

Leaders in Educational Research

Intellectual Self Portraits by Fellows of the International Academy of Education

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ERIC A. HANUSHEK

FINDING THE RIGHT FOCUS

Perhaps there are people who know from early life what they want to do for their life's work, but I suspect they are rather rare. The actual process of getting to the right place, at least from my experience, involves a series of iterations that require learning one's own skills, matching skills with life plans and objectives, and probably something that looks a lot like luck. This essay represents my attempt to extract the separate facets of arriving at my current position as an economist who tries to match evidence about education with policy.

I took a nonstandard route to my current work. I knew as an undergraduate that I wanted to do things that advanced the well-being of society. In itself this goal was not especially surprising. I was an undergraduate at the U.S. Air Force Academy, an institution that preached service to country. Such motivation does not nevertheless point clearly to what I currently do. Thus, I have a military phase with several components; this was followed by an academic phase that morphed into a joint academic-policy phase. Parts of this career are idiosyncratic, but others fit into a clear development path.

THE PATH OF THE MILITARY

Undergraduate Study (1961–1965)

The military phase, lasting from 1961–1974, covered academic training and initial teaching and research. I was a very good student in high school, but the high school was located in an outlying suburban area of Cleveland, Ohio, where at the time there was some interest in college attendance but it was not excessive. The majority of college bound students from North Olmsted were headed toward quite local colleges. I started looking in a wider circle, focusing more on East Coast engineering schools: Rensselaer Polytechnic Institute (RPI) and Massachusetts Institute of Technology (MIT).

But I also became intrigued by reading about the U.S. Air Force Academy (AFA). This was a new institution with modern aluminum and glass buildings at the foothills of the Rocky Mountains in Colorado. The U.S. military had previously been served by military academies for the army (West Point) and the navy (Annapolis). The development of a separate branch of the service for the air force after World War II led to the establishment of this new military school with an inaugural graduating class in 1959.

Military academies are hybrids that merge traditional college with military preparation. While there is a continuous emphasis on military routines and on athletics, the academic side is that of a traditional college with a broad common curriculum and separate disciplinary majors. I applied to the Air Force Academy to be part of its seventh graduating class. This application was not a standard one, however, because it required not only meeting the requirements of the Academy in terms of both academic and physical minimums but also being supported by a member of the U.S. Congress. My parents generally were not particularly favorable to a military academy, but they also had a general view that their children should choose their own paths. Thus my father arranged, through some of his industrial connections, for an interview with our local U.S. representative to Congress, and I was subsequently offered admission to AFA. Again, while my parents thought RPI or MIT would be superior, they supported my choice – based largely on adventure – to attend the Academy.

I began as an engineering major at AFA, but in my junior year I switched to a political science major. This move presaged an interest in how ideas and evidence related to societal outcomes. I became intensely interested in college with how ideas interacted with policies and politics. As I was developing the courses in a political science major I also took my first economics course. The introductory economics course was taught by a person who would end up as my long term mentor, John Kain. It was not a good course. Kain was not a gifted teacher and had limited interest in many of the topics covered in introductory economics. But that course sparked a certain interest in the logic of economics – and in its relationship to things that were observed in society.

I enjoyed school and academic work. But I had never really thought much about continuing in an academic career. Indeed I also enjoyed a variety of things at the Air Force Academy and was motivated toward an Air Force career. I did well in my course work, but I also did well in the military aspects of AFA. In my senior year I was commander of my squadron. (The Academy was organized into military units of roughly 100 people across the four classes. There were 24 squadrons in total, each organized in a clear military hierarchy.)

In my senior year I changed to be an economics major, and I entered into a special program that was designed to lead to a one year master's degree at Georgetown University. This program required that students from the Academy complete a set of graduate level courses while still at AFA. The import of this was direct exposure to a group of clearly exceptional faculty members in the economics department. John Kain, who subsequently went on to an illustrious career as a tenured member of Harvard's economics department, was surrounded by an unusual group. Somewhat by accident, the economics department at the Academy had recruited an unusual faculty – a future president of Brigham Young University, a future tenured faculty member at Ohio State, a future special assistant to the U.S. Secretary of Defense, and a number of well-trained and interesting military officers who spent a time on the faculty. This faculty was atypical of the Academy – emphasizing academic training

and devotion to the discipline of economics more than taking it just as another temporary military assignment.

Over time I came to realize how unusual my training at the Air Force Academy really was. I not only got first-rate preparation in economics, but I also got mentoring in economic thinking and in academic life – something not typical of students at AFA.

Somehow, and I am not sure how, I got the idea that I should apply to graduate programs other than the pre-arranged one at Georgetown University. I collected applications and applied to Harvard University and to MIT. And, somehow, I got accepted at MIT for their Ph.D. in economics. (I remember talking about this possibility with the Associate Dean of the Faculty, who asked me if MIT really had an economics program. By chance, there was a ranking of economics departments in a national news magazine that listed MIT as the second best program in economics at the time, so I could convince the Dean that this was a legitimate program).

Academy graduates were expected to go to pilot training and to begin careers in flying, since that was the only way to become a top leader in the Air Force. Thus, it was rather expected that I would turn down any academic program and go into flight training. (The special nature of the Georgetown program was that students delayed entry into pilot training for one year while they finished their master's degree). However, I applied to the Air Force personnel office for permission to go to MIT instead of entering pilot training. This set off a real conflict among the leadership of the AFA. Because of accidental events that triggered competition between the Dean of the Faculty on the academic side and the Commandant of Cadets on the military side, the Dean became my champion in the unusual quest to go immediately to graduate school upon graduation. And the Dean prevailed, as the military assigned me to graduate school at MIT instead of pilot training.

My early military phase is readily summarized. Compelled by an academic field that I found inherently interesting, I wandered upon an exceptionally good faculty (at a school not known for advanced academic work). While constrained in career paths, because attendance at the Air Force Academy implied a minimum of four years of commitment to military service, I choose a completely novel route of immediate attendance in a Ph.D. program.

Graduate Study (1965–1968)

MIT had (and has) an exceptional Ph.D. program in economics. My first two years of coursework were very standard, ranging across microeconomics, macroeconomics, econometrics, international trade, and public finance. None pointed obviously to a specialization or a dissertation topic. But at this point random events again enter the picture.

During my second year, the U.S. government published the monumental Coleman Report (Coleman et al. (1966). This report, developed by its lead author – the sociologist James Coleman – really introduced the idea of quantitative analysis of schooling issues. The U.S. Office of Education was charged by Congress under

the Civil Rights Act of 1964 to investigate the extent of inequality of educational opportunity afforded to U.S. students. This charge related to the continued struggle to eliminate racial discrimination and was almost certainly designed to show how schools for blacks in the southern states of the U.S. were inferior.

Coleman and his team surveyed some 600,000 students across different grades and across the nation. But instead of just recording the characteristics of the students' schools, they ventured into understanding the outcomes of schooling by giving mathematics and reading tests to all of these students. They then tried to parse out why black students in different regions achieved less than white students. This involved a statistical analysis of how schools, families, and peers affected achievement. Their analysis was widely interpreted as indicating that families were most important in determining achievement, peers next most important, and schools minimally important. These conclusions gained immediate and widespread attention. (Strangely even those in the schools quickly latched onto these results, because they meant that the schools were not responsible for any student failures).

Because of the controversial nature of these findings, Daniel Patrick Moynihan (Harvard professor and later U.S. Senator) and Frederick Mosteller (Harvard statistician) organized a faculty seminar to try to understand both the analysis and policy implications of the Coleman Report. John Kain, my mentor from the Air Force Academy, had joined the Harvard economics faculty by then. He and I had remained close, and I had even done some research assistance for him. He managed to get me invited (as a second year graduate student from MIT) to this on-going Harvard seminar that lasted an entire year.

And that is a key beginning to my current work. From graduate school, I could have worked on a wide range of economics topics – tax policy, international trade, economic theory. I knew that I wanted to work on issue closely related to policy topics. I was still in the Air Force as a graduate student, but I was not inclined to work specifically on military topics. I was slated to return to normal air force duty on completion of schooling, but the Air Force did not require any particular specialization. In the end, the Coleman seminar led me to the study of education.

The Coleman Report was not a very good study from a scientific and statistical viewpoint. In fact one of my first publications, joint with John Kain, was a critique of the Coleman Report (Hanushek and Kain (1972)). But the Coleman Report did two things. It introduced the idea of scientific, quantitative study into education, and it demonstrated that scientific research could enter into policy debates and could influence policy discussions. Both captured my attention and set the course of my career.

I built upon the Harvard seminar and the Coleman Report for my thesis. While the study of education in economics was almost unheard of at the time, I developed a statistical analysis of student achievement for my dissertation. A driving force behind this work was my skepticism that schools had little influence on achievement. I re-

analyzed some of the data collected for the Coleman Report and was led to different conclusions: while families were undoubtedly important, so were schools.

Teaching and Research, Military Style (1969–1974)

Attending graduate school while also being an Air Force officer had several implications. First, I did not have the luxury of leisurely graduate study. The normal military assignment to graduate school was one or two years. I convinced the Air Force that I should stay a third year, largely on the grounds that I had no degree at the end of two years so that it would take at least another year to accomplish anything. In fact the incentives led me to finish my degree in three years. Second, there was no natural next assignment for somebody with a PhD in economics, so I had to be aggressive in finding a position in the Air Force that could use my training. In fact, the department chairman at the Air Force Academy who had assembled such an unusual faculty when I was a student arranged to hire me back on the faculty. Third, with schooling came an ever longer commitment to serve in the military. The four year service commitment at graduation from the Air Force Academy grew to a nine year service commitment upon completion of my graduate studies.

I had no regrets about this military service and career. It seemed like my marginal impact on the Air Force would exceed that of a normal academic research and teaching career. After all, there were few in the Air Force trained in economics, and this seemed like a field with obvious application for the military. But, after two years of teaching at the Air Force Academy, another fortuitous event with long term but wholly unforeseen ramifications added to my current situation. I discovered that I could take a year of temporary duty away from teaching where I would work in Washington, DC, on the staff of the President's Council of Economic Advisors. Again, while still in the military, I had an opportunity to work on the very small staff of economists who give economic advice throughout the federal government. It was exciting, covering a broad range of governmental activities.

After a year, I returned to teaching at the AFA – and faced an event that permanently changed my career trajectory. While teaching, a friend organized a seminar across the military academies on a variety of defense related topics. He asked me to write a paper for the conference, which I did along with a friend – Bill Hogan, currently a chaired professor at Harvard's Kennedy School. The paper focused on how various personnel policies of the Air Force were not in the best interests of the Air Force because they were inefficient and made management of the system difficult.

Who would guess that the Secretary of Defense would attend the seminar? And who would guess that the Deputy Chief of Staff for the Air Force, upon then reading our paper, would be personally offended by the idea that improvements were possible? I was, as a direct result of this economic analysis, fired from the faculty of the Air Force Academy. That was, however, different than being fired from the Air Force, since I

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still had many years remaining on my service commitment. This led to a considerable battle about what I would do in the Air Force. (This period was the most intense time of the Vietnam war, so my participation in that was always an option).

Leaving the Air Force Academy but remaining in the air force led to a somewhat bizarre period only interesting in terms of military sociology. My case was championed by the chairman of the Council of Economic Advisers and ultimately led to a temporary assignment (decided by the Secretary of Defense) to the Cost of Living Council. (This was part of a short period where the federal government controlled wages and prices). When the Cost of Living Council shut down permanently after I had been there for a year, I returned to assignment at a military base. The assignment was ostensibly an analytical one, but there was in reality little interest in much analysis. (I did use the time to make progress on writing a statistics text for social scientists, since original research was not easily done at that time. My squash game also improved with the limited demands on my time.) After a short period of time, the Air Force and I mutually agreed that I would not be very useful to them, and I was relieved of my service commitment.

The military period: excellent education, somewhat unplanned field of specific study, experience with the interplay of analysis and policy, and an open career. In short, a personal commitment to public service led without prior design to advanced study in economics, to initial research on education, and to uncertainty about future research and career.

A CAREER PROFILE (1974 TO TODAY)

Economists did not analyze education. I had been attracted to it by the special circumstances of the Coleman Report, but the number of economists working on education per se (as opposed to how education affected the labor market) could be counted on one hand in the mid-1970s. Lucky for me, Yale University was starting a special institute to study social policies, and I was offered a job in that institute and in the economics department. At that time, however, I was not committed to studying education. I did a variety of studies of urban housing and of labor markets, but there was a continuing interest in education out of my prior work.

After four years at Yale, I was offered the chance to direct a new degree program in public policy analysis at the University of Rochester. This appealed to me, because of my interest in training people for public service. I had my first tenured appointment as Professor of Economics and of Political Science. After an interesting and exciting four years in the public policy program, I shifted my attention to being chair of the economics department – a job I held off-and-on for some ten years. In terms of administrative work, I subsequently founded the Wallis Institute of Political Economy, a joint venture of the Rochester economics and political science departments. I did this administrative activity for eight years. Starting new activities – the public policy program and the Wallis Institute – were enjoyable and interesting

because of the entrepreneurial aspects, but administration itself was not. I did the administrative chores largely because “somebody had to do it.”

I did take leave from the University of Rochester in the mid 1980’s to serve two years as the Deputy Director of the Congressional Budget Office (CBO). CBO is the economics office for the U.S. Congress and is charged with evaluating the implications of all federal legislation. As Deputy Director, I could range across the full extent of federal government programs. The CBO is formally charged with estimating the cost of all new federal legislation. It is also at the frontline of converting research and evaluation into policy. This experience at CBO further heightened my appreciation for the value of reliable evidence in making policy decisions. Relevant and reliable evidence does not always win the day, but it certainly expands the possibility of good government decisions.

CBO was a short interlude from 22 years at the University of Rochester. The Rochester experience included working with a small but very highly ranked economics department. It also included a strong dose of interdisciplinary thinking and research.

In 2000, I was offered my current position as senior fellow at the Hoover Institution of Stanford University. This position is a full time research position. Although I always enjoyed teaching and thought that my teaching was important, I have taught just a few courses at Stanford – concentrating on research.

EDUCATION RESEARCH

By about 1980, I began to specialize my research activities in the economics of education. This specialization simply evolved. It was not part of any grand plan. The evolution partly reflected some of the early research success in influencing the course of the newly developing subfield of the economics of education.

My research has traversed a wide set of topics. From my earliest work, there was an interest in the determinants of differences in student achievement. This topic, which economists tend to label an educational production function, largely focuses on how differences in inputs to education (families, peers, schools, and abilities) affect student outcomes (Hanushek (1979)). A second major line of work looks in the opposite directions: how do differences in student achievement affect later outcomes such as continuation in school, labor market success, or overall productivity in the economy.

There are many detailed studies along these two major themes. I have always thought, however, that intellectual influence comes from invention: the most powerful impact of research comes from producing new and lasting changes in the way people think about issues. Thus, I think that my research career is best understood by identifying what I consider to be my key research findings. Each of these lines of research has been the center of controversy – largely because each has direct relevance to public policy. Perhaps it is one’s own rose colored glasses, but it

seems that the key conclusions from initial studies have survived controversy and have become rather the established wisdom.

Finding #1: There is no consistent relationship between school spending and student achievement. As part of my research, I compiled all of the existing evidence on how school resources were related to achievement. And, I was stunned to discover that the prevailing evidence provided little support for improving schools by simply increasing the funding of schools.

When I first described these results in the early 1980s, the world was completely skeptical (Hanushek (1981)). Indeed, those who had advocacy positions that called for increased school spending held that these results were truly evil – often trying to suggest that the findings were politically, and not scientifically, motivated. This finding did a lot to shape the nature of research by economists and other quantitatively inclined people for the next two decades (Hanushek (1986, 2003)). A number of new researchers, including an increasing number of economists, were drawn into the study of education, and there was continuing debate about whether added resources were or were not correlated with student outcomes. There were on-going debates about how to do the appropriate analyses, about how to aggregate the results across studies, and about the implications for policy (Burtless (1996), Hedges, Laine, and Greenwald (1994), Hanushek (1994), Krueger (1999)). Gradually the scientific consensus shifted to the current widely acknowledged view: It matters much more *how* money is spent than *how much* is spent.

Finding #2: Teachers are the most important part of schools, and there is a large variation in the effectiveness of teachers. In my earliest research growing out of my thesis, I investigated how to measure the relevant aspects of teachers and schools. This work quickly centered on the role of teachers, but not as measured by the standard identifiers of teacher quality: graduate education, experience, certification and the like.

The key perspective, first published in 1971, was to focus on an outcome-based measure of teacher effectiveness (Hanushek (1971)). In simplest terms the perspective was that an effective teacher is one who gets large learning gains from her class; an ineffective teacher is one who gets limited learning gains. The important issue, of course, is separating the portion of any student learning gains that can be attributed to the teacher from student learning gains that come from other sources.

The investigation of value-added of teachers has shown the range of effectiveness of teachers. In a study of mine published in 1992, it was found that a good teacher could get 1 ½ years of learning from her students each academic year (Hanushek, 1992). A poor teacher could get ½ year of learning in an academic year, implying that there could be a difference of a whole year's worth of learning in a single academic year depending on a student's assignment to a particular classroom. This outcome-based measure is the heart of all current discussions of teacher value-added. It has also developed into a large and vibrant research area. It is the subject of considerable

current controversy, particularly as versions of this are discussed for the evaluation of teachers and for the pay and retention of teachers.

This discussion has also moved directly into the policy realm. A number of state legislatures have directly called for using student outcomes in evaluating teachers. Other state policy agencies have been working to develop value-added measures. And, various districts including Washington, DC, have begun using value-added measures along with other evaluation measures to give bonuses to teachers and to dismiss teachers.

Finding #3. Student achievement, as measured on international assessments, is closely related to aggregate long run economic growth of nations. With much of the quantitative research on education focusing on student achievement, it is important to understand the implications of having higher achievement. In work beginning in the 1990s, I have shown that economic growth of nations is closely related to skills as measured by mathematics and science scores (Hanushek and Kimko (2000), Hanushek and Woessmann (2008)).

Of course, such correlations across nations are unconvincing by themselves. This correlation does not prove causation, and indeed there is wide disagreement about how to interpret these results. In other work, however, we have been able to eliminate a number of possible threats to causality such as cultural differences and variations in the quality economic institutions (Hanushek and Woessmann (2012)). The relationship shows huge impacts of skills on economic performance of nations. For example, if Peru (a very low performer) had achievement at the developed country average, the estimates suggest that its growth would be 2 percentage points higher over the past half century. On the other side, if Korea's achievement were not high but instead the developed country average, its growth over the period would have been 2 percent less. In other words, the skills measured on these tests indicate the skills of the labor force, and these skills directly affect economic growth.

THE RELEVANCE OF EDUCATIONAL DATA

One of the most gratifying developments over my career has been the growth of the economics of education. While it was a lonely field in the beginning, many of the best PhD students in economics now enter into the subfield. This partly reflects the growing recognition that education has an enormous impact on individuals and on society. But partly it reflects the increased availability of rigorous empirical that make analyses possible.

One of the early catalysts for the area was the development of large administrative data bases that recorded student performance over time and could be used to relate outcomes to various programs and school inputs. Perhaps the forerunner to this development was the Texas Schools Project. Begun by the initial input of John Kain and developed as a joint venture with me and subsequently with Steve Rivkin, this

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research center at the University of Texas at Dallas showed how the regular school and student accountability data could be put together into a longitudinal data base for students (<http://www.utdallas.edu/research/tsp-erc/>). By collecting multiple years of student achievement information across different grades, it was possible to develop large scale statistical models that could test for the effects of various factors from teachers to special education to school desegregation to charter schools (Hanushek, Kain, and Rivkin (2002, 2009), Hanushek et al. (2007), Rivkin, Hanushek, and Kain (2005)).

The power of analysis of such panel data on student performance became quickly evident. A similar center was established in North Carolina. Florida expanded on the idea by developing a state data warehouse that brought together data from a variety of sources in one comprehensive data structure. And, New York State and New York City began releasing data to researchers. Now a wide variety of states, encouraged by grants from the federal government, have constructed databases that are usable for research.

New researchers can now efficiently enter into work on the economics of education with a wide range of relevant data sources. And this has been compelling to a large number of economists.

INTERACTIONS WITH THE COURTS

I define my career as one of scientific research, trying to bring rigorous analysis to the field of education. But there is one important offshoot. Since the early 1970s, I have been involved in some 20 different school finance court cases.

In the U.S., the funding of schools is largely an activity of states and local school districts with the federal government providing just ten percent of the overall funding. Since the late 1960's, a number of parties have tried to use the legal system to alter both the level of funding and the distribution of funding across districts. The nature of my research has brought me into these court cases – almost exclusively as an expert witness for the state government that is the defendant in the case. As an economist who was trained in public finance issues and who had studied the determinants of student achievement in my dissertation, it was natural that I would be involved. The courts have drawn varying conclusions from the evidence on schools and their finance (Hanushek and Lindseth (2009)), but there is no denying that these cases represent a very direct path for using evidence in making educational policy.

The involvement in these court cases highlights another aspect of working close to the policy side of education. In court cases, people are clearly lined up on one side or the other. And, the issues being discussed are ones that people get emotional about. Partly the decisions could directly affect the jobs and careers of some. Partly people just have strong opinions about education. As such, involvement opens one up to a variety of attacks that go far beyond normal academic disagreements.

The courts heighten the emotions that are tied to educational research, but the same emotions are present outside of the courtroom. This facet of educational research – one that took me a while to understand – is simply part of working in an important area where research findings can quickly enter into the policy dialogue.

WHAT DOES IT MEAN?

At this point I am personally satisfied with how the various random elements came together to put me in my current position. I probably could have been happy as an international trade economist studying the impacts of tariffs and trade barriers, or as a researcher in a wide variety of areas. Education is surely not the only area where research relates directly to social outcomes. Nor is economics the only way to approach a number of these questions.

An important part of my career (any career?) is crossing paths with important mentors and colleagues. John Kain, who was best known for studying urban economics and not education, had an enormous impact on how I developed – and only late in his career did he move into education, largely as my mentee and collaborator. Steve Rivkin and Ludger Woessmann became lifelong collaborators soon after meeting. And various students such as Dennis Kimko, Lori Taylor, and Javier Luque passed from student to colleague.

Nonetheless, my study of the economics of education – unplanned and having fortuitous random events – demonstrates how working through the various decisions that enter into most career developments can lead to satisfying results. Predictable? No. The only path? No. Productive and satisfying? Yes.

At the beginning of the career path, less is the result of active decisions and more is the result of chance occurrences. Over time the mix of active choices and random events tends to move more toward clear-cut choices. Nothing of course predicts the individual people who become important elements of the research program, but it is possible to predict that somebody will fill that role.

FAVORITE WORKS

- Teacher characteristics and gains in student achievement: Estimation using micro data. (1971).
- Education and race: an analysis of the educational production process.* (1972).
- Throwing money at schools. (1981).
- The economics of schooling: Production and efficiency in public schools. (1986).
- The trade-off between child quantity and quality. (1992).
- Making schools work: Improving performance and controlling costs.* (1994).
- The failure of input-based schooling policies. (2003).
- Teacher deselection. (2009).
- New evidence about *Brown v. Board of Education*: The complex effects of school racial composition on achievement. (2009). With Kain and Rivkin.
- Schooling, labor force quality, and the growth of nations. (2000). With Kimko.
- Schoolhouses, courthouses, and statehouses: Solving the funding-achievement puzzle in America's public schools.* (2009). With Lindseth.

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Endangering prosperity: A global view of the American school. (2013). With Peterson and Woessmann.
Does school accountability lead to improved student performance? (2005). With Raymond.
Harming the best: How schools affect the black-white achievement gap. (2009). With Rivkin.
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