

Why Russians Excel in Math and Physics

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There is an effect in physics called hysteresis, which refers to the continued detectable presence of a magnetic field after the magnet has been removed.

During the Soviet era, the fields of mathematics and physics attracted a large pool of talented people. They weren't motivated so much by the special privileges the higher caste of academics and officials received or by the way Soviet films glorified them as heroes. The main reason they chose these disciplines was that the most talented and ambitious people were largely banned from fields that they would ordinarily have chosen to pursue.

First, it was difficult for these people to enter business or politics. Second, there was a ban on many creative and cultural fields. Third, within the academic community there was essentially a ban on the social sciences such as economics, political science, sociology and modern history.

These bans had the effect of channeling much of that talent into a few very narrow specializations. It is therefore no surprise that the resulting work in those fields gained international acclaim.

After the Soviet collapse and the end of the ban on these professions, many students and graduates shifted from an emphasis on mathematics and physics to other fields of interest. This redistribution of the country's intellectual capital is the main reason why math and physics professors complain about the low level of students entering these fields. This factor played a larger role than the poor quality of grammar school education in these areas.

The authorities have not paid proper attention to the fact that a larger part of the overall pool of talent prefer business, politics and, to a lesser extent, the humanities. As a result, the average quality among those who do remain in mathematics and physics is much lower than during the Soviet period.

This seems to be a natural process. There was a significant deviation from the norm during the Soviet era, and now there is a gradual shift toward a natural distribution of people among the various specializations. But the longer I work as an educator in the field of economics, including among high school, university and graduate students, the more I think that the shift will be very slow. This is because hysteresis is very strong in human affairs as well.

Many of our incoming university freshmen are much stronger in math than in social and humanitarian subjects. Their impressive command of math and physics is largely because they had excellent high school teachers, many of whom came to those fields owing to the previous ban on other professions.

At the same time, however, they know little about economics and other social sciences. After all, where would high schools and universities with a strong economic programs come from, particularly in the regions, if everybody was studying math and physics 20 years ago? And students are naturally more interested in studying those subjects in which they are already strong.

Thus, reversing the hysteresis in Russia's educational system requires introducing a new source of energy, one that will pull students like magnets into a more balanced and progressive range of fields.

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