Letters

Cholesterol Study

The recent article "Lowered cholesterol decreases heart disease" by Gina Kolata (Research News, 27 Jan., p. 381) reports a study carried out on a group of male volunteers, carefully selected so as to include only subjects exhibiting an abnormally high level of blood cholesterol. The results of the study clearly demonstrated that, at least for this atypical group, a combination of diet and cholestyramine therapy was associated not only with a sharp reduction in heart attacks but also with a similar drop in cholesterol levels. The study's conclusion, however, that the decrease in heart attacks was a direct result of the lowered cholesterol level, would seem to have little basis in scientific logic, particularly in view of the extraordinary complexity of the cholesterol deposition mechanism (Research News, 16 Sept., p. 1164). The additional conclusion regarding the benefits to the general population of cholesterol reduction by a markedly different procedure (that is, by diet alone) rests on even more tenuous grounds, particularly since, from a practical point of view, the effect of diet on the incidence of heart attacks has been shown to be indetectably small.

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Achievement in Mathematics

The results presented by Camilla P. Benbow and Julian C. Stanley (Reports, 2 Dec., p. 1029) on the difference in performance of mathematically precocious boys and girls on the mathematical part of the Scholastic Aptitude Test (SAT-M) test are startling. But what is perhaps more startling is that the authors do not investigate the reasons for these differences. Their results could stimulate new research areas in an attempt to understand the phenomenon. However, instead of suggesting which questions might be pursued, they provide weak rationales for why they think socialization explanations are unlikely.

It appears to us that these findings pose questions that might be grouped into two classes. First, what is the significance of scores on the SAT-M tests? It is conceivable that there is very little significance. For instance, the difference between a 600 and an 800 on the test may have no predictive value for how students will fare in college or in subsequent professional life. The score may say nothing about whether a student will enter a mathematically based career and do well in it. A curious fact, which is perhaps relevant to these questions, is mentioned in an earlier paper by Benbow and Stanley. They report that the girls in this same study did better than the boys in math courses and in an advanced placement math test while in high school (*1*). Clearly, it is assumed that performance in such courses or tests is not a measure of ability while the SAT-M score is. What is the basis of this assumption?

Related to these questions is the nature of the test and the test-taking experience itself. The tests are not just a measure of the capacity to do the problems. They are also a measure of the ability to do the problems in a certain period of time. Could there be differences in attitudes on the part of boys and girls toward this kind of test-taking experience?

Second, despite the hints of Benbow and Stanley, they have not begun to plumb the myriad socialization factors that might provide at least partial explanation for the boy-girl difference. They write, "But it is not obvious how social conditioning could affect mathematical reasoning ability so adversely and significantly, yet have little detectable effect on stated interest in mathematics, the taking of mathematics courses during the high school years before the SAT's are normally taken, and mathematics-course grades." Contradicting the thrust of this statement are the earlier findings of the authors that, in fact, the boys in the study "enjoyed mathematics more than girls ($P = 0.001$)," (*2*) and that boys tended to take math courses at an earlier time than girls in high school (*1*). Although there was not a high overall correlation of liking of mathematics with SAT-M scores, a more detailed analysis might determine the significance of this difference. Their evaluation of students' interest itself is rather cursory, as they merely report whether students stated a "very strong liking," a "fairly strong liking," and so forth for mathematics.

There is a whole body of literature that describes possible ways in which "social conditioning" could affect performance in mathematics (*3*). Studies have shown that, from very early on, teachers pay more attention to boys than to girls in math classes (*4*). This raises questions about whether the students have taken the same courses. They may have sat in the same classrooms, but their learning experiences may have been very different. Other studies suggest that boys perform better in certain mathematics tests because they have had more experiences outside the classroom which involve developing mathematical skills (*5*). Further, Fox *et al.* (*6*), who studied the same children as Benbow and Stanley, report several ways in which the backgrounds of the boys and girls differ, including out-of-class math experience. Benbow and Stanley, themselves, have reported that nearly twice as many boys as girls in their study had participated in special math programs (*2*). Wouldn't it be important, then, to continue to analyze in great detail the history of classroom experiences, family attitudes, and childhood experiences, to determine whether any of these might be responsible for girls' scoring lower?

Finally, the interpretation which Benbow and Stanley have attached to their studies and the publicity they have received are not harmless. Public media reports of a "math gene" (*7*) have already had their influence on students in math classes (*3, 8*). It would be tragic if the attention drawn to this study were to contribute to a reversal of the increased participation of women in mathematics seen in recent years, including a dramatic rise in the number of Ph.D.'s.

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