

Early Entrance to College:
The Johns Hopkins Experience
Study of Mathematically Precocious Youth
(SMPY)

The Johns Hopkins University

ANN R. EISENBERG and WILLIAM C. GEORGE

ONE OF THE CHIEF GOALS of the Study of Mathematically Precocious Youth (SMPY) has been to help highly able youngsters, especially in the area of mathematics and its related fields, to find challenging and worthwhile learning experiences. Through a variety of educational practices, primarily accelerative in nature, SMPY has attempted to meet the needs of each student and to recognize the individual differences of the highly able mathematical reasoner. Students have been encouraged to select opportunities from the various methods of facilitation that have been extensively studied (Keating and Stanley 1972; Fox 1974; Stanley 1973; George and Denham 1976; Stanley 1976). Choices include subject-matter acceleration, fast-paced mathematics classes, grade skipping, Advanced Placement Program examinations, taking college courses for credit while still in secondary school, or entering college early on a full-time basis by either leaving high school at the end of the 10th or 11th grade (or even earlier) without a diploma or by graduating early from high school. SMPY's various facilitative strategies have naturally led to a number of highly able and well-motivated youths entering college as full-time students one or more years earlier than they would have ordinarily done. This article addresses the effects of shortening the overall time for completing a student's elementary, secondary, and collegiate education and, more specifically, the performance of such accelerated students in a certain college program.

For a variety of reasons, SMPY has encouraged intellectually talented youths with an appropriate educational background to enter college early. By skipping the last one or two years of high school, students can avoid the boredom that results from a shortage of appropriate coursework offered by high schools in their

specific talent areas. Generally, by the senior year, such students have only one requirement left for their high school diploma — which in many cases could be completed by doubling up on English in the eleventh grade, by taking the high school course during the summer, by taking a college English course while still in high school, or by agreeing to take an appropriate English course in the freshman year of college. Early entrance to college helps many talented youth avoid curricular repetition caused by a lack of communication between high schools and colleges and can help them avoid the disillusionment of higher education at the college level that seems too easy during the first few semesters.

Back in the 1950's the Ford Foundation established the "Fund for the Advancement of Education." This group found that in grades 11-13 the following four major flaws existed: 1) a substantial majority of high schools are inflexible and unable to challenge the student to move at his or her own pace; 2) in many cases students are inadequately prepared for college; 3) there is little communication between school and college, resulting in unnecessary repetitions of curriculum; and 4) college programs are inflexible and unable to cope with the differences in aptitude and high school preparation (Fund for Advancement of Education, 1953).

For ten years prior to the establishment of the Fund for the Advancement of Education, the University of Chicago (since 1941) had been admitting students to college who had completed no more than two years of high school. In fact, the early entrance scholars admitted under the Ford Foundation (1951-1954) were only a small fraction of the total number of students entering Chicago who had not graduated from high school. The curriculum at Chicago was designed in such a manner that each student was allowed to move at his or her own pace. Chicago, however, was not the only university to admit early entrants before the Ford Foundation program. Two other institutions of higher education involved in sizable early-entrance programs were the University of Louisville and Shimer College in Illinois.

The attention focused on the various weaknesses of the educational system by the Fund for the Advancement of Education resulted in various concentrated studies that were designed primarily to be potential bridging mechanisms between high school and college. One study of interest, the Program for Early Admission to

College, started with the Universities of Chicago, Columbia, Wisconsin, and Yale. These institutions conceived the idea that many high school students were academically and emotionally prepared for college at the end of their 10th- or 11th-grade year in high school. The fund supported this program, and later eight other colleges (Fisk, Goucher, Lafayette, Louisville, Morehouse, Oberlin, Shimer, and Utah) were included in it.

The published results of this Early Admission to College program (Fund for the Advancement of Education, 1957), which included 130 students (average age initially 16 years and 6 months), were extremely positive. Self-reports indicated that the students did not generally feel handicapped by leaving high school early. In many cases they were glad to leave the stultifying classroom. In a follow-up study of students in the 1951 and 1952 entering groups, the majority of the scholars endorsed early entrance as a viable mechanism. Social and emotional aspects, as studied by Richard Pearson and Dana Farnsworth, led these men to conclude that the Scholars adjusted to campus life as well as their Comparison group and their classmates. Reasons for those who failed were not different than for the average college student. Gradepoint averages were higher than those of the general student population, as were the number of honors and awards the Scholars received. By 1956, all but one of the twelve colleges had established their own early entrance programs, indicating that at least some aspects of the early entrance concept were acceptable to them.

Such acceleration has been shown to decrease academic mortality. Pressey (1949) found that the number of non-accelerated superior students who did not complete the college program was markedly higher than the number of accelerated students who did not finish their studies. By the end of the regular four-year B.A. graduation sequence, over twice as many superior accelerates (those who finished high school in 3½ years or less) had graduated. Furthermore, SMPY found in its first follow-up survey of high school graduates that students who do accelerate through secondary school via grade skipping appeared to have greater aspiration levels and attend more select colleges and universities [based on the Astin (1965) scale] than those who did not (Cohn, Gore, and Becker, 1978.)

Another reason early entrance to college is encouraged by SMPY is based on various studies (e.g., Pressey 1949; Lehman 1953)

which have demonstrated that the most productive and creative years of professional scientific activity occur early in a person's life, often in his or her twenties. Through acceleration, the student can obtain a doctorate or other professional degree sooner and begin a productive career early (Fund for the Advancement of Education 1953; Pressey 1962). Similarly, Zuckerman (1977) has shown that Nobel laureates almost universally show promise early in their careers and that future Nobel laureates obtain degrees and start publishing sooner and more copiously than other scientists: "Those who do well when they are young have a better chance to continue to do well as they get older" (p. 250).

The empirically based studies on acceleration here also show that these highly talented youths do as well as or better than their older classmates. In a follow-up of Terman's gifted group, Oden (1968) found that those who were younger than the average-aged student while attending college were more successful on a variety of scales (e.g., educational attainment, frequency of professional occupations) than their older-aged peers. Pressey (1949) found that accelerated students were more likely to have academic records of "B" or higher, to participate in more extra-curricular activities, and to pursue further degrees after graduation than were regular-aged students. In the Ford Foundation study (1957) the early entrants did better academically than both their total class and their classmates of commensurate aptitude. When comparing the youngest and oldest members of a university graduating class, Eisenberg (1977) found that: (1) academically *on the average* the youngest students did significantly better than the oldest students; (2) more of them made the dean's list; and (3) fewer of these pupils had averages of "C+" or lower. With this background as a basis, SMPY decided to follow the performance of those early entrants or early graduates at The Johns Hopkins University who were accelerated by at least one year in order to see how well they would adjust based on one measure of academic success, the student's academic record.

METHODS

The subjects were 59 students who entered The Johns Hopkins University in either the fall of 1976 or 1977 as beginning students (some of them with sophomore standing) and who had left high

school at least one year early. The 1976 group consisted of 36 students in three subgroups: (A) 11 students who had come through SMPY's talent searches and were sponsored for admission by SMPY; (B) 9 students who had participated in SMPY's annual talent searches but were not sponsored for admission; and (C) 15 students who either graduated or left high school after tenth or eleventh grade and were not affiliated with SMPY. The 1977 group consisted of 23 students in two subgroups: (D) 13 students who had participated in the SMPY talent searches, two of whom were sponsored for admission by SMPY; and (E) 10 early entrants not associated with SMPY. Acceleration was defined as being born on or after 1 January 1959 for the 1976 group and 1 January 1960 for the 1977 group. The 59 early entrants ranged in age at the time of entrance from 15 years and 2 months (three years accelerated) to 17 years 8 months (barely one year accelerated). Two of the students were three years accelerated, 21 were two years accelerated, and 36 were one year accelerated. They were admitted on the basis of the same entrance criteria used for their older-aged classmates and pursued whichever curricula they wished.

The measure of academic success used was the gradepoint average (GPA). Although "academic success" is difficult to measure, GPA is the most common criterion used to rate college students and is one of the variables used in selecting students for jobs as well as graduate, medical, business, and law school programs. In evaluating students over a one- or two-year period, one cannot really determine if the student's total life has been enriched by having entered college earlier than "the average age" for attending post-high-school educational institutions.

At Johns Hopkins, GPA is computed on a 4-point scale where 0.0 is failure (F) and 4.0 is an "A." A gradepoint average of 3.50 on at least 14 credits is needed during a semester to make the Dean's List. The minimum GPA needed to be admitted to Phi Beta Kappa during the senior year was 3.78 for the 1977-78 academic year.

RESULTS

The results of the analysis are presented in Tables I and II. For the four semesters, fall 1976, spring 1977, fall 1977, and spring 1978, the three 1976 early-entrant groups had an average GPA at least as high as the average GPA of the over-500 member

TABLE I
Gradepoint Averages of the 1976 Early Entrants to The Johns Hopkins University
for the 1976-77 and 1977-78 School Years

Group	Fall 1976 Semester				Spring 1977 Semester				Fall 1977 Semester				Spring 1978 Semester											
	N	GPA	GPA ≥ 3.5		N	GPA	GPA ≥ 3.5		N	GPA	GPA ≥ 3.5		N	GPA	GPA ≥ 3.5		N	GPA	GPA ≥ 3.5					
			N	%			N	%			N	%			N	%			N	%	N	%	N	%
A ^a	●	3.21	2	18.2	0	0.0	●	3.32	●	3.32	0	3.32	●	3.43	●	0.0	0	0.0	10	3.32	●	60.0	0	0.0
B ^b	23.1	2.99	3	13.3	0	3.52	2	28.6	2	28.6	5	35.7	2	2.77	2	23.1	0	0.0	9	3.52	2	8.3	2	0.0
C ^c	23.1	2.73	3	13.3	●	26.7	2	28.6	2	28.6	5	35.7	2	2.77	2	23.1	●	23.1	12	3.52	2	8.3	2	16.7
Total	9.4	3.32	4	20.0	4	3.32	2	3.32	2	3.32	5	3.32	2	3.21	2	9.4	9.4	9.4	2	3.32	2	35.5	2	6.5
Class of 1980	559	7.4	77	13.7	57	7.4	534	7.4	534	38	7.4	534	7.4	3.06	122	22.8	28	5.2	520	3.10	146	28.1	34	6.5

a 1976 SMPY-sponsored early entrants

b 1976 SMPY non-sponsored early entrants

c 1976 non-SMPY early entrants

class. Only Group C, the non-SMPY early entrants and early graduates from high school, did not perform as well as the average of the class. A considerably higher percentage of the 35 early entrants than of the entire class of 1980 made the Dean's list each semester, while a similar percentage received GPAs lower than 2.0 (resulting in the student's being placed on academic probation). Discrepancies in achievement become more pronounced when only the two SMPY groups are taken into account. None of these students ever earned a GPA of less than 2.0. The percentage making the Dean's List ranged from a low of 33.3 per cent during the 1976-77 academic year to a high of 55.6 per cent in the fall of 1977 for the unsponsored group (B) and from a low of 18.2 per cent in the fall of 1976 to a high of 60.0 per cent in the spring of 1978 for the sponsored group (A). Fewer than 25 per cent of the entire class received such high grades.

The results were similar for the 1977 entering group, although the difference between the average GPA of the early entrants and the average GPA of the total class of 1981 was even greater. Both the SMPY (Group D) and the non-SMPY (Group E) early entrants earned grades that were better than their classmates. No early entrant failed to earn a GPA of 2.0 or better and, proportionally, twice as many young-in-grade students made the Dean's List.

TABLE II
Grade-point Averages of the 1977 Early Entrants to The Johns Hopkins University for the 1977-78 School Year

Group	Fall 1977						Spring 1978					
	N	GPA	GPA \geq 3.5		GPA $<$ 2.0		N	GPA	GPA \geq 3.5		GPA $<$ 2.0	
			N	%	N	%			N	%	N	%
D ^d	13	3.11	4	30.8	3.11	0.0	0	0.0	5	4	0	0.0
E ^e	11	3.40	3	27.3	3.40	11	0	11	4	3	0	0.0
Total	13	3.11	4	30.8	3.11	0.0	0	0.0	5	4	0	0.0
Class of 1981	556	2.84	99	17.8	64	11.5	546	3.08	152	27.8	40	7.3

^d SMPY early entrants

^e non-SMPY early entrants

During the fall semester of 1977, 7 of 24 early entrants (29.2 per cent) made the Dean's List, as compared to 17.8 per cent of the entire class, and 9 of the 24 (37.5 per cent) received this distinction in the spring of 1978.

SUMMARY AND DISCUSSION

Facilitating the academic programs of highly talented youths is crucially important. Early entrants to college, accelerated by as many as three years, have been shown to perform as well as or better than their age-in-grade classmates. Although academic "success" is difficult to measure, the academic achievement of these accelerated students in college is equal to that of older students. Although the social and emotional effects of acceleration are more difficult to ascertain, the examples of five young men who graduated from The Johns Hopkins University in May of 1977, accelerated by three to five and one-half years, indicate that the "success" of early entrants is not limited to grade point average (Nevin 1977; *Time* 1977). One young man solved a previously unsolved computer problem, while another was editor of a weekly newspaper in a small beach community. Two of the young men presented papers, one on "quarks" for a professional meeting and the other a "finance" paper to a federal committee. All of these "radical accelerants" participated in extra-curricular activities — jobs, golf, bridge, war games, ham radio. The benefits of acceleration can also be seen in even more accelerated students who entered college earlier than 1976 (see Stanley 1976a, Wiener 1953, Zuckerman 1977). If such radical accelerants can adjust to being five to seven years younger than their classmates, certainly a student one or two years younger than average can adjust.

Describing the young students who will do well in college is just as difficult as finding older students who will be successful. Educators have always found it difficult to explain why two students with matched abilities do not do equally well in school. Since motivation is one factor, reaching a challenging level of study at an early age may spur students on to higher levels of achievement. Furthermore, *young* students are not the only ones to have adjustment difficulties in college or to suffer from social difficulties. There is no evidence to suggest that young, highly talented students would perform and adjust better if they waited the extra year or

two. In fact, acceleration appears to *reduce* academic mortality (Presscy 1949). Since accelerated and non-accelerated students do equally well, one cannot assume that the difficulties that do arise are age-related.

There is also some indication that better and more practiced screening will yield students who perform even better. The group of 1977 non-SMPY early entrants (Group E) was more closely screened by SMPY and the Johns Hopkins admissions staff, which is reflected in their high GPAs. Active and concerned educational counseling can further aid highly talented students. With Advanced Placement Program tests and college courses taken while still in high school, most (9 of 13) of the SMPY-sponsored students (Group D) have entered with enough credits to receive sophomore standing. Two of the boys entered with enough credits to receive junior standing!

In conclusion, early entrance to college is an alternative for intellectually talented youths who are eager to move ahead educationally. Most of the early entrants at Hopkins have done well without encountering serious emotional and social difficulties, confirming the findings of the Ford Foundation (1957) in regards to the social and emotional aspects of the scholars who entered college early during the 1950's. Early entrance is certainly a viable mechanism to enable gifted individuals to avoid the oppressive atmosphere of unneeded years of high school and to give them more years in which to be creative and productive. In summary, there is a need for better guidance and greater flexibility in programs at the high school and college level in order to help each individual reach his or her potential. The Johns Hopkins University experience is another positive example that flexibility does work.

REFERENCES

- Astin, Alexander. 1965. *Who Goes Where to College*. Chicago: Science Research Associates.
- Cohn, Sanford J., Gore, Catherine M., and Becker, Betsy J. 1978. SMPY's First Follow-up Study: SMPYers of High-school Graduating Age in June 1976. Preliminary Report. (Unpublished).
- Eisenberg, Ann R. 1977. Academic Acceleration and the Relationship Between Age and Grade-point Average. (Unpublished).
- Fox, Lynn H. 1974. Facilitating Educational Development of Mathematically Precocious Youth. In Julian C. Stanley, Daniel P. Keating, and Lynn H. Fox (eds.), *Mathematical Talent: Discovery, Description, and Development*. Baltimore, Md.: The Johns Hopkins University Press. Pp. 47-69.
- Fund for the Advancement of Education. 1953. *Bridging the Gap Between School and College*, New York: Ford Foundation.

- _____. 1957. *They Went to College Early*. New York: Ford Foundation.
- George, William C., and Denham, Susanne A. 1976. Curriculum Experimentation for the Mathematically Talented. In Daniel P. Keating (ed.), *Intellectual Talent: Research and Development*. Baltimore, Md.: The Johns Hopkins University Press. Pp. 103-31.
- George, William C., and Stanley, Julian C. 1975. Entering College Early: History and Case studies. Paper presented at the APA annual meeting, Chicago.
- Keating, Daniel P., and Stanley, Julian C. 1972. Extreme Measures for the Exceptionally Gifted in Mathematics and Science. *Educational Researcher* 1(9):3-7.
- Lehman, Harvey C. 1953. *Age and Achievement*. Princeton, N.J.: Princeton University Press.
- Nevin, David. 1977. Young Prodigies Take Off Under Special Program. *Smithsonian* 8(7): 76-82.
- Pressey, Sidney L. 1946. Age of College Graduation and Success in Adult Life. *Journal of Applied Psychology* 30(3): 226-33.
- _____. 1949. Educational Acceleration: Appraisals and Basic Problems. *Bureau of Educational Research Monographs*, No. 31, The Ohio State University, Columbus.
- Stanley, Julian C. 1973. Accelerating the Educational Progress of Intellectually Gifted Youths. *Educational Psychologist* 10(3): 133-46.
- _____. 1976a. Use of Tests to Discover Talent. In Daniel P. Keating (ed.), *Intellectual Talent: Research and Development*. Baltimore, Md.: The Johns Hopkins University Press. Pp. 3-22.
- _____. 1976b. Special Fast-mathematics Classes taught by College Professors to Fourth- through Twelfth-graders. In Keating, *ibid.* Pp. 132-59.
- Time. 1977. Smorgasbord for an IQ of 150. June 6, p. 64.
- Wiener, Norbert. 1953. *Ex-prodigy: My Childhood and Youth*. Cambridge, Mass.: The M.I.T. Press.
- Zuckerman, Harriet. 1977. *Scientific Elite: Nobel Laureates in the United States*. New York: Free Press.