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Factors Promoting Scientific Interest or Inquiry From Birth to Age 17

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Abstract. According to outstanding high school students and their parents, outstanding science students most frequently become initially interested in science during the 6 to 9th grades. Parents of these students indicated that teachers are most influential in maintaining interest in science once science interest has begun.

Factors promoting initial scientific interest in children who have become outstanding science students in high school, as well as ages at which this initial interest in science occurs, are of concern in this investigation. Also investigated are factors causing interest of these students in science to continue after an initiation of interest in science has begun.

Data from this initial investigation are descriptive of outstanding science students from Iowa and some other states. These students were selected for the N.S.F. S.S.T.P.S.S.S. (National Science Foundation's Summer Science Training Program for Secondary School Students) of 1960-1963 at the State University of Iowa directed by Dr. Robert E. Yager, professor of science education at S.U.I. High grades and intelligence, as well as proven success in high school in general, were criteria for their selection.

Five hundred and thirty-six questionnaires were sent out to 268 students (ages 16-22) and their parents. Sixty-four percent of the parental questionnaires, and 48% of the student questionnaires were completed and returned. Answers to the following questions were received:

1. When do you feel that the scientific interest began?
2. What do you think started this scientific interest?
3. What factors do you think were most important in causing this interest in science to continue?

OBSERVATIONS

Kindergarten marked the first level at which relatively high occurrances of beginning interest in science occurred. The generally rising rate of "first interests" increased through grade school. Peak rates of initial interest were quite frequent at the 6th, 7th, and 8th grades. A sharp drop in beginning science interest occurred at about age 14 (see figure 1).

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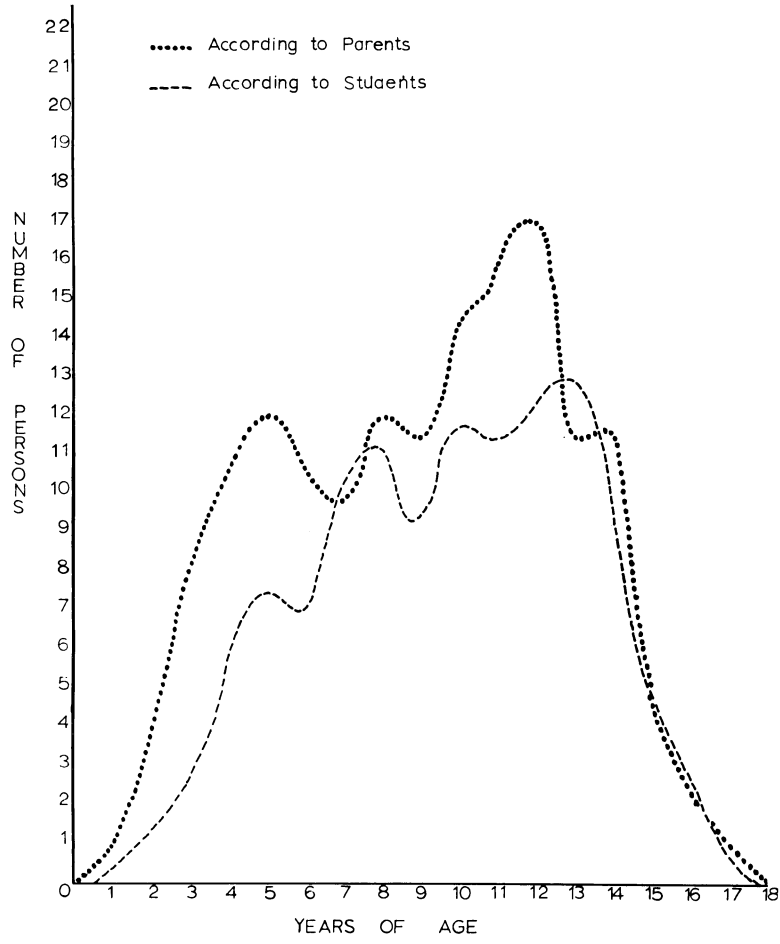

Figure 1. Outstanding secondary science students and their parents indicate peak frequencies of beginning science interest during the 6-8th grades.

Factors Tending to Initiate Scientific Interest. Parents felt that reading was the most important single factor in initiating scientific interest. Teacher and parental influence were indicated about equally in frequency below reading (see figure 2). School as an organization of learning was considered about the fourth most influential stimulus. The importance of having science equipment available was considered next in importance. The impact of nature was thought to be equally important as effects of siblings and friends as initiating factors for science interest. Finally, projects, clubs (such as the Boy Scouts and 4-H), doctors, "scientific" games and toys, other relatives, television, hobbies, exhibits, "the space age," and animals (including

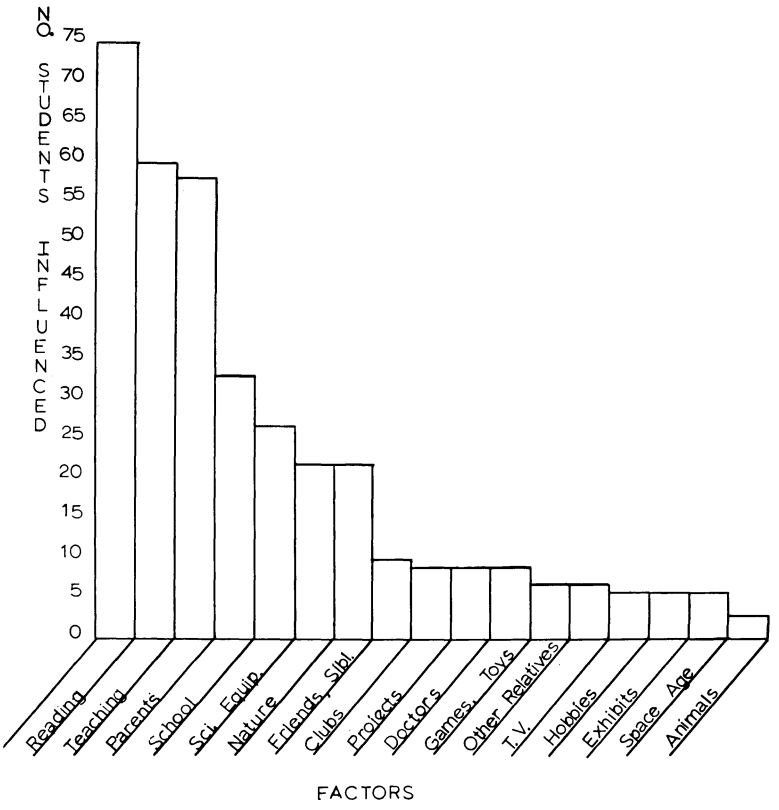

Figure 2. Parents of outstanding high school students indicated that reading was the most influential factor initiating science interest in their children.

pets) were mentioned to be factors which promoted initial interest in science (figure 2).

Factors Causing Interest in Science to Continue. Parents indicated that teachers were more important than any other factor promoting continued interest in science (see figure 3). Teachers stimulated continued interest in science twice as frequently as either of the next three rather "equally listed" factors of reading, school as an organization of learning, and "natural inquiry." Other factors maintaining interest in science were the National Science Foundation's S.S.T.P.S.S.S., space age influences, projects, available science equipment, friends, clubs, siblings, "scientific" games and toys, exhibits, hobbies, doctors, television, test results, and animals and pets.

Discussion

Children who have become interested in science before kindergarten, are probably encouraged in this interest through parental influence. During beginning school years teachers are quite likely

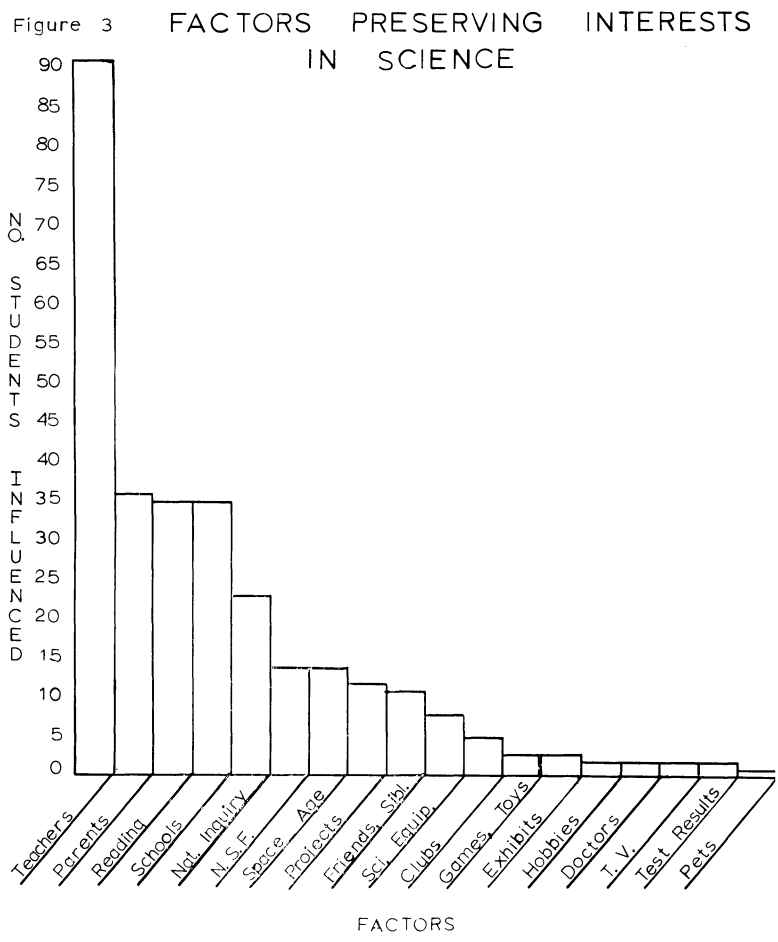

Figure 3. According to parents of outstanding science students, teachers are more influential than any other single factor in promoting continuation of science interest.

the chief single factor in initiating scientific interest. Teachers are evidently the dominant factor in initiating interest until the child has learned to read science-related literature. Reading no doubt remains a very important initiator of scientific interest during the years following, reaching a peak influence in the 6-9th grades. Seventh grade science is often the first "formal" science course in which a student participates. The quality of teachers and the school as an organization, probably are most influential in initiating interest at this time.

Because fewer students are left to gain initial interest, a decline can be expected in the numbers of students becoming interested in science for the first time, around the 9th grade.

However, the sharp drop off during age 14 (9th grade) can be seen to be also the result of competing interests coming strongly into flux along with (and partially a result of) maturity and increasing strength of social stimuli related to this onset of maturity.

If we are to apply the possibilities inferred from the initial data gathered with the goal of stimulating interest in science, we would see that the right kind of parental encouragement is very effective. Furthermore, reading which heads the list of factors promoting initial interest, may be influenced quite markedly by parents, as well as schools and teachers.

No one factor can intelligently be considered as an isolated factor, stripped of influence from the others. The feedback phenomena and interrelationships are in dynamic interplay. Yet, parents, reading, and teachers share the greater portion of influence which attracts young minds to begin with (recognizing the great impetus of "natural inquiry" also involved). Besides initially encouraging and attracting students toward science, according to parents of outstanding science students, teachers of science are the strongest sustainers of this interest of the student in science.

Probably enough of the best young minds are initially interested in science by the 9th grade to supply this nation with scientists, and preserve this nation as the scientific leader of the world. The greater share of the responsibility of nourishing this initial interest falls squarely upon the shoulders of the secondary science teachers and teachers of higher education. Reinitiation of interests anesthetized by previous poor teaching is also a great challenge for these teachers to meet.