



CAN A NON-SCIENCE MAJOR BECOME A SCIENTIST?

A Study of College Majors and Future Occupations

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BACKGROUND

As an academic adviser to undergraduate college students at a liberal arts college with strong curricula in the arts, humanities, and social and natural sciences, I'm often asked questions that boil down to "What kind of job, *other than teaching*, can I get if I major in XXX?" Most often, XXX is a discipline in the humanities or arts, or perhaps history, anthropology, or sociology. This inquiry is rarely – though occasionally - made about disciplines such as business, chemistry, or economics.

My response always comes easily: "A liberal arts education is more about the development of skills and qualities of mind than about mastery of content. With the right skills you can master new content from many sources and you will develop your skills more fully doing something you love. Employers are typically most interested in really smart people who are skilled in writing and analytical thinking, and have other intellectual aptitudes and interests. Employers *then train such people* for the particular job in question."

I believe that most of my colleagues give answers that fundamentally resemble mine. Students, and sometimes their parents, generally nod in agreement, but often reveal some subtle anxiety, perhaps an indication they are less than completely confident in my response. We then pleasantly move on to other topics.

THE QUESTION

This uneasy equilibrium persisted until I had a small shock of my own; as my older child began to approach the age of "What do I major in?" this became a personal question that was now not so easy to answer. Did I really believe the advice I'd always given? As a data-driven economist by training, did I have evidence to support the "you can do anything" claim? This personal question connected with my professional duties, because one aspect of my current position is to research the educational outcomes of the liberal arts education provided by my small liberal arts college. I was fortuitously positioned to do some research that would illuminate both my personal and professional lives.

THE ANSWER

Fortunately, colleges and universities have Development Offices with sophisticated alumni databases. Notwithstanding some gaps due to unreported information, the databases provide a fascinating glimpse into the question: How does a student's undergraduate major correlate with his or her future occupation?

In the decade between 1995 and 2005 there were 1,871 alumni for whom I could link undergraduate majors with subsequent occupations. I divided occupations into nine broad categories: Industry, Finance, Communications, Law, the Public Sector, Health, Science, Education, and Retail. A more detailed description of these categories follows:

| Area | Description |
|----------------|--|
| Industry | Transportation, Utilities, Manufacturing, Consumer Products |
| Finance | Accounting, Consulting, Banking, Finance, Insurance, Real Estate |
| Communications | Advertising, Marketing, Public Relations, Journalism, Media |
| Law | Attorney, Paralegal |
| Public Sector | Civil Servant, Lobbyist |
| Health | Physician, Dentist, Veterinarian, Other Health Professions |
| Science | Environmental Science, Scientific Research, Scientific/Technical Fields, Engineering |
| Education | Primary/Secondary Teaching or Administration, Professor, College Administration, Libraries |
| Retail | Hospitality, Retail/Food Chains, Sales |

The findings can be viewed from either the perspective of “What do those who majored in XXX end up doing?” or the converse “What were the majors of those now working in XXX?” Since I am writing this for a medical journal, I will focus on findings most relevant to health professionals.

40% of majors in Biology, Neuroscience, or Animal Behavior chose Health careers. An additional 32% went into other Science fields, but 7% work in Finance. The experience of Chemistry majors is similar: 27% work in Health. An additional 38% work in Science, and 13% work in Finance.

But what do people do after majoring in one of the humanities like English? The most common careers for English majors are in Communications (26.8%) and Education (26.2%), but that’s hardly the whole story; next comes Finance (15.5%), then Retail (8.9%), Law (7.1%), Industry (6.0%), Health (4.8%), Public Sector (3.0%), and Science (1.8%). It’s about much more than Communications and Education!

The Government major offers more surprises. While 33.5% of Government majors go to Law, 20.6% go to Finance - more than to the Public Sector (13.9%). Finally, 3.9% go to Health.

Let’s look at this from the other direction, a perspective that is in many ways more informative. Instead of asking where those majoring in a particular area *go to work*, let’s ask where those in a particular area of work *come from*? In particular, where do those working in Health come from?

| UNDERGRADUATE MAJORS OF ALUMNI IN HEALTH CAREERS | |
|--|-------|
| • Biology* and Chemistry | 49.0% |
| • Psychology | 13.9% |
| • Sociology or Anthropology | 10.9% |
| • Government | 5.9% |
| • English | 4.0% |
| • Miscellaneous** | 16.3% |
| * Including Neuroscience and Animal Behavior. ** Including Classics, Mathematics, Music, Philosophy, Physics, American Studies, Theater, History, Foreign Languages, Business, and Economics. | |

We see a similar pattern in Finance. While 44.3% of those working in Finance majored in Business (including accounting and finance), and 7.7% majored in Economics, 48.0% majored in other areas. These include Government (11.8% - more than in Economics!), English (4.8%) and History (3.7%).

WHAT ABOUT PHYSICIANS?

For this question, I was able to bring into play more precise data compiled by our pre-healing arts adviser regarding students who were accepted to allopathic medical schools during the five-year period 2004-2008.

Of the 88 students in this category, 73 completed a major in Biology, Biochemistry and Molecular Biology, Neuroscience, or Chemistry. An additional 5 completed majors in Public Health (a student-created major) or Psychology. Of these 78 students, 15 completed double majors, and 14 of the 15 second majors were with a department in the humanities or social sciences.

This means that 10 students (11.4%) did not have one of the traditional science majors or even a major that could be connected to medicine (Public Health or Psychology). While they took the courses required for medical school, they majored in seemingly unrelated areas, including History, Government, Anthropology, Classics, Philosophy, Sociology, and Art. Not only is it possible to go to medical school without majoring in a science-related area, it happens with some frequency!

It’s also worth noting that among these 88 future physicians, if we count both double majors and single majors outside related areas, 24 (27.3%) completed a major unrelated to medicine. More future physicians than we might expect had quite diverse baccalaureate backgrounds.

I believe these data are consistent with the historic answer my colleagues and I have customarily given; there is at best an imperfect connection between undergraduate major and eventual occupation, and occupational goals can be reached by many different paths.

What, other than teach, can you do with a history major?

Just about anything.

ACKNOWLEDGMENT:

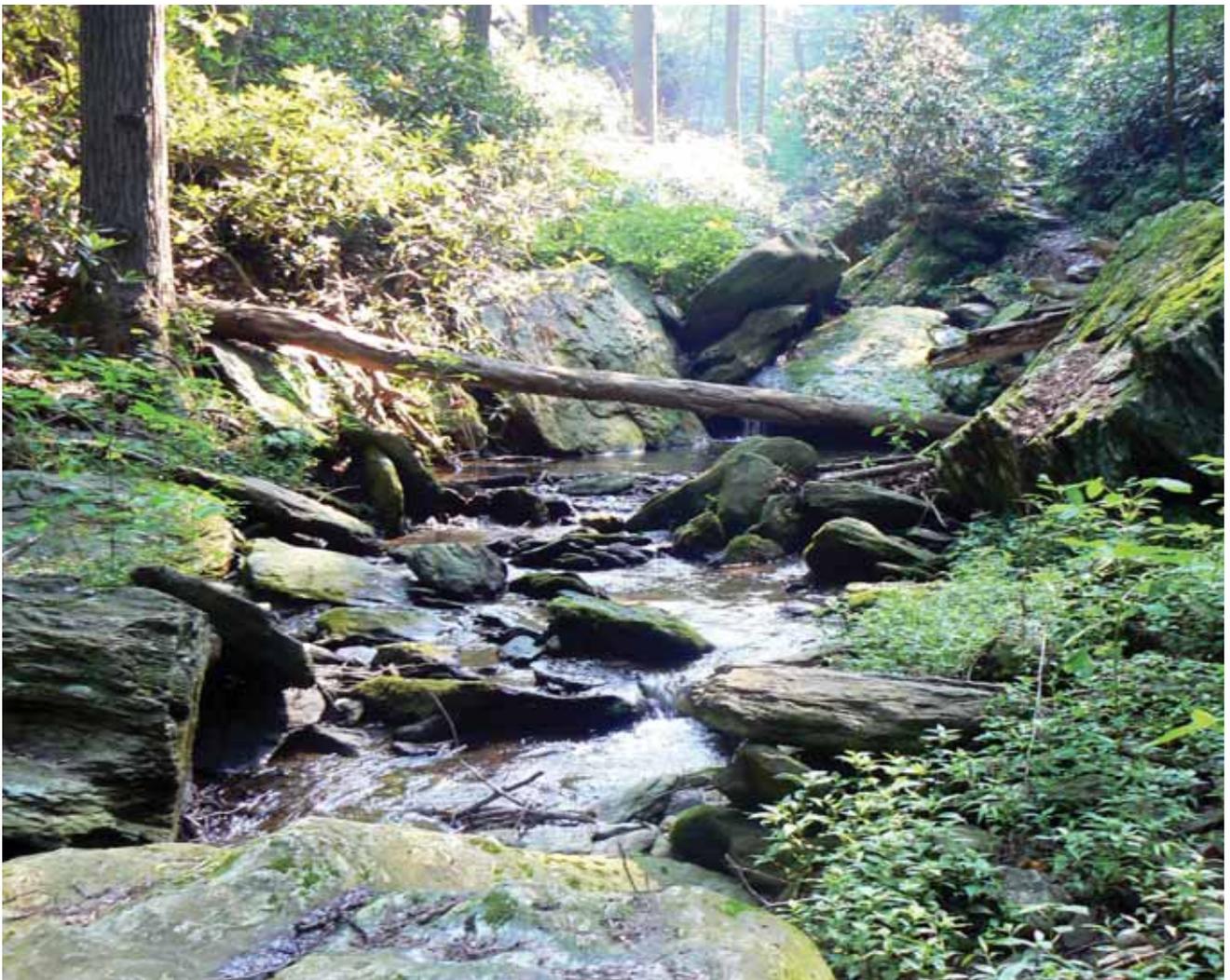
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