Are more college graduates really taking 'high school' jobs?

A disaggregation of data by gender, age, and time period is needed to separate widespread anecdotes and misinterpretations from the facts

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Upward mobility through education is a central belief in American society. Since World War II, this belief has centered increasingly on the value of a college education. But twice in the last 25 years, the economic value of college has been called into question by labor market developments.

The first challenge arose in the late 1960's and continued through the 1970's as college-educated baby-boomers surged into the labor market and sharply depressed a college diploma's economic return.[1] By the early 1980's, however, wages for workers with fewer years of education had plummeted while the earnings of college graduates held their own. A college education looked like a good investment once again.

The second challenge came in a 1992 *Review* article by Daniel Hecker, a Bureau of Labor Statistics economist. Using occupational and demographic data from the Current Population Survey, Hecker estimated that in 1990, 20 percent of all workers with college degrees were either unemployed or employed in jobs requiring only high school skills.[2] This figure, he argued, had risen significantly since 1970 when only 11 percent of college-educated workers were similarly "underemployed." Put simply, there were too many college graduates.

Hecker's article, published during the 1989–92 white-collar recession, was quickly taken up by the popular press. For example, in an August 1992 *Newsweek* column, economics reporter Robert Samuelson wrote that Hecker:

> ...convincingly demolishes the notion that there's a scarcity of college graduates and that sending more Americans to college will automatically create a more productive economy... [If] more people had gone to college in the 1980s they would have competed mostly for lower-wage jobs that usually don't require a degree.[3]

Similarly, the *New York Times* reporter, Sylvia Nasar, wrote a story in which she emphasized the irony of Hecker's findings coming at a time[4]:

> when college enrollments are at record levels, tuition is at an all-time high and the most costly item in Bill Clinton's economic plan is a program to send everyone to college who wants to go.

Hecker's message was updated and reinforced in 1994 by BLS economist Kristina Shelley who warned:

> The employment outlook for college graduates between 1992 and 2005 is like a weather forecast in the midst of the summer doldrums: Tomorrow will be a rerun of today—or a little worse.[5]

Each of these articles contains the same warning: the economy is generating college graduates faster than it is generating jobs for those graduates; potential college students and those who design educational policy ignore this fact at their peril.

This article demonstrates, however, that the warning is largely misguided and that a college education continues to have significant economic

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value. We reach this conclusion by probing the details of Hecker's analysis. We show that Hecker's conclusion stems, to a large extent, from his decision to focus on a highly aggregate statistic: the 1970–90 change in the proportion of all college graduate workers holding high school jobs. Persons who are concerned with the value of a college degree —potential students and their parents, and policymakers—need to look specifically at *recent* changes in the job market for *young* college graduates.

To see why this is so, note that Hecker's main finding may reflect any of several, quite different situations:

- A growing number of recent college graduates working in jobs for which they are over-educated (This is the situation that has been emphasized in media summaries of Hecker's papers.)
- A growing number of middle-aged college graduate managers losing their positions in the 1980's, during the restructuring of white-collar jobs.[6]
- Job market events that took place in the 1970's, and have little relevance for current career-related decisions.

If, in this period of rapid technological change, younger college graduates and older college graduates are not close substitutes in employment, only the first of these situations would raise serious doubts about going to college today.

In a similar vein, more detail is needed on the meaning of "high school jobs"—jobs that seem to require only a high school education. As Samuelson suggests, Hecker's readers assume a high school job is one which pays a wage commensurate with a high school education even to a college graduate. But this is only an assumption because Hecker does not report wage level data. College graduates in high school jobs will probably have lower earnings than other college graduates, but they still could earn more than high school graduates in similar jobs. Anecdotal evidence suggests that skill requirements have been rising within some occupational titles. If that has happened, it is possible that certain jobs requiring a high school education now require college graduates and employers are willing to pay to get them.

For Hecker's findings to be relevant to today's college-related decisions, three conditions must hold:

- The 9-percentage point increase in the share of college educated workers in "high school jobs" between 1970 and 1990 must be a continuous development— not a development confined to the 1970's.
- Recent increases in the proportion of college educated workers in "high school jobs" (if increases exist) must include recent college graduates—not just older workers.
- "High school jobs," as Hecker defines them, must pay "high school wages" to anyone who holds them, including college graduates.

This article addresses each of these points and shows that each is largely false. In absolute terms, 25–34 year old college graduates in 1989 were doing as well as (for men) or better than (for women) their 1979 counterparts. This conclusion applies to both young college graduates, and young postgraduates.[7] To the extent that a growing proportion of college graduates took jobs requiring only a high school education in the 1980's, this article illustrates that it was older men (not women), who were the victims, in part, of white-collar restructuring. By contrast, young men and women proved adept at moving into occupations that were expanding and had high wages.

The time path

Point I. As Hecker demonstrates, the proportion of college graduates and post-graduates who are either unemployed or in jobs requiring only a high school education rose from 11.3 percent in 1970 to 19.9 percent in 1990. This difference has been widely quoted; the path between the two points has received less attention. That path, reproduced from Hecker's article, shows that most of the rise—from 11.3 percent to 18.6 percent—occurred between 1970 and 1980. Between 1980 and 1990, the proportion increased only by an additional 1.3 points. (See table 1.)

The concentration of the problem in the 1970's is what we would expect when a steady demand shift from high school graduates toward college graduates was overwhelmed by a surge in the supply of college graduates.[8] As we noted, the 1970's were the decade in which the big, well-educated cohorts of the baby boom first began their careers. Between 1970 and 1980, the number of workers with at least 4 years of college grew an astounding 7 percent per year. From 1980 to 1989, the number of workers with at least 4 years of college grew 4.5 percent per year,[9] a figure more in line with the economy's absorptive capacity and future supply growth.

In sum, the supply of college graduate workers grew at a

Table 1. Percentage of college graduates in "high school type" jobs, selected years, 1967–90

Year	In "high school type" jobs or unemployed	In "high school type" jobs
1967	11.7	10.9
1970	11.3	10.0
1975	16.7	14.2
1980	18.6	16.9
1985	19.2	17.1
1990	19.9	17.9

SOURCE: Daniel E. Hecker, "Reconciling conflicting data on jobs for college graduates," *Monthly Labor Review*, July 1992, pp. 3–12.

robust annual rate in the 1980's, while the proportion of these workers in high school jobs increased only a little. This suggests that at least aggregate demand for college graduates remained strong in the 1980's. But strong aggregate demand for college graduates could mask falling demand for young college graduates newly entering the labor force.

Young college graduates in the 1980's

Point II. Did the modest 1980's shift of college graduates into high school jobs mask a bigger shift among young college graduates? To answer this question, we examine changes between 1979 and 1989, using data from the 1980 and 1990 Public Use Microdata 1 percent Samples from the U.S. Census.[10] To keep our analysis manageable, we focus on eight (age/sex/education) groups of workers:

- 25- to 34-year-old men and women with exactly 12 years of schooling.
- 25- to 34-year-old men and women with exactly 16 years of schooling.
- 45- to 54-year-old men and women with exactly 12 years of schooling.
- 45- to 54-year-old men and women with exactly 16 years of schooling.

Where Hecker combined 4-year college graduates and postgraduates, we focus on 4-year college graduates—whose job experiences are most relevant to young people considering college. Using these groups, we can see whether different age/male/female groups of college graduates took high school jobs at different rates. We can also measure the experience of 1989 college graduates against two yardsticks: 1979 college graduates, and high school graduates in 1979 and 1989.[11] The experience of postgraduates are discussed later.

Table 2 describes the 1979 and 1989 labor market experience of our four groups of college graduates: 25- to 34-year-old (hereafter, "young") men and women and 45- to 54-year-old (hereafter, "older") men and women. The table includes data on each group's median earnings in 1990 dollars and the proportion of each group in "high school jobs," using Hecker's occupational classification.[12]

Neither young women nor young men (nor older women) display the kind of labor market decline implied by Hecker's article. Among both young and older women, 1989 median earnings were higher in 1989 than the earnings of their 1979 counterparts. Similarly, the fractions of young and older women in jobs requiring a high school education were lower in 1989 than in 1979. Young men similarly show no deterioration: median earnings are slightly higher in 1989 than in 1979, and the proportion of such men in high school jobs declined slightly during the decade.[13]

We cannot interpret the figures for young workers without discussing changes in labor supply. Between 1980 and 1990, the labor supply of young college graduates grew by 60 percent. This represented a slowdown from the 1970's when the baby boomers first arrived in the work force, but it is a much higher growth rate than any we will see in the near future, regardless of how many high school graduates go to college.

The difference is demographics. Between 1979 and 1989, the last baby-boom cohorts were turning age 25. The number of 25–34 year-olds in the population (regardless of education) grew by 19 percent. Between 1991 and 2001, the total number of 25–34 year-olds will decline by 17 percent. Even if young people go to college in record proportions, they will not match the 60-percent increase in the number of young college graduates—an increase that the 1980's economy successfully absorbed.

Of the four groups of graduates, the picture of excess supply only fits older men. Between 1979 and 1989, the real median earnings of older male college graduates fell by 4 percent while the proportion in high school jobs increased from 14.5 percent to 17.9 percent. While these results point to recent white-collar restructuring, the actual picture is more complicated. Synthetic cohort analysis, not reported here, shows that 17 percent of the group that was aged 45–54 in

Table 2. Comparison of median annual earnings of college graduates who worked in 1979 and 1989

[1990 dollars]

Cohort	1979	1989	Percent change
Young women			
Median earnings	$17,961	$22,011	22.5
Percent in jobs requiring high school education	28.2	25.2	[1]–3.0
Adjusted percent in jobs requiring a high school education	28.2	27.4	–0.8
Young men			
Median earnings	$28,981	$29,841	3.0
Percent in jobs requiring high school education	25.0	23.2	[1]–1.8
Adjusted percent in jobs requiring a high school education	25.0	25.1	0.1
Older women			
Median earnings	$19,561	$24,107	23,2
Percent in jobs requiring high school education	27.6	23.6	[1]–4.0
Adjusted percent in jobs requiring a high school education	27.6	25.7	–1.9
Older men			
Median earnings	$48,000	$46,119	–3.9
Percent in jobs requiring high school education	14.5	17.9	[1]3.4
Adjust percent in jobs requiring a high school education	14.5	19.0	4.5

[1] In percentage points.

NOTE: Data are for college graduates who worked at least 1 week during 1979 or 1989.

1990 were in high school jobs in 1980, when the group was aged 35–44. Thus, less than half of the difference between 1980 and 1990 in the percentage of 45- to 54-year-old males in high school jobs stemmed from events that took place during the 1980's.

One other factor which might compromise our interpretation of the data is the change in education coding which occurred between the 1980 and 1990 censuses. We define a college graduate in the 1980 data as someone who has completed exactly 16 years of schooling. The 1990 census does not provide this option. Instead, it explicitly identifies individuals as 4-year degree holders, a somewhat more select group than those who completed 16 years of schooling. We used data from the February 1990 CPS, which contains both education codings, to explore the sensitivity of our estimates to the definition of a college graduate. We used the results of this exploration to calculate "adjusted" percentages of college graduates in high school jobs in 1990, based on the same definition of a college graduate that was used in the 1980 census. (See table 2.) While there is evidence that the change in education coding does affect the estimates somewhat, the overall story remains the same: it is only older male college graduates who fared less well in the labor market of 1990 than did their counterparts in 1980.

In any era, older college graduates are imperfect substitutes for younger ones. In the current era, rapid technological change may diminish substitution possibilities further so that older college graduates would not be qualified for some college-type jobs. For this reason, the most relevant data for current decisions to attend college are the recent labor market experiences of young college graduates. As shown in table 2, figures on median earnings and employment in high school type jobs substantiate that recent job market experience for young college graduates has been reasonably good.[14]

Table 3 emphasizes this point by comparing the earnings and hourly wages of young college graduates with those of young high school graduates. These results, familiar to most readers, illustrate that while earnings of college graduates grew for young men (modestly) and young women (strongly), wages of high school graduates fell for both young women and (more sharply) for men. Relative to a high school diploma, the value of a college degree increased sharply.[15]

Table 3 uses similar data to address a point made by Hecker in a 1995 update to his previous article.[16] As Hecker notes, in 1992, 20 percent of college graduates (all ages and degrees) had earnings below the median earnings of persons with high school diplomas, more evidence, he suggests, of an excess supply of college graduates. For decisions about college, however, what is relevant is not the level of the statistic at a point in time, but the statistic's trend. Table 3 shows that during the 1980's, the proportion of young college graduates with earnings below the high school median was falling for both sexes.

Table 3. Earnings and wages for college graduates and high school graduates and percentage of college graduates with annual earnings below the median high school earnings level, 1979 and 1989

[1990 dollars]

Cohort and labor market measure	1979	1989	Percent change
Median annual earnings and wages:			
Young men			
College graduates:			
Annual earnings	$28,661	$29,348	2.4
Hourly wages	13.95	14.11	1.1
High school graduates:			
Annual earnings	$24,893	$20,685	-16.9
Hourly wages	12.41	10.08	-18.8
Young women			
College graduates:			
Annual earnings	$17,783	$22,011	23.8
Hourly wages	10.84	12.09	11.5
High school graduates:			
Annual earnings	$12,451	$12,578	1.0
Hourly wages	7.70	7.21	-6.4
Percent of college graduates with earnings below the high school median earnings level:			
Men	35.8	25.0	-30.2
Women	33.0	24.9	-24.5

The recent labor market experience of postgraduates (table 4) are consistent with the experience of college graduates (table 2).[17] Over the 1980's, young women and men and older women postgraduates all experienced sharp median earnings gains while older men experienced more modest gains. Similarly, young female, young male, and older female postgraduates experienced moderate declines in the proportion holding high school jobs while the proportion of older male post graduates in high school jobs was essentially stable.

We note one quirk in the data. If the data for college graduates and postgraduates had been combined, it would have shown the proportion of young workers in jobs requiring only a high school education to have *risen* slightly during the decade. This would have resulted despite the fact that both young college graduates and postgraduates were faring better in the 1990 labor market than their counterparts were in 1980. The paradox is explained by composition bias. Between 1980 and 1990, the number of young college graduates increased far more rapidly than the number of young postgraduates. For example, among young men, persons with just a 4-year college degree made up 62 percent of the combined 1980 group and 75 percent of the combined 1990 group. In both 1980 and 1990, young postgraduates have higher median earnings and lower proportions in high school jobs than young

college graduates. The 1990 combined group has lower earnings, other things being equal, because it is made up of a smaller share of postgraduates.

What 'high school jobs' pay college grads

Point III. Recall that growing earnings inequality during the 1980's involved two trends: a widening earnings gap between workers of different educational levels and a growing "within-group" inequality among workers of the same educational level.[18] (See table 5.)

In the case of young men, recall (table 2) that young male college graduates had roughly equal median earnings levels in 1979 and 1989. Growing within-group inequality around a constant average results in lower real earnings for the "worst-off" college graduates and higher real earnings for the "best-off" college graduates.

As shown in table 5, young male college graduates in high school jobs—presumably some of the worst off male college graduates—had median earnings of $23,115 in 1979, while their 1989 counterparts had median earnings of $20,963, a decline of 9.4 percent. The combination of declining earnings among the worst off and a steady median indicates a growing within-group inequality among these young male college graduates.

At the same time, the data show a growing college graduate-high school graduate earnings gap for young men in these high school type jobs. In 1979, young male college graduates in high school jobs were earning 5 percent less than young male high school graduates in the same occupations. In 1989, young male college graduates were earning 8 percent more than young male high school graduates in those jobs. The pattern for older men is similar.

The earnings of young female college graduates exhibit the same pattern in a somewhat different form. For these women, within-group earnings inequality increased because earnings at the bottom of the distribution grew, but earnings in the middle (and top) of the distribution grew faster: median earnings grew by 13.5 percent among young female college graduates in high school jobs (table 5) and by 22.5 percent among all young female college graduates, regardless of job (table 2). As was the case for young men, the earnings gap between young female college graduates and young female high school graduates in jobs requiring a high school education widened over the decade. The data for older female college graduates tell a similar story.

The 1980's were a decade of increasing inequality in which there was a growing earnings gap between workers in the bottom of any group—young high school graduates, older college graduates—and the average worker in that same group. In our case, this means that the earnings gap between the average young college graduate and the young college graduate in a job requiring a high school education grew over the decade. But this is quite different than saying college graduates in jobs requiring a high school education should have not gone to college at all. To the contrary, the 1980's trends indicate a growing differentiation between college graduates and high school graduates *employed in high school type jobs* which suggests that a college degree has growing value even among those graduates who are employed in high school type jobs.

Table 4. Comparison of median annual earnings, for postgraduates, 1979 and 1989

[1990 dollars]

Cohort	1979	1979	Percent change
Young women			
Median earnings	$21,338	$25,757	20.7
Percent in jobs requiring high school education	13.6	11.6	[1]–2.0
Young men			
Median earnings	$29,603	$33,541	13.3
Percent in jobs requiring high school education	25.0	23.2	[1]–1.8
Older women			
Median earnings	$27,479	$31,969	16.35
Percent in jobs requiring high school education	10.4	8.8	[1]–1.6
Older men			
Median earnings	$48,000	$50,312	4.8
Percent in jobs requiring high school education	7.5	7.6	[1]0.1

[1] In percentage points.

Occupational shifts are the key

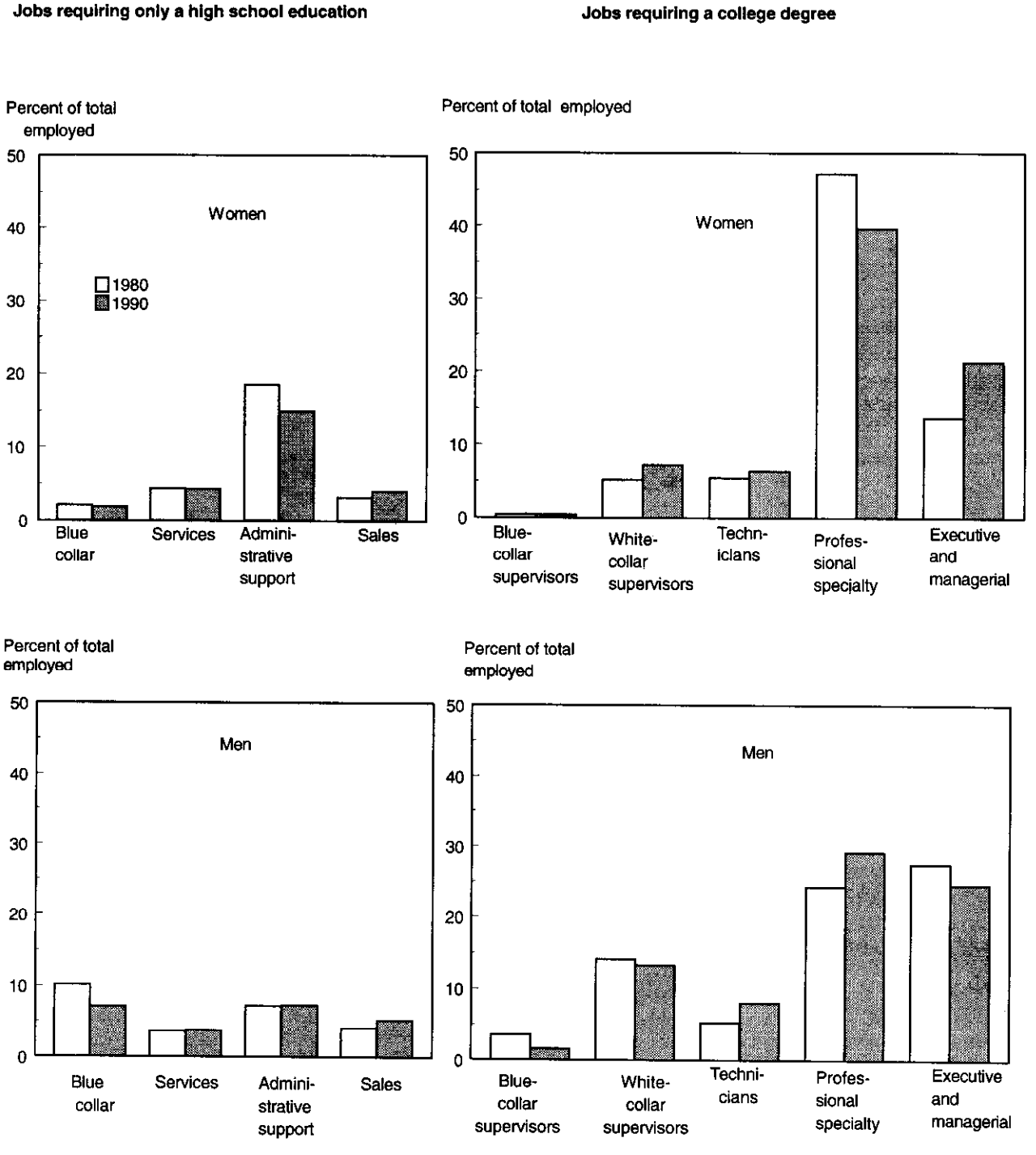
How did young college graduates in the 1980's avoid the fate Hecker's article suggests? Let us look at the occupations they chose.

In both 1980 and 1990, young female college graduates were largely employed in three occupational groups—administrative support, professional specialties, and executive and managerial occupations.[19] (See chart 1.) Over the decade, however, the share of young women in professional specialties declined significantly.

Over the same period, young male college graduates were concentrated in white-collar and supervisory occupations, professional specialties, and executive and managerial positions (chart 1).[20] The share employed in professional specialty occupations increased over the decade.

Professional specialty occupations played a key role in labor market changes for college graduates over the 1980–90 period. (See chart 2.) In both 1980 and 1990, young female college graduates were employed primarily in health occupations and in education. But the 1990 cohort of young women

Chart 1. **Occupational distribution of 25- to 34-year-old college graduates who worked, 1980 and 1990**



displays a striking trend: all of their reduced employment share in professional specialties reflects declining employment levels within education, while their employment shares in all other professional specialty occupations increased or remained steady.

The impact of this shift on the annual earnings of the 1990 young cohort of females is evident. Education, the occupational category with the falling share of young female college graduates, had lower earnings than the engineering, science, and health categories in both years. These three categories with growing shares of young female college graduates had earnings that were high and rising. Put differently, the shift of young female college graduates within professional specialties reflected their responses to occupational opportunities offering higher earnings.

The story is similar for the young men. Young male college graduates in 1990 had higher employment shares in professional specialties than did their counterparts in 1980. Virtually all of this increase occurred in engineering, the sciences, and health. In fact, the 1990 young male cohort had decreased relative shares in education and the social sciences.

The distribution of median earnings by occupation shows the effect of shifts in employment shares on annual earnings of young male college graduates. As with the 1990 cohort of young women, the three categories in which young male college graduates were concentrated in 1990 were the ones which had the highest annual earnings and the most growth over the 1980's—engineering, the sciences, and health occupations. And as with the young female college graduates in 1990, the young men had substantially reduced employment shares in the low paying field of education.

Young male and female college graduates were very responsive to market signals regarding employment and earnings opportunities. Both groups increasingly earned degrees in those occupations which had higher earnings levels at the beginning of the decade *and* which had the greatest earnings growth over the decade: highly technical fields such as engineering, the sciences, and health. Correspondingly, fewer young men and women opted for degrees which led to lower paying careers in education and the social sciences.

What about underemployment?

Every reader of this article will have an anecdote about some new college graduate—a daughter, son, friend— whose first job out of college might be working as a waiter in a cafe latté bar, for example. Anecdotes make strong impressions and even a charitable reader might conclude that we are right about the 1980's, but that the world has changed since then.

A changed world, however, is not the only way to reconcile anecdotes with the data as a closer examination of the age-earnings profile of young college graduates shows. Most anecdotes about college graduates getting started in the labor

Table 5. Median annual earnings of college graduates employed in "high school-type" jobs, 1979 and 1989

Cohort	1979	1989	Percent change
Young men			
Median earnings	$23,115	$20,936	-9.4
College-high school earnings ratio	.95	1.08	13.7
Young women			
Median earnings	$14,228	$16,143	13.5
College-high school earnings ratio	1.18	1.40	18.6

NOTE: Data are for college graduates who worked at least 1 week in 1979 or 1989.

force describe 22- or 23-year-olds. The "young worker" data in table 2 describe the median earnings of 25- to 34-year-olds—roughly speaking, the earnings of a 30-year-old. Anecdotes and data can both be right if young people do a lot of "getting on track" between the ages of 22 and 30.

In 1979 and 1989, 22- and 23-year-old college graduates had quite low earnings in line with the anecdotes. (See chart 3.) But the figures also show that young college graduates make substantial progress during their 20's, so that by the time they are 30, their earnings resemble the data in table 2.[21]

We do not mean to minimize the problem of finding a high paying job, particularly in an economy with significant white-collar restructuring. But we should not let the anecdotes obscure the fact that newly minted college graduates working in latté bars (or in other jobs that do not require a college degree) is nothing new, and that being underemployed at age 22 does not mean being underemployed at age 30.

The bottom line

Daniel Hecker's picture of a growing number of college graduates in high school jobs has become one of those "facts" that everyone knows. The fact has been taken, particularly by the media, as evidence that expanding access to college is no longer a sensible thing to do.

In this article, we have argued that the "fact" was largely an experience of the 1970's. Over the 1980's, by contrast, young male and female college graduates have held their own in a labor market which had to absorb large increases in the number of new college graduates. These facts have been obscured by the way in which college graduates often take 2 or 3 years to get started. Young men with college degrees had slightly higher median earnings in 1989 than in 1979, and young women with college degrees experienced even greater increases in median earnings, as both groups responded to labor market signals pointing to higher paying occupations.

Over the 1980's, the earnings gap between persons with a

Chart 2. **Distribution and median earnings of 25- to 34-year-old college graduates working in professional specialty occupations, 1980 and 1990**

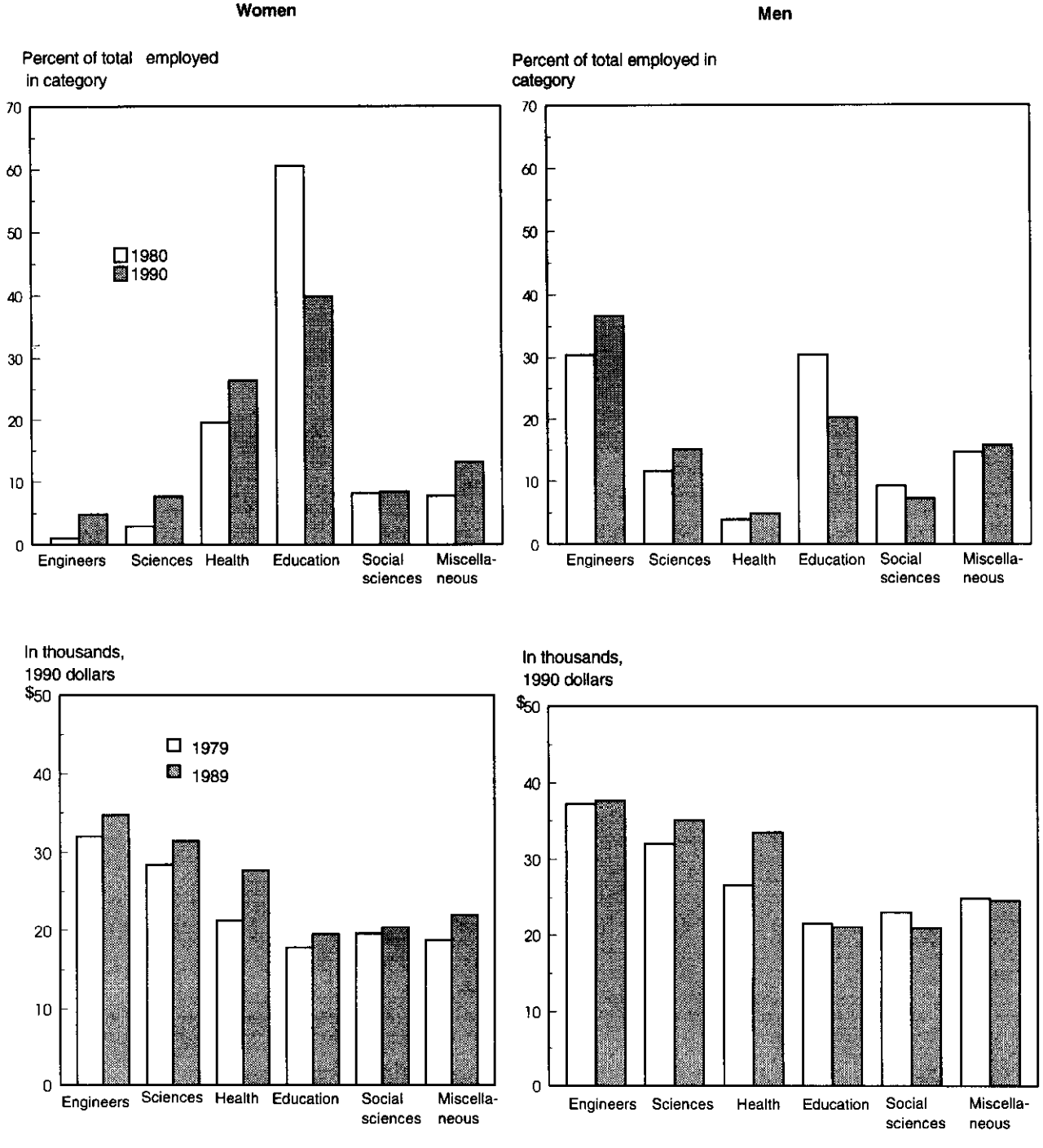
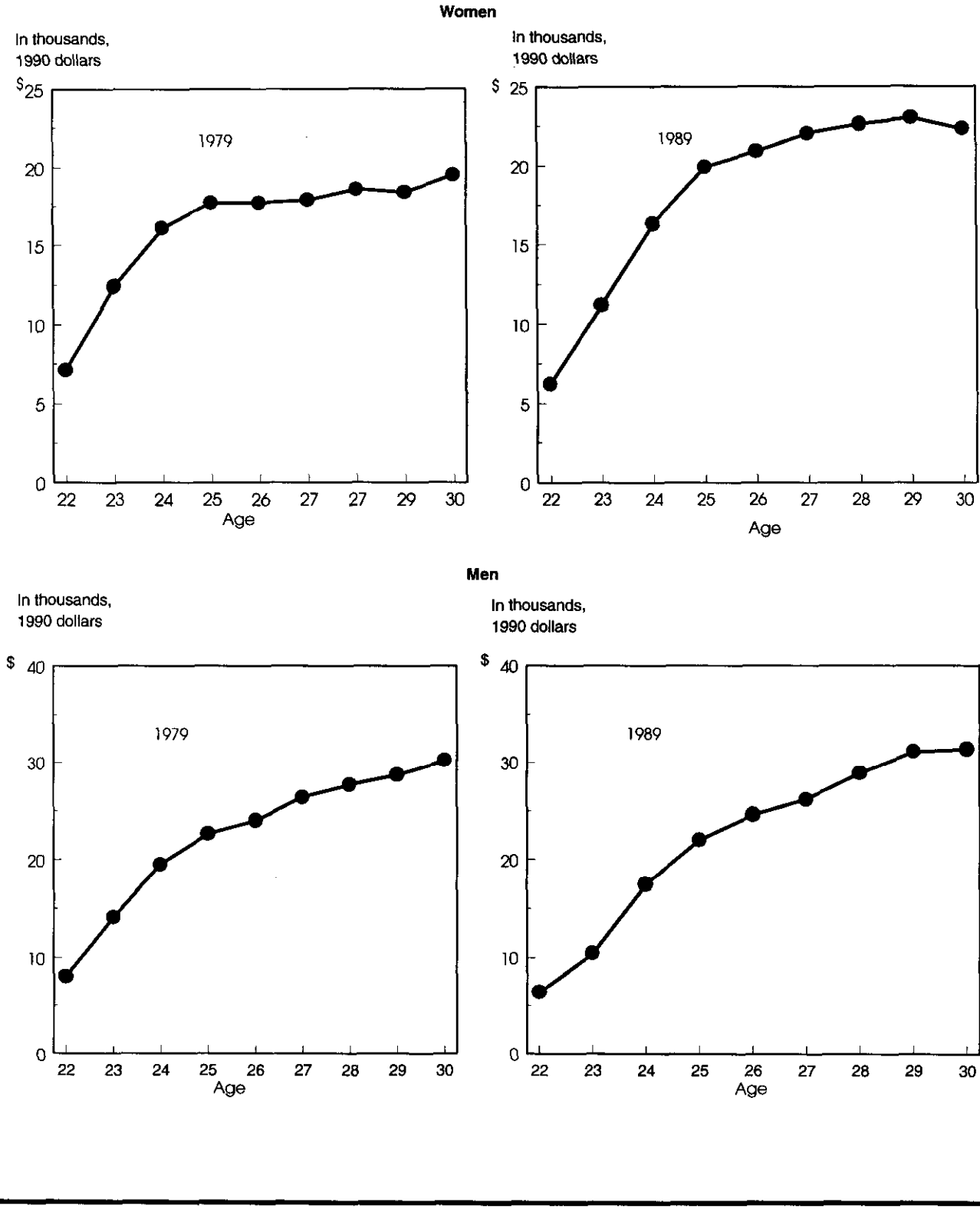


Chart 3. **Median annual earnings of 22- to 30-year-old college graduates who worked, 1979 and 1980**



college diploma relative to those with a high school diploma has widened. This widening earnings gap has been demonstrated by many authors.[22] But as we show in this article, the gap has widened even for young men and women employed in high school jobs.

We do not conclude from this analysis that everyone should go to college. Rather, we conclude that gluts and shortages of college graduates should be determined in the old fashioned way—by looking at prices and quantities. Other kinds of data, such as occupational skill requirements, can tell interesting stories. But when those stories conflict with market data about trends in the relative prices commanded by college graduates and high school graduates and trends in the relative sizes of these groups, it is the market data that we should believe.

The 1990's will certainly find some proportion of college graduates working in high school type jobs—there is always a lower tail to any distribution. We have shown, however, that the labor market of the 1980's successfully absorbed new college graduates, even as the overall college labor supply grew by 60 percent. Thus, the expected slowdown in the 1990's in the number of new college graduates entering the labor market, coupled with even steady demand growth, points to a market which will continue to reward college graduates.

Footnotes

[1] See Richard B. Freeman, *The Overeducated American* (New York, Academic Press, 1976), for the most widely recognized development of this theme.

[2] Daniel E. Hecker, "Reconciling conflicting data on jobs for college graduates," *Monthly Labor Review*, July 1992, pp. 3–12.

[3] Robert J. Samuelson, "The Value of College" *Newsweek*, Aug. 31, 1992, p. 75.

[4] Sylvia Nasar, "More College Graduates Taking Low-Wage Jobs," *The New York Times*, Aug. 7, 1992, p. 5.

[5] Kristina J. Shelley, "More Job Openings—Even More New Entrants: The Outlook for College Graduates, 1992–2005," *Occupational Outlook Quarterly*, Summer 1994, pp. 4–9.

[6] While the media dates white-collar restructuring to the 1989–92 recession, the process actually began in the mid-1980's, propelled by the deregulation of the telephone industry, airlines, and so forth.

[7] We use the term college graduate to refer to a person whose highest educational attainment is a four-year college degree. We use the term postgraduate to refer a person with 5 or more years of college.

[8] Lawrence F. Katz and Kevin M. Murphy, "Changes in Relative Wages, 1963–1987: Supply and Demand Factors," *Quarterly Journal of Economics*, February 1992, pp. 35–78.

[9] See, for example, *Statistical Abstract of the United States: 1991* (U.S. Department of Commerce, 1992), table 634.

[10] Census questions on earnings refer to the year prior to the survey. Thus, earnings and wages in this study are for 1979 and 1989. Occupations, on the other hand, refer to the year of the survey, and hence, occupational figures in this article are for 1980 and 1990.

[11] Between 1980 and 1990, the census changed the precise questions asked about an individual's highest schooling attainment. This change necessitated our using a slightly different definition of a college graduate for the 1990 sample than we used for the 1980 sample. Further in the text, we explain the change and discuss the effect that it had on our findings. In tables in which we compare college graduates with high school graduates, we exclude persons with implicit hourly wages less than one-half of the 1979 minimum wage and persons whose hourly wages are more than $100 per hour. The lower cutoff in the rest of the study is $3 per hour. We also exclude persons working in the military and in mining, forestry, fishing, and agriculture because wages in these industries and in the Armed Forces may understate actual compensation.

[12] Hecker classifies workers as being in college jobs if they are employed in executive, administrative, and managerial occupations, professional specialties occupations, technical occupations, sales representatives, some of those listed as sales supervisors or proprietors, some law enforcement officers, and supervisors in both white- and blue-collar occupations. He classifies the remaining sales occupations and administrative support, service, and blue-collar occupations as high school jobs.

[13] The 20-percent increase in annual earnings experienced by women should not be overstated. As is well known, the 1980's, like much of the 1970's were a period of slow wage growth. Correspondingly, a decomposition using mean changes in women's annual earnings shows that only about one-third of the 1979–89 gains reflect higher wages per se. The remainder of the gains come from increased hours of work (one-half) and the positive interaction between wages and hours (one-sixth). Mean earnings are used in these calculations because median earnings cannot be decomposed in this way. Among young female college graduates in the 1979–89 period, the earnings change was 26.4 percent at the mean and 22.5 percent at the median.

[14] We noticed one puzzle in the data. If CPS data are used instead of data from the Public Use Microdata sample to calculate the changing percentages of college graduates in high school jobs between 1979 and 1989, then the percentage of young male college graduates employed in high school jobs rises slightly (by 3.3 percentage points) instead of declining. However, the CPS data also indicate an even larger increase in the percentage of older male college graduates in high school jobs over the period (by 6.9 percentage points) than does data from the Public Use Microdata sample, so that the story of the relative well being of the two groups over the 1980's remains the same.

[15] Using data from the 1990 and 1994 March Demographic Files of the CPS, we have confirmed that these trends held during the first part of the 1990's. From 1989 to 1993, the median earnings of 25- to 34-year-old male college graduates fell 4.4 percent. However, the median earnings of 25- to 34-year-old male high school graduates fell 13.7 percent and the median earnings of 45- to 54-year-old male college graduates fell 7.5 percent.

[16] Daniel E. Hecker, "Further analyses of the labor market for college graduates," *Monthly Labor Review*, February 1995, pp. 39–41.

[17] See footnote 7. White-collar restructuring actually began in the mid-1980's when the deregulation of the telephone industry, airlines, and so forth, occurred.

[18] In practice, within-group inequality had been growing since the early 1960's. See Frank Levy and Richard J. Murnane, "U.S. Earnings Levels and Earnings Inequality: A Review of Recent Trends and Proposed Explanations," *Journal of Economic Literature*, September 1992, pp. 1333–81, for a summary of explanations of this phenomenon.

[19] Four occupational groups—blue-collar, services, administrative support, and sales—constitute high school-jobs and five occupational groups—blue-collar supervisors, white-collar workers and supervisors, technicians, professional specialties, and executive and managerial occupations—constitute the college graduate-jobs.

[20] Note that the aggregation "white-collar and supervisory occupations" is not a Dictionary of Occupational Title category, but rather, the result of designating occupations as being in the high school-jobs group or the college-jobs group.

[21] In "The Structure of Wages," *Quarterly Journal of Economics*, February 1992, pp. 285–326, Kevin M. Murphy and Finis Welch similarly remark on the steepness of the age-earning profiles for young, well educated workers.

[22] Gary Burtless, ed., *A Future of Lousy Jobs? The Changing Structure of U.S. Wages* (Washington, DC, The Brookings Institution, 1990).