that program usually be feasible unless it was extremely expensive. It is cost-effective for them to move ahead. We have not had a single youngster who has come to college early who said, "I'm sorry I did it." When we ask them at the end of the first year, "Would you rather have been back in high school this year?" they turn rather pale at the thought of having had to stay in high school. These are the ones who wanted to move ahead, of course, so we must keep in mind that we are talking about extremely able youngsters who are eager to do these things. We are not talking about reluctant kids. We are not even talking about Norbert Wieners or John Stuart Mills who were programmed and pushed unusually strongly by their parents.

A second observation concerns defining ability broadly to include a number of different types of cognitive style assessment techniques. Participants in SMPY, even those who finish college at barely 15 with tremendous records in pure math, are not a species apart. They are not different from other mortals,

[27]For those persons interested in reading Dr. Stanley's article see chapter 11. Also see his 1978 Educational non-acceleration: An international tragedy. *G/C/T* (Gifted, Creative, and Talented Children) 1(3, May-June): 2-5, 53-57, 60-64.

except in the incredible speed and complexity with which they can work. There is an extreme rate difference, a difference in degree but not in kind. On the other hand, we have to keep in mind that this would have to be a multivariate model, because the single-score IQ model is inadequate. The Binet IQ is simply the average of a lot of different abilities, some high, others low. There is not a single simple continuum, but instead the aggregate of different abilities. For instance, it is not at all uncommon to find a youngster who excells on most cognitive tests but is relatively inferior on some one, such as mechanical comprehension. There is a young man at Johns Hopkins, one of SMPY's current twenty-six radical accelerants there, not one of the seniors, who is extremely able except that he can hardly do even the sample items on a mechanical comprehension test. We do not know why he is poor at that, but he took physics and had trouble. He had trouble with chemistry lab and so forth. So he is different from someone whose strongest ability is high mechanical comprehension. We have another youth who scored incredibly high in mechanical comprehension at age 13, the highest score we have ever had. He is a computer hardware specialist today, which is not surprising. There is a cognitive difference.

I don't like the magic theory or the "gee whiz" approach so dear to the hearts of many of the journalists who write about gifted youths in the popular press. "Math whizzes" and "genius" are the typical expressions they like to use. There are some questions about details of cognitive styles that are very important. Even among mathematicians there have been quite different cognitive styles, as those of you who have read Eric Temple Bell's somewhat inappropriately titled *Men of Mathematics* know. Some mathematicians aren't good with geometry, and some aren't good with algebra, but they can still be great mathematicians. There are many modalities that should be studied. Individuals are complex mentally, but we have no reason to suppose some sudden qualitative "jumping off" (that's what I call the pre-Columbus theory—suddenly you come to the end of the world and fall off). You don't suddenly come to a different type of person as far as math ability is concerned. It is just some kind of multivariate set of continua that one must study: cognitive differences between individuals and within them.

NINA LIEBERMAN:[28] I want to relate my comment to what Dr. Stanley said about one of the presenters, Mr. Daurio. He commended him for finding the time to go over the literature. (I do believe my comment refers both to enrichment and acceleration.) I am wondering, based on my own research and the theoretical model with which I am working, whether we give enough time, time to reflect, time to ingest knowledge. We have been talking about acquisition of knowledge, but in my books at least to become familiar with what you know is really basic to creating the new. At that point, as I have found in my own research, combinatorial play comes about. I am wondering as we are looking at the gifted and as we are planning for curricula for the gifted, how much consideration we give for

[28]Audience questioner: Nina Lieberman, Brooklyn College, 21 Lewis Place, Brooklyn, New York 11218.

time to reflect, time to digest, time to be comfortable with the familiar. My concern also relates to the feeling of joy over one's own accomplishments, and it might also serve to contribute to a global concept called mental health.

STANLEY: We are trying to help these mathematically talented youths move ahead quickly to a first-rate graduate degree from a major university, which is what most of them want, at the highest possible level and the earliest feasible time. That gives them the years of early maturity in which to be highly creative and energetic rather than waiting until they are 26 to 30 or more years of age. We are trying to help them get Ph.D.s early—19, 20, 21, 22—as for instance Dr. Anastasi did. I believe she had her Ph.D. at 22, and a great deal of nice creative work came from her shop in the early years when she might otherwise have been hacking away at routine teaching or turning someone else's research crank as a doctoral student. For philosophy or creative writing, the situation *might* be rather appreciably different. SMPY operates in math and related areas, instead. Most of the youngsters with whom we work will not become pure mathematicians. I think we have to emphasize that there are less than 500 Ph.D.s a year in the whole country in pure mathematics, less than 500 out of a population age group of three and a half million people, so actually we are talking little about pure mathematicians. We are talking about computer scientists, mathematical statisticians, physicists, electrical engineers, operations researchers, and so forth.

LIEBERMAN: If I may just respond to this. I spoke also as a developmental psychologist, because I think these things have to be socialized early. My own research was propelled by something that was said about Einstein. He thought that one of the most important things is combinatorial play, and play occurs only in a kind of relaxed setting.

STANLEY: He was so relaxed that he quit the gymnasium at 16 to get away from that boring setting and go on to the university. Then he did have a good deal of time, while a patent examiner third class (a lowly occupation), to conceive of and write about special relativity and to publish three papers that made him famous by age 26.

FOX: One thing to think about in planning programs for the gifted is related to your point—how we schedule their time. One of the things that we did early in the Study of Mathematically Precocious Youth, at the time with some trepidation, was to set up a class that met only once a week for two hours. The student had that whole week in which to work over the material and move ahead. While there was some required homework to be turned in, the students knew that they had to determine whether or not they needed to work more problems in a particular section. While it doesn't work perfectly with all students (and we had to do a little counseling and to encourage them to pace themselves rather than to save up all the home work until the night before the next class), that model seems to be much better for these kinds of students than a daily class where they tend to sit and daydream and get extremely bored. This way they get very excited and turned on in this intense two-hour period, and then at their leisure, when the

mood strikes them during the week, they have time to pull out the mathematics. We see them coming back to class responding to something that the instructor threw out as an "Oh, by the way, why don't you see if you can prove this problem?" They come in excited and compare notes with the other students, because they have spent a lot of time during the week working on it. So I think for the highly gifted a different kind of course scheduling would make better sense, thereby allowing them longer periods of time for intensive concentration on their own.

GOLD: A discussion as to what should be included for gifted kids strikes me as almost a discussion about religions. Your own always is the best and the others are inferior. This approach leaves something to be desired. One study that was not mentioned today would do us all good to recollect; I vaguely remember a lot of it, but the results were most important. That is the work Ruth Martinson did in California back in the late 1950s, comparing the effectiveness of the variety of approaches for gifted students in that state. There were fourteen or eighteen different kinds of programs—ungraded primary, Saturday seminar, enrichment activities, acceleration, etc. She doesn't make the result as blatant as I am making it, but somehow she conveys the message that no matter what you do for the gifted, it is almost as good as anything else you do for the gifted. Each of those kinds of approaches is a whole lot better than doing nothing for the gifted. This is something that we might want to look at when our own biases get in the way of what is better, acceleration, enrichment, segregation, or 105 other kinds of terms that could be employed. If any of you remember "Fiddler on the Roof," Tevye was having a discussion with a couple of men and one man makes a point and he says, "You know something, you are right," and then another man makes a point which is diametrically opposed and Tevye says, "You know something, you are right, too!" The third man says, "If he's right, and he's right, how can they both be right?" and Tevye replies, "I'll tell you something, you're right, too."

KEATING: I just want to make the brief comment, that one particular connotation of the term *acceleration* probably is an undesirable one and not an appropriate one. That combination is one of being harried and rushed, sort of whipping right through all the stuff without time to think about it. Our observations within this particular study (SMPY) would not support that kind of interpretation. Self-selection helps prevent such hurried progress. If a student feels that he or she is just going too fast, he/she always has the option of exiting a program at a variety of different points. I've never had the impression that the kids with whom we work (observing them in a variety of situations and talking with them at some length) felt harried or pressed. Instead they feel that they finally have gotten to do something at a pace normal for them, rather than having to sit through a lot of boring, irrelevant material.

KEARNEY: Something that bothers me about today and about all the other meetings I've attended is that we are here because we are interested in the gifted. Hal Lyon's research report a few years back indicated that 57 percent of the

principals who responded said they had no gifted children in their schools. I think that leads us to an important fact; education at the university level for teachers should require one course, at least, not just in the exceptional child but specifically concerning the gifted child.

FOX: I just want to pull together what Dan Keating, Joan Stark, and Marv Gold said: there are a variety of ways to do things. All may not be equally good, but each may be differentially good for different students. As Joan said, certainly by ages 11 and 12 the students are good at picking out which ways meet their needs, which fit their styles and their time designs. We found in working with these gifted students that after they found out we had written a book, some of them went off, read it, and came back to see us and said, "I want to do it this way." They had all the arguments. Someone else came and said, "I want to do it another way." So I think you are right. There are multiple approaches, and the important thing is to keep all the options open and let the student have a choice as to which options suit him or her at that particular time.

STANLEY: Unfortunately, many school systems have at most one option for the gifted, and that is grossly insufficient. Thank you very much for your long-term patience here. We are delighted to have had a chance to talk with you.

[THIS CONCLUDED THE SYMPOSIUM]

As a final summation of the discussion on enrichment and acceleration, Dr. Dorothy S. Sisk, then Director of the Office of Gifted and Talented in the U.S. Department of Health, Education, and Welfare, was asked to present her viewpoint. The following position paper was solicited after the symposium.

ACCELERATION VERSUS ENRICHMENT: A POSITION PAPER

Dorothy A. Sisk

High ability and potential are served best by an education that is more than rigorous and academic. Indeed, education for our nation's gifted and talented must be more than an accumulation of successive concepts, ideas, and facts. Education for the gifted and talented must deal with activities that nurture and develop individual motivation and that produce wisdom.

For years the standard answer to educational programming for the gifted was enrichment. This was true regardless of the research available. Investigators such as Terman and Oden (1947), Gallagher (1975), and Reynolds, Birch, and Tuseth (1962) clearly stated that early admission was to the advantage of the gifted, and that social and emotional difficulties were not synonymous with acceleration.

With the current emphasis on mainstreaming the exceptional child in the regular classroom and the fear of segregation, coupled with the continuing concerns and anxieties of both parents and teachers regarding acceleration, there is a

real danger that programming for the gifted and talented will become a group-directed enrichment travesty. In these kinds of activity-oriented projects, the material to be learned often is extended in quantity rather than depth, all in the name of enrichment.

The passage of public law 94-142, with its emphasis on individual educational planning (IEP) for the handicapped, has led many educators to reexamine enrichment as an answer to IEP for gifted youngsters. They are finding that enrichment often increases breadth of information, that it emphasizes variety and exploration, but that it lacks experiences that call for precision and intensive work.

In fact, much of the so-called enrichment of many programs for the gifted and talented is being found to exist only on paper. Many of the programs lack comprehensive planning and organization; the "enrichment" exists only in the verbalizations of the teachers and administrators who describe such programs.

Where acceleration and enrichment are concerned, the answer to programming for the gifted and talented clearly is not an either/or proposition. No one can deny that some type of educational readjustment is needed to reduce the extended period of education required for a professional career. Making our best minds and talents mark time until age 29 or older is denying both the individual and our culture the benefit of their gifts and talents.

Part of the problem is lack of understanding on the part of both parents and educators that acceleration and grade-skipping don't mean the same thing. Indeed, rapid promotion can damage gifted students if they skip important sequences in a curriculum. However, equal or even greater damage is done to gifted and talented students who repeat materials and are forced to progress slowly with a group.

Optimum education for the gifted and talented should blend enrichment and acceleration for an emphasis on excellence in education. Perhaps a new word such as "exceleration" needs to be coined. That would afford the gifted and talented both the breadth and exploration of enrichment and the rapid progress and telescoping of work of acceleration.

No two gifted individuals are alike. Their variability arises from their creativity, interest, and capacity for problem-solving. The uniqueness of gifted individuals makes it impossible for educators to develop and prescribe any single curriculum for "the" gifted, but their education can be planned so it will provide for total development, including intellectual, emotional, and character aspects. More and more educators are realizing that there is an inherent relationship between intellectual growth and emotional welfare (Howe and Howe 1975, Glasser 1966).

To program for the gifted, all that is needed is the courage to examine what is appropriate for each gifted student and the willingness to make the administrative arrangements to accomplish it. A rapprochement between acceleration and enrichment very well may be the solution.

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