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Why are there so few women in information technology? Assessing the role of personality in career choices ☆

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Abstract

Despite increases in female labor force participation, women remain substantially under represented in most scientific and technical fields. The small number of women in engineering, physics, chemistry, computer science and other similar fields has variously been attributed to discrimination, differences in ability or choice. This paper uses a unique data set containing information on vocational interests to examine the determinants of entry in to Information Technology occupations. We show that men and women differ systematically in their interests, and that these differences can account for an economically and statistically large fraction of the occupational gender gap.

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1. Introduction

Despite the very substantial gains that women have made in the labor market over the past half-century, they remain substantially under represented across a range of technical and scientific fields. Although women make up nearly 47% of the labor force today, less than 20% of most engineering professions are female, just 27% of environmental scientists, 31% of chemists, and 27% of computer and mathematical occupations are female.[1] Given the importance of these technical fields in our modern economy, and the rapid expansion of employment opportunities in technical occupations, the dearth of women in these areas is puzzling from an academic perspective. It is also troubling from a policy perspective since it suggests that the nation's technical workforce may be failing to fully capture the creative energies that are potentially available.[2]

The reasons why women have made such slow progress in gaining entry into science, math, engineering and technology remain unclear and in some cases quite controversial, a fact illustrated by the intense debate stimulated after Harvard President Larry Summers speculated at a January 2005 Conference on the possibility that differences in the distribution of ability among men and women might play some role in the small numbers of women at the highest levels in science.[3]

The dearth of females in technical fields is part of a larger phenomenon of occupational segregation by gender. Fuchs (1988, pp. 34–35), for example, noted that in 1980, the Duncan Index of occupational dissimilarity implied that differences in occupational segregation were nearly twice as great by gender as they were by race, and had fallen much more slowly over the previous 20 years. Although calculations of the Duncan Index using 1990 and 2000 census data show a continued modest decline in gender segregation, they still indicate that it would be necessary for more than 50% of women to change jobs to achieve an equal distribution of men and women (Jacobsen, 2007, Table 6.4).

Explanations for these occupational differences can be grouped under three broad headings: (1) discrimination; (2) differences in ability; and (3) choice.[4] Explanations based on

[1] These figures are derived from summary statistics drawn from the 2004 Current Population Survey downloaded from the Bureau of Labor Statistics. The number of women among all scientists and engineers has been increasing over time. Long (2001, p. 64) reports that the number of women scientists and engineers rose from about 7% of the workforce in 1973 to about 15% in 1995.

[2] The importance of the issue of workforce diversity from a policy perspective is reflected in the numerous programs offered by the National Science Foundation to increase female and minority participation in technical subjects. See Xie and Shauman (2003, pp. 4–6) for an elaboration of these points.

[3] A transcript of Summers' remarks is available on the Harvard University website http://www.president.harvard.edu/speeches/2005/nber.html; as is a subsequent letter to faculty responding to concerns raised following the initial remarks http://www.president.harvard.edu/speeches/2005/facletter.html.

[4] Xie and Shauman (2003, p. 2) suggest organizing explanations within the framework of supply and demand factors. Differences in ability and preferences are both factors that operate on the supply side to depress entry of women into technical careers, while discrimination would be a demand-side factor reducing opportunities for women to enter technical fields.