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ABSTRACT

Based on information beginning with the National Longitudinal Study of the High School Class of 1972, this study describes the educational careers and labor market experience of women in the class of 1972 through the time they were 32 years old. Women's academic performance in high school was far stronger than that of men, yet, at the same time, both their educational aspirations and plans were lower than those of men. Nonetheless, they continued their education after high school at the same rate as men, were rewarded more scholarships for postsecondary education, and completed college degrees faster than did men. Women's grade point averages in college were higher than men's no matter what field they studied. As a result of their undergraduate achievements, the educational aspirations of women changed considerably, with dramatic increases aspiring to graduate degree. From age 18 to age 32, the women of the class of 1972 developed more positive attitudes toward education than did men, and came to believe that they truly benefited from schooling. These benefits, however, did not hold up in the labor market, where evidence of women's superior educational performance and commitment was discounted. Between age 25 and 32, for example, a much higher percentage of women than men experienced genuine unemployment, no matter what degree they earned. In only 7 of 33 major occupations did women achieve pay equity with men. Despite the discouraging pattern of earnings differentials, more women than men found their education relevant to their work, and, among bachelor's degree holders, more women than men came to work "a great deal" with ideas, the engine of an information economy. Women also took a more positive attitude than men toward working conditions, relationships on the job, and development of new skills. They were, in short, more enthusiastic and potentially productive workplace participants at the same time they were under-rewarded. The study concludes that both women's knowledge and their willingness to share that knowledge in the workplace is critical to the nation's future, and should be rewarded so that all may benefit. A lengthy list of references and 23 tables of data compiled from the surveys utilized are included at the end of the report. (DB)

Women at Thirtysomething: Paradoxes of Attainment

U.S. Department of Education
Office of Educational Research and Improvement

Women at Thirtysomething: Paradoxes of Attainment

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Within the Office of Educational Research and Improvement, I owe much for the shepherding and publication of this and other studies of the NLS-72 to John Burkett, Cynthia Do fman, and Margaret McNeeley.

And if I didn't live with Nancy Adelman, who provided eloquent testimony, trenchant commentary, and considerable patience, this study might not have been as interesting.

WOMEN at THIRTYSOMETHING:
Paradoxes of Attainment

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Executive Summary

[This study will be a chapter in a collection of studies, *Archives of a Generation*, to be published later in 1991, and thus includes references to other chapters in that volume. *Archives* is based on the National Longitudinal Study of the High School Class of 1972, an extraordinarily rich assembly of data consisting of surveys conducted in 1972, 1973, 1974, 1976, 1979 and 1986, high school records and test scores, and, most importantly, the postsecondary transcripts of those individuals from the high school class of 1972 who attended any kind of postsecondary school or college at any time between 1972 and 1984.]

This study describes the educational careers and labor market experience of women in the high school class of 1972 through the time they were 32 years old. The paradox of this story--that women's educational achievements were superior to those of men, but that their rewards in the labor market were thin by comparison--is set in the context of national economic development.

Women's Educational Attainment

Women's academic performance in high school was far stronger than that of men, and those who studied more than 2 years each of math and science performed just as well as men with the same curricular backgrounds on the SAT. At the same time, both their educational aspirations and plans were lower than those of men. Nonetheless, they continued their education after high school at the same rate as men, were rewarded more with scholarships for postsecondary education, and completed college degrees (both bachelor's and associate's) faster than did men.

Using actual college transcripts, this study tells a more complex story of curricular preference than we have ever heard. Yes, the "women's curriculum" is dominated by human services and humanities courses, the men's by business and core science and engineering courses. But there are different patterns of course-taking *within* fields, and some of the most interesting are in foreign languages, biological sciences, English, and math.

Women's grade point averages in college were higher than men's no matter what field they studied. This pattern held in individual courses, particularly in mathematics, where women earned higher grades than men in both statistics and calculus. As a result of their undergraduate achievements, the educational aspirations of women changed considerably, with dramatic increases in the percentage aspiring to graduate degrees. And a higher percentage of women than men continued their education

after the age of 30, whether or not they had previously earned a degree. Women's curricular preferences changed, however, during this period of their lives, as more of them moved into fields such as accounting and computer science.

From age 18 to age 32, the women of the Class of '72 developed more positive attitudes toward education than did men, and came to believe that they truly benefited from schooling.

Women's Labor Market Experience

These beliefs, however, did not hold up in the labor market, where the evidence of women's superior educational performance and commitment was discounted. Between age 25 and 32, for example, a much higher percentage of women than men experienced genuine unemployment, no matter what degree they had earned.

The analysis of such features of economic life as unemployment, occupation, and earnings in this story compares men to women who did not have children by age 32, as these two groups are more likely to have similar amounts of job experience.

In only 7 of 33 major occupations did women achieve pay equity with men. In five other occupations, four of them in business-related fields, women who took more than 8 credits in college-level mathematics achieved pay equity. Outside of these areas and these conditions, however, the men of the Class of '72 were paid more than the women without children no matter what unit of analysis is applied.

Despite the discouraging pattern of earnings differentials, more women than men found their education relevant to their work, and, among bachelor's degree holders, more women than men came to work "a great deal" with ideas, the engine of an information economy. Women also took a more positive attitude than men toward working conditions, relationships on the job, and development of new skills. They were, in short, more enthusiastic and potentially productive workplace participants at the same time that they were under-rewarded.

Do women value traditional economic rewards? Yes. In fact, they came to value salary in occupational and job selection more than did men. At the same time, however, men's general life values tilted more toward materialism and self-centeredness than did those of women. These differences are confirmed by the patterns of involvement of men and women at age 32 in different kinds of organizations, clubs, and charities.

The study concludes that both women's knowledge and their willingness to share that knowledge in the workplace are critical to the Nation's future, and should be rewarded so that all of us may benefit.

WOMEN at THIRTYSOMETHING:
Paradoxes of Attainment[1]

by Clifford Adelman

I am sure that readers of these pages remember the tone of the newspaper columns at the end of that *annus mirabilis* called 1989. There was a shadow of 2001 over everything. Columnists ranging from Samuelson in *Newsweek* to Abelson in *Barron's* worried then--and worry now--that our work force will be wholly eclipsed by those of other advanced postindustrial nations, that we are unprepared for the upheavals and opportunities of a global economy, and that ultimately our standard of living will fall. Their recitations defined the "going mood," and a year or so later, the going mood has not gone away.

But the going mood overlooks a reality that few have marked: if we play it right, if we allow our oft-stated beliefs in rewards for educational achievement to govern, if economic justice can determine economic strategy, the women of the United States will make the difference. We will not be eclipsed and our standard of living will not fall--if we play it right, and just.

The United States will enter the next century with a remarkable edge over its global competitors. U.S. women, of all races, are the best educated and trained in the world and will constitute 64 percent of the new entrants to the work force over the next 10 years. U.S. women now comprise more than half of enrollees and degree recipients at all levels of higher education except the doctoral (and even there, the gap between men and women should disappear by the end of the decade) and first professional sector.[2] In contrast, women constitute only 45 percent of enrollees in Italy and Great Britain, 42 percent in West Germany and the Netherlands, and 34 percent in Japan.[3] In terms of general access and attainment in higher education, the issue of women's educational equity in the United States is largely passé. That battle has been won, fair and square. Labor market equity, sadly, is another issue.

"Americans are missing something," said Kerstin Keen of Volvo during a break at a conference of the Organization for Economic Cooperation and Development in Washington in June 1989; "you're not utilizing women as well as you have prepared them." Keen, who presented a report on education and training on behalf of the European Round Table, a consortium of 24 major corporations involved in cross-national human resource development, added that "in most of Europe, the problem is precisely the opposite."[4]

The most telling evidence of this unhappy paradox comes from the archive of the National Longitudinal Study of the High School Class of 1972 (NLS-72). There are dozens of stories in these records, but the most stunning is that of the women.

1. Thesis and Approach

The basic thesis of this study is that the women of NLS-72 made a number of investments in their own educational capital that, in many respects, were of higher quality than those made by men and that, according to the rules, should have paid off in their careers. As of age 32, however, those investments had not paid off, suggesting a residual bias in the labor market that undermines national economic well-being. In normative terms, this thesis advances on many others that have explored the social utility of equity (see Harvey and Noble 1985).

As this thesis plays itself out through the story of the NLS-72 women, I hope the reader will recognize that this study is fundamentally different from the mass of status attainment studies that have consumed sociologists for decades as well as from the considerable body of economic literature dealing with "return on investment" in education (see, e.g., Murphy and Welch 1989). It is different from the former because I believe that "occupational status" is not as important a factor in the analysis of educational effects as productivity within an occupation. In this view, first-rate computer programmers who can shorten the time and sharpen the focus of analyses of industrial or health care problems, for example, are more important to our economy and society than third-rate computer programmers--let alone mediocre lawyers. My story is also different from the return-on-investment studies because it pays attention to the precise nature and quality of the human capital investment, not to generalized measures or models.

Although I do not explore all of them, the paths to and through this thesis are made possible by a number of characteristics of the NLS-72 database: its longitudinal nature; its inclusion of the unobtrusive evidence of postsecondary transcripts; its degree of detail on the occupations and industries in which people worked; its degree of detail on family formation and civic participation; and its inclusion of survey information on the emphases of work, job satisfaction, changing educational and occupational aspirations, and attitudes toward money, careers, family, and so on.

My approach to this story and analysis is descriptive, not reductionistic. The methodological tradition that uses various regression analyses to explain the last drops of human behavior does not govern this presentation. If all I offered you at the end of this excursion was an observation such as "the socioeconomic status of unmarried women is more affected by years of schooling than is the case for married women," or "parental socioeconomic status and type of college attended explain 29 percent of the variance in educational attainment between men and women," I would have shortchanged you.

For the sake of history, the categories of analysis in this story are far more discrete than you will find in the typical sociological or economic study of women's attainment. A half-dozen aggregate occupational categories (e.g., "Professional/Technical") are superseded in this study by 43 categories. Five aggregates for college majors (e.g., "Science/Engineering") are supplanted by 14 aggregates. These are the educational and labor market analogues to what historian Fernand Braudel called "daily life." They get us closer to the particular, provide a

richness of description that helps us better understand precisely where and how women succeed, and suggest where the unhappy paradoxes in economic life may lie.

Because this study is about the relationships between education and labor market experience, the story it tells is not intended to be a complete account of the NLS-72 women's development from adolescence through their early thirties. Because the story is focused on a limited cluster of human capital issues, I cannot claim that any one human capital factor--or the entire configuration--has a greater impact than others on women's lives. And I have to resist the temptation to discuss psychological variables, for it is more difficult to trace them in this particular story. More accurately, as my colleagues have demonstrated in the only other major study of college outcomes for men and women using this dataset (Conaty et al. 1989), such unobserved characteristics as motivation, ambition, and effort must be inferred from choices that we can observe, such as college major, grade point average (GPA), and highest degree earned.

2. Women's Academic Experience and Achievement

Let us first look at the NLS-72 women with an emphasis on evidence of their superior academic performance. In the economic terms of this story, academic performance is one of the principal elements of the quality of human capital investment. The first variable is overall high school class rank. No matter how one slices the high school class of 1972, women's mean class rank exceeded that of men by a minimum of 10 points. Here, for example, are the basic demographic slices for all those who continued their education in any way after high school:

Group	Mean high school class rank	
	Men (s.e.)	Women (s.e.)
All	54.6% (.338)	66.0% (.322)
White	55.6 (.363)	67.3 (.349)
Black	44.1 (1.05)	55.5 (.917)
Hispanic	48.4 (1.57)	58.5 (1.61)
Low SES	50.0 (.791)	61.7 (.728)
Medium SES	52.8 (.491)	65.3 (.465)
High SES	58.7 (.572)	69.3 (.565)

SES = Socioeconomic status

NOTE: Standard errors are in parentheses.

Table 1 illuminates this phenomenon from a different angle. Instead of mean class rank, it uses a distribution across quintiles, and it distinguishes between those students we know for certain continued their education after high school and those who did not. No matter what the category of analysis, a much higher percentage of women than men were at the top of their high school graduating classes. Of all students who went on to college, for example, 40 percent of the women--but only 24 percent of the men--ranked in the highest quintile of their respective classes.

Table 1 also slices the student pie in terms of curricular backgrounds, demonstrating that among students who took more than four semesters in one of the three key elective components of a precollegiate curriculum--math, science, and foreign language--women outranked men in the top quintile of all three categories by a minimum of 20 percent. To be sure, fewer women than men took the minimal college preparatory curriculum in math and science (see table 2), so one can always argue that the group is self-selected. Even so, these women beat men on conventionally "male" turf, as have those in more recent cohorts (Hafner 1989).

When one turns to third-party measures of educational performance, and matches women and men who took equal amounts of math, science, or both in high school, the difference in Scholastic Aptitude Test (SAT) and American College Testing Program (ACT) scores was negligible, at least among whites:

Curriculum	All	White	Black	Hispanic	Percentage in group	
					Men	Women
All	-.21	-.19	-.26	-.41	N.A.	N.A.
>4 semesters foreign language	-.19	-.22	+.04	+.27	17.3%	25.8%
>4 semesters math	-.11	-.05	-.30	-.54	59.2	36.7
>4 semesters science	-.12	-.07	-.30	-1.03	44.8	27.2
>4 semesters math and science	-.10	-.02	-.58	-1.07	35.3	18.2

N.A. = Not applicable
- This symbol means the women's score is lower.
+ This symbol means the women's score is higher.

NOTE: The universe consists of all students for whom both SAT/ACT scores and high school records were available. N=9,197. Male/female differential is shown in standard deviation units (SDUs). SDUs are computed as a ratio of the difference in mean scores between any two groups (for example, black men and black women) divided by the square root of the sum of the squares of the standard deviations for those groups. An SDU greater than +/- 1.0 is an enormous difference. An SDU less than +/- .10 is virtually no difference at all. For all examples in this study, ACT scores were converted to the SAT scale.

The first point to make is that the SDU is a far more responsible and accurate way to measure such differences than mean scores. Why? Because the standard deviation takes account of the considerable variation in the backgrounds of the large populations that take de facto national examinations such as the SAT or ACT.[5] Given the more accurate presentation of the SDU, I wish we could do away with mean scores on such indicators as the SAT, but neither the daily papers nor the nightly newscasts could handle the change.

The second point concerns the conventional wisdom that men always test better than women. This is a complex issue with a huge literature (see Diamond and Tittle 1985). The case is not so easy. Using SDUs as our measure we learn that, overall, the women of the NLS-72 who took a college preparatory curriculum that included a solid background in math or science or both did just as well on the SAT as men with the same curricular backgrounds (for similar observations see de Wolf 1981; Pallas and Alexander 1983).

But we also learn that simple comparisons of test scores between men and women are not, in themselves, very revealing. The racial makeup and socioeconomic status (SES) of male and female test takers[6] are more revealing. A higher percentage of NLS-72 women (12.7 percent) than men (10.8 percent) who took either the SAT or ACT came from the lowest SES quartile, and this difference resulted principally from the overrepresentation of women among black SAT test takers. Indeed, as one moves from the lowest to the highest SES quartile, the percentage of women scoring in the higher bands of the SAT scale increases more than is the case for men (see table 3). Even the more sophisticated comparisons between women's and men's performance on the SAT (see Rosser 1989) are not very persuasive because they do not account for these effects.

To be sure, common achievement tests in specific subjects would tell us more about the adequacy of high school preparation than do tests of general learned abilities such as the SAT (Jencks, Crouse, and Mueser 1983). Unfortunately, the NLS-72 archive does not include such tests. But the correlations between the SAT, for example, and College Board Achievement tests are high enough (Gardner 1982) to justify our use of the former.

Moving on to College

In a study of community college students in the NLS-72 (Adelman 1990a), I invested some pages in exploring the distinction between aspirations and plans in the life of a generation, and demonstrated--with reference to the actual educational attainments of the class of 1972--how the latter play out. Educational aspirations tend to be ideal goals; plans tend to be far more realistic and far more indicative of the individual's academic self-confidence. As high school seniors, the NLS-72 women had lower educational aspirations than the men--and their plans were lesser still.[7] The point of raising this issue in this context is that it does not seem to make a difference. As table 4 makes amply clear, women's educational attainments exceeded both their aspirations and plans, something that cannot be said for men. Watch what women do, not what they say.

Part of the difference between the aspirations and plans of young men and women (and it is difficult to determine just what part) may be due to the attitudes of parents (Brook et al. 1974; Sewell, Hauser, and Wolf 1980). The attitudes of parents were reported by NLS-72 students--which is significant in that a child's perception of parents' attitudes is likely to affect his or her actual behavior. Although I am sure parental expectations have changed as a result of both women's educational attainment (see note 2) and the increasing visibility of female leaders in public life, it is rather obvious that, in the eyes of their children, the parents of the class of 1972 had lower educational aspirations for their daughters than for their sons:

Degree or educational level aspired to	For sons		For daughters	
	Father	Mother	Father	Mother
Graduate	16.1%	17.0%	9.5%	9.7%
Bachelor's	42.9	51.6	40.5	39.0
Some postsecondary education	31.2	22.7	36.5	39.0
No postsecondary education	9.8	8.7	13.5	12.3

In their helpful review of the complex literature on this topic, Kaufman and Richardson (1982) point out that the dynamics of relationships between children and parents, particularly in the case of working mothers and their daughters, are very important in determining who aspires to what. These dynamics are beyond the reach of surveys such as NLS-72, but the data provide other frameworks for understanding the apparent sex role stereotyping reflected in the foregoing table.

For example, those students in NLS-72 who did not enter postsecondary education (i.e., those who were not in the NLS-72 Postsecondary Transcript Sample [PETS]) illuminated

these disparities when, in the fall of 1973, they provided reasons for not going on. Only 3 percent cited discouragement by parents or teachers, but women were more likely to refer to family factors (to be sure, including marriage). Overall, the men were more likely to cite personal preferences, self-doubt, excuses, and so on than circumstances that referred in any way to others.[8]

In these observations about aspirations and educational choice, we have the beginning of a secondary theme in this analysis: the women in our story are oriented more toward others--in adolescence, perceived parental attitudes and family considerations seem to be influential--than toward themselves. This theme will emerge again in both subsequent education and workplace experiences.

Men and Women in College and Elsewhere

The women in the class of 1972 entered postsecondary education directly from high school at the same rate as men, but, regardless of SES, were more likely (29.3 percent) than men (26.6 percent) to have won scholarships during the first 2 years following high school graduation. The combination of these two factors--no delay in going to college and scholarship support in the early years of postsecondary education--helps explain why those women who earned bachelor's degrees did so faster than the men: 66.8 percent of the women who earned bachelor's degrees over 12 years did so in the conventional 4 1/2 years. The comparable percentage for men was 54.7 percent.

Although scholarship support is less critical to degree attainment in community colleges, the same pattern holds for those who received associate's degrees: 41.5 percent of the women who earned associate's degrees at any time over 12 years did so within 2 1/2 years of high school graduation. The comparable figure for men was 34.6 percent. These are significant differences. They begin to tell us a story.

To sum that story up to this point, for the participants in NLS-72, women's high school academic performance was far superior to that of men. In terms of national measures of general learned abilities, the impact of women's course of study in high school--particularly in math and science--was equivalent to that of men. At the same time, their educational aspirations were lower than those of men, an attitude influenced, no doubt, by their parents' lower educational aspirations for daughters than for sons. Nonetheless, they continued their education at the same rate as men, were rewarded more with scholarships for postsecondary education, and completed degrees (associate's and bachelor's) at a faster pace than men.

Men and Women of the Curriculum

It will not surprise the reader to discover that there is a men's curriculum and a women's curriculum in college and that the differences are even more pronounced than they were in high school (table 2). What we observe in the statistics on mean credits earned by those in

the nigh school class of 1972 who received B.A.'s at any time through 1984 are unfortunate clichés:

Subject	Mean credits earned by bachelor's degree recipients	
	Women	Men
Statistics	1.00	1.70
Computer science	0.74	2.27
Calculus	3.29	8.01
Foreign language (introductory)	4.16	2.81
Foreign language (advanced)	0.92	0.36
Performing arts	2.54	1.64
Business	5.10	12.95
Education	12.27	3.85

Even when we look at individual courses (and there are 1,037 course categories in our taxonomy), we observe a very convincing empirical confirmation of what some economists would call segmentation.

Table 5 answers the question, Of the total time (measured in credits) spent in college by men and women who earned bachelor's degrees, what percentage was accounted for by different courses? The table illustrates a trichotomous pattern: there are common courses in which women and men spend roughly equivalent amounts of time (e.g., General Biology), another group in which women spend considerably more time than men (e.g., Developmental Psychology), and a third group in which men spend considerably more time than women (e.g., Business Law). The "women's curriculum" is dominated by human services and humanities courses, the men's by business and core science and engineering courses. Given the fields in which men and women majored in college (see table 6), these distributions--measured in temporal units--are wholly expected.

These patterns do not change significantly when we expand the universe beyond those who earned bachelor's degrees to all students who earned more than 10 credits. Table 7 takes this universe, condenses the 1,037 course categories to 103, and asks what percentage of men and women took courses in those categories (only categories in which at least 20 percent of men or 20 percent of women took a course are used). Again, there are no surprises. For the NLS/PETS sample, General Psychology was a women's course and Introductory Economics was a men's course. Accounting was dominated by men, and education courses

for subject certification (e.g., Reading and Language Arts, Social Studies Education) by women. I choose the second set of examples rather purposefully because, as you will see in a moment, the situation changes among those who are in college after age 30.

Men, Women, and Statistics

The study of mathematics has long been regarded as an occupational gatekeeper (Sells 1973). And it has been both well demonstrated and well argued that because women have historically studied mathematics less than men (a pattern resulting from sex role socialization), they are diverted from the paths of curricula that lead to higher paying jobs in technical and professional fields (Fox and Hesse-Biber 1984). What has not been examined in such studies, though, are the mathematics backgrounds of men and women in the same occupations. In anticipating that discussion below, I want to lay out aspects of the data that are inaccessible without a transcript sample such as the NLS/PETS.

We have already seen that women who studied as much math as men in high school performed just as well on measures of general learned abilities such as the SAT. A similar observation can be made of the college cohort in NLS-72, with one significant qualification: men and women study different types of mathematics in college (for a confirmatory study at one institution see Whiteley and Fenske 1990). We can best observe these differences with reference to the field of statistics.

Our course-coding scheme allotted seven distinct classifications for the study of statistics in higher education, reflecting the fact that statistics is often presented in college as an applied field. The percentages of men and women who studied statistics in these various disciplinary contexts were as follows:

Type of statistics	Men		Women		Percent of majors who were women
	Bachelor's	All	Bachelor's	All	
Math statistics	26.6%	16.4%	19.1%	10.9%	41.1%
Economic statistics	3.5	2.0	1.0	0.5	22.9
Business statistics	10.0	3.6	6.2	2.3	25.4
Biostatistics and biometrics	1.2	0.6	1.1	0.5	35.1
Psychological statistics	3.2	1.8	3.3	1.9	50.9
Social statistics	1.3	0.8	1.7	0.8	*42.5
Educational statistics	0.1	0.1	0.8	0.4	72.6

*All social sciences other than psychology and economics.

These are not mutually exclusive groupings. People who take a statistics course in math may also take a biostatistics or econometrics course. The fields in which women are as likely as men to learn statistics--those in the biological and social sciences--are not surprising; nor are those in which women are far less likely than men to learn statistics--economics and business--surprising. They are byproducts of student majors and the normal requirements of those majors. Economic Statistics is a requirement for economics majors, of whom 77 percent were men. Educational Statistics is not normally a requirement for education majors, of whom 73 percent were women.

With the exception of remedial math (taken after high school in equal percentages by men and women), special math courses for prospective elementary school teachers (e.g., Number Systems), and precollegiate business math, more men than women study math in college no matter what kind of math is at issue. But in the case of statistics, the ratio of women to men is higher than for any other kind of college-level math. Among bachelor's degree holders, 72 women for every 100 men studied statistics in one form or another, whereas, for example, only 43 women for every 100 men studied calculus. The point is that for women who study college-level mathematics after high school, statistics is a more important path than it is for men.

Within-Field Differences

For all the familiar expectations concerning what men and women study in college, there are some fascinating patterns that defy superficial explanation. Three cases of particular interest are presented next in enrollment participation percentages (i.e., the unit of analysis is students, not credits).

The first case is foreign languages. Women in the NLS/PETS dominated study in one group of languages I call "analytic," that is, languages easily recognizable to native speakers of English by the sequential subject-verb-object structure of most sentences. Men held a lesser edge in studying another group of languages I call "synthetic." To a native speaker of English, the sentence order of these languages often involves a delayed element of meaning. It is also true that languages in the synthetic group are more highly inflected than those in the analytic group. That is--to put it too simply--they have many more phonetic elements that determine the status of words and meaning (e.g., suffixes that indicate case, gender, mood, and tense).

Language	Percentage completing at least one language course			
	Men		Women	
	Bachelor's	All	Bachelor's	All
Synthetic group				
German (introductory and intermediate)	9.4%	5.9%	8.7%	5.0%
German (advanced, literature)	1.6	0.9	2.0	1.0
Russian (introductory and intermediate)	0.9	0.7	1.0	0.6
Russian (advanced, literature)	0.3	0.2	0.5	0.3
Latin	1.3	0.8	1.3	0.7
Analytic group				
French (introductory and intermediate)	9.3	5.7	18.9	11.4
French (advanced, literature)	1.6	0.8	4.5	2.2
Spanish (introductory and intermediate)	15.4	10.2	20.8	14.3
Spanish (advanced, literature)	1.7	1.0	4.0	2.3
Chinese (introductory and intermediate)	0.3	0.2	0.7	0.3

It may be that a higher proportion of men took German or Russian because they were majoring in scientific or engineering fields, though I doubt it. But it is also obvious that women who took German and Russian were more likely to study them at advanced levels. This was a consistent feature of foreign language study in NLS-72: women persisted to advanced course levels, hence the likelihood of proficiency. Men did not. And proficiency is the measure of quality in foreign language study.

Do these data imply that women prefer to follow familiar logical sequences (English syntax resembles that of French and Chinese far more than it does German and Latin) and that men prefer "meaning games" with delayed completion of the sense of sentences? Because more women than men study foreign languages at any level, the weight of the hypotheses embedded in these questions is not great. But the course-taking patterns are noticeable nonetheless.

Second, there also appear to be two biological sciences curricula, but neat theoretical explanations for the observed differences in course completions are hard to come by:

Courses	Percentage completing selected courses in biological sciences			
	Men		Women	
	Bachelor's	All	Bachelor's	All
"Men's courses"				
Biochemistry	7.9%	4.2%	6.5%	3.5%
Botany (general)	9.8	6.7	7.9	5.0
Cellular Biology	5.2	2.8	3.7	2.0
Ecology	11.2	6.7	7.5	4.0
Genetics	11.8	6.4	9.2	4.7
"Women's courses"				
Microbiology	9.1	5.6	13.1	10.7
Physiology	9.1	5.6	11.6	6.6
Bacteriology	2.0	1.0	2.6	1.6
Pharmacology	1.5	0.9	2.8	2.6
Ethology	1.7	0.8	1.9	0.9

Both lists, I think, are driven by the practical demands of student major and career goals. The men's list is influenced, in part (Biochemistry, Genetics), by the premedical curriculum and the women's, in part, by the nursing curriculum (the mid- and late 1970s was a period of significant public financial support for nursing programs). Other analytic frameworks involving women's more intimate and "connected" ways of approaching scientific knowledge (Keller 1985) do not offer much help in explaining course taking (though they do provide insights into the ways women and men learn). The research tradition that distinguishes between the descriptive and the empirical modes of thought may be more accurate in its analysis of women who pursue scientific careers (Bar-Haim and Wilkes 1989), but it does not wholly illuminate the course-taking patterns of the masses.

In the English curriculum, the most telling cultural comparison is between Science Fiction (dominated by men) and Folklore and Mythology (dominated by women). This dichotomy is reinforced by a similar pattern involving Technical Wri (men) and Creative Writing

(women). These courses are electives, and student choices express proclivities. Do they imply that men are, in fact, more analytic than women? Not really, for the ratio of women to men in all linguistics courses is 3:1, and linguistics is a highly analytic field. What student choice suggests instead is that men are consistently drawn to technological phenomena or technological representations of phenomena. Indeed, for example, women dominate all fine arts courses except those in film studies, including photography, cinematography, and video (the most technologically oriented of the fine arts). I would not question the proposition that these patterns are legacies of previous sex stereotyping in both formal schooling and informal learning.

The point of these examples is that the curricular paths pursued by men and women in college are distinct, but in more subtle ways than traditional gross categories have revealed.

College Performance and Degree Attainment

The curricular experience of college is but part of this story. More important are the near-term outcomes of that experience. I have already noted that women who earn a B.A. do so faster than men, even though, in this generation, a lower percentage earned the degree. Part of the explanation for the comparative speed at which women earn B.A.'s may lie in a combination of the type of institution from which they received the degree and their major.

Type of institution awarding bachelor's degree	Percent	
	Men	Women
Doctor's degree-granting	43.4% (.462)	37.3% (.476)
Comprehensive college	42.9 (.484)	50.1 (.532)
Liberal arts college	8.9 (.243)	9.9 (.247)
Specialized, other	4.8 (.169)	2.7 (.149)

NOTE: Standard errors are in parentheses.

Recall (from table 6) that a very low percentage of women majored in fields such as engineering and architecture, in which extended programs (an ideal of more than 4 years) are the norm. These programs are far more likely to be offered at doctoral degree-granting institutions and specialized schools of technology than any other. Comprehensive colleges are the home of the vast majority of business and education majors, neither of which, in the 1970s, was an extended program. Liberal arts colleges rarely offer extended programs in professional or occupational fields, and, in general, students attending liberal arts colleges tend to complete bachelor's degrees faster than students who receive their degrees from other types of institutions. Some 60 percent of the women--versus 51.8 percent of the men--

received their bachelor's degrees from institutions whose major academic programs were geared to the traditional 4-year timeframe.

The NLS/PETS database is not the first longitudinal study to demonstrate that women earn consistently higher GPA's in college than men (see, e.g., A. Astin 1977), but the basis of the data in transcripts allows us to see that this pattern holds no matter what field they studied:

Major	Comparative mean undergraduate GPAs for bachelor's degree recipients	
	Women	Men
All	3.07 (.44)	2.92 (.46)
Engineering and computer science	3.17 (.34)	2.96 (.49)
Science and math	3.18 (.45)	2.98 (.49)
Business	2.96 (.47)	2.79 (.44)
Education	3.05 (.41)	2.89 (.39)
Humanities	3.16 (.45)	3.10 (.50)
Arts	3.13 (.42)	3.08 (.41)
Social sciences	3.08 (.46)	2.95 (.48)

NOTE: Standard deviations are in parentheses.

The differences in performance are greatest if we compare women and men who majored in engineering, science, and business (traditionally "male" fields). To be sure, there is a greater degree of self-selection going on among women who major in those fields, but the NLS-72 data suggest that, with the exception of business, the same can be said for men.

If we use the course, rather than the major, as the arena of academic performance, the same pattern holds. For a noted example, let us use both statistics and calculus, remembering that the ratio of women to men completing courses is much higher for statistics than for calculus, and that the grades come from actual transcripts. Even though it has been well demonstrated that men are more confident than women in their abilities to learn math (Fennema 1984), women do better:

Grades in key mathematics courses	All earning >10 credits		All bachelor's degree recipients	
	Men	Women	Men	Women
Statistics				
A or A-	26.2%	33.5%	28.8%	35.2%
B or B-	35.0	26.2	35.8	35.8
C or C-	30.1	24.2	27.9	23.9
D or F	8.7	6.2	7.5	5.1
Calculus				
A or A-	21.1	31.8	23.6	36.3
B or B-	35.8	31.0	37.5	32.0
C or C-	35.9	28.9	33.0	26.5
D or F	8.2	8.3	5.9	5.1

The experience of this kind of achievement in college had a striking impact on the further educational plans of women in the class of 1972, and unlike the generation immediately preceding them (Coates and Southern 1972; A. Astin 1977). When they were surveyed in 1976, the proportion of those who aspired to graduate degrees vaulted over that of men and remained higher through the 1979 survey:

Aspirations	Women	Men
Aspired to graduate degree in 1972	37.5%	45.7%
Earned B.A. and aspired to graduate degree in 1976	60.5	55.4
Earned B.A. and aspired to graduate degree in 1979	63.3	59.8

Those women who actually followed through on the first step and entered graduate school appear to be more qualified than the men. Using GPA as a proxy for such qualifications, 43.6 percent of the NLS-72 women who entered graduate or professional school had earned undergraduate grades of A- or better. The comparable figure for men was 34.5 percent. Focusing on those who attended 2-year or 4-year colleges or both as undergraduates,

universe 4 in table 8 indicates a smaller proportion of women than men who earned at least 10 credits after the bachelor's degree, and a lower percentage who completed doctor's and first professional degrees before age 30 (the outer limit documented on the college transcripts). But given both the undergraduate achievement of these women and their shifting aspirations, I suspect that if we returned to them at age 40, we would find parity in graduate degrees, though it would differ by field (see Berg and Ferber 1983).[9]

Women and Men in School at Thirtysomething

The NLS-72 PETS provides unobtrusive evidence of the education of this generation through age 30. But the Fifth Followup of 1986 adds 2 years to this history through survey data. By confining the universe of analysis to people who both were in the PETS *and* continued their education beyond the collection of the transcripts in 1984, we have a more reliable portrait of women and men in school in their early thirties because we know their prior educational histories for certain. Of the 12,841 respondents in the Fifth Followup, 8,205 were in the PETS. Of the 8,205, 21.4 percent reported being formally enrolled in school at some time between the fall of 1984 and the summer of 1986.

Who were these people? What and where were they studying? Tables 9 and 10 present the basic data. I see the highlights as follows:

- A higher percentage of the NLS/PETS women (22.9 percent) than men (19.9 percent) continued their education between ages 30 and 32 (table 9).

- Although a higher percentage of women (49.3 percent) than men (45.3 percent) in this group had never earned any degree previously, a lower percentage of women (48.6 percent) than men (52.1 percent) were seeking a degree at the bachelor's level or above.

- Women were more likely to continue their education in community colleges and traditional 4-year colleges and universities than men and less likely to continue in vocational schools or independent graduate and professional schools (table 9).

- The curricular preferences of women and men that we observed in the PETS data changed in four notable fields among this group: (1) accounting and (2) computer science and technology, where women moved into the majority, and (3) fine and performing arts and (4) education courses for subject certification, where men moved into the majority (table 10).

- At every level of credential through the master's degree, a percentage of women equal to or higher than men said they completed the requirements for the credential during this period. This pattern did not hold at the doctor's and first professional degree levels (table 9).

With respect to the last observation, differentials in completion of degree and credential requirements do not appear to be related to full-time versus part-time status. Here is another instance in which actual transcripts would help us decipher what is going on. Knowing how many credits are being earned by students in any part-time semester is key to the analysis of persistence (Knepper 1989).

Degree objective	Part-time status of PETS students in school, 1984-86	
	Men	Women
None	93.1%	93.6%
Certificate or license	70.0	77.6
Associate's	79.8	80.5
Bachelor's	56.5	65.4
Master's	66.5	76.3
Doctor's	33.2	23.4
First professional	83.7	80.4

As for women's move into the fields of accounting and computer science, it is not wholly glib to attribute the trend to labor market demand. Women, as we shall see, come to value earnings in career selection more than men do, and in time, more of them seek the knowledge that will allow entry into higher paying occupations. Given the fact of weaker mathematics backgrounds, the efforts women make in these fields are notable. To be sure, the "computer" field includes data processing, but only 9 percent of the NLS/PETS students who studied computer-related topics between 1984 and 1986 took data processing; the vast majority studied general computer science and computer programming.

Summing Up: Women and Educational Capital

In all these data on background and attainment, women's aspirations are less inflated than men's, their plans more realistic, their focus on goals more intense. They are not full of self-confidence, whether in their ability to learn math or the likelihood that they will earn a doctorate. Unlike men, women do not strut. Instead, they do what they say they will do. In fact, they do more than they say they will do. They act because they discover "personal authority," Mary Belenky and her colleagues wrote in *Women's Ways of Knowing* (1986). To varying extents, they transcend the expectations of parents and communities and develop their own destiny in ways that men do not. Further education is the fulcrum of this

development, and further education and training--along with realistic plans and determination--are the basic currency of the world economy of the 21st century.

Women not only seek further education but develop more positive attitudes toward it than men do. The post-high school NLS surveys all asked respondents to indicate their degree of satisfaction with various aspects of their postsecondary education. Confining its population to those students in the PETS sample, table 11 presents the results at two points in time: age 25 (1979) for all those who had attended up to that point, and age 32 (1986) for all those who had attended any postsecondary institution between ages 25 and 32.

What should be instantly apparent is that a higher percentage of women than men are "very satisfied" with every major aspect of their postsecondary education. But it should also be apparent that the "percentage very satisfied" spread between men and women is greatest with reference to "skill development" and "intellectual growth" (i.e., with reference to self). The women of the NLS-72--more than the men--believed that they benefited from higher education.

3. The Anvil of the Labor Market

Women's beliefs in the benefits of education, however, were not supported by the labor market, where all evidence of women's superior educational performance and commitment was discounted. Between ages 25 and 32, a substantially higher percentage of women than men from the class of 1972 experienced genuine unemployment (i.e., they were in the labor force and looking for work but not working), and this phenomenon held stubbornly in the face of educational attainment. As table 12 demonstrates, the lowest rates of unemployment for women to age 32 were for those who had no children and had earned a credential less than the bachelor's degree by age 30. Of these women, 24.7 percent were nurses and health technicians and another 18.2 percent were in business and financial service support occupations (e.g., secretary and bank teller, both historically low-paying fields). Although their rates of unemployment were comparatively low, they were still higher than men's. This general, sad relationship is not unique to the generation of the NLS-72 (Harvey and Noble 1985).

Women who received bachelor's degrees not only experienced higher rates of unemployment than those with lesser credentials but, as table 13 indicates, were also found disproportionately in lower paying and traditionally female occupations, such as nursing and health technology (11 percent), teaching school (22 percent), and office and financial services support (9 percent). We can infer that this distribution of women in the labor market would hold regardless of the selectivity of the colleges they attended. Indeed, using the same dataset, Conaty et al. (1989) demonstrated that college selectivity is negatively correlated with women's earnings at age 32.

Given women's experience, the "screening hypothesis"--that is, the proposition that educational attainment sorts people with lesser credentials out of high-paying occupations

(Taubman and Wales 1975)--seems to cut both ways in terms of economic benefits to individuals. Education screens in as well as out, and the occupations into which it screens--from schoolteacher to physician--have widely different wage rates. For this reason I have some difficulty with the theory of dual labor markets (Piore 1975), which lumps all professional and technical workers and all managers and administrators together. Had I followed this classification scheme in the analysis of occupational outcomes and earnings, railroad conductors would have been in the same class with chief executive officers[10] and real differences between men's and women's occupations and earnings would be masked.

The Shame of Earnings Differentials

The subject of differences in earnings between men and women is hardly new in either the scholarly or the op-ed page literature. But the NLS-72 archive offers a unique prism for analysis and suggests paths through the topic that, to the best of my knowledge, have not been adequately explored.

The longitudinal nature of the NLS-72 data allows us to make comparisons only among groups of people in the same cohort with similar labor market histories. Thus, all the comparisons I use here are based on people who (1) indicated an occupation for 1985, (2) provided data on earnings for 1985, (3) indicated that they had held at least one full-time job at any time between September 1979 and February 1986, and (4) provided basic histories (every month employed, hours worked, etc.) for as many as four jobs held between September 1979 and February 1986. The purpose of setting those conditions was to ensure that earnings and experience comparisons were based on people who were consistent labor market participants.

Of the 12,841 people in the 1986 followup survey, 8,696 met all these conditions. Of that group, 5,864 were also in the PETS sample. I focus principally on the smaller group because the postsecondary transcripts allow us to control and analyze this group with unobtrusive measures of educational history and attainment. As I have demonstrated elsewhere (Adelman 1990c), we cannot trust survey data on educational attainment variables.

The archive teaches us that the key factors in interpreting earnings differentials between men and women who continued their education beyond high school include children, years of job experience, the experience of unemployment, occupation, industry, type of employer, highest earned degree, college major (for bachelor's degree holders), and amount of mathematics studied in college. Race appears to be an issue only in combination with highest degree earned. As previously demonstrated with respect to bachelor's degree holders only (Conaty et al. 1989), family background and the characteristics of colleges attended have much less influence on earnings than college academic experiences and labor market history.

A few other longitudinal panel studies have focused on earnings, though not always as the key dependent variable (Sewell and Hauser 1975; Alexander, Eckland, and Griffin 1975; Jencks et al. 1979). A noted example is the work of Suter and Miller (1973), whose female

subjects were drawn from the National Longitudinal Surveys of Labor Market Experience (because the name of these studies is very similar to ours, I refer to them as the "Ohio State Panels," after tneir university home). The Ohio State Panels' subjects do not come from a single cohort such as the high school class of 1972, and they include people who never graduated from high school. In this case, for example, the panel covered women who were between the ages of 30 and 44 in 1967 and followed their career behavior for 5 years.

However different this longitudinal panel from ours, Suter and Miller found some relationships similar to those I report below between years of job experience, educational attainment (using the proxy of years of schooling), and occupation (in very broad categories), on the one hand, and earnings on the other. Using regression analyses, they determined that 38 percent of the earnings differentials between men and women could not be accounted for after adjusting for these factors.

Why Earnings?

The earnings function is an important feature of this analysis because it is traditionally interpreted in the economic literature as a proxy for productivity (technically, "marginal productivity"). The human capital theory (Becker 1975) holds that knowledge commands a premium in the labor market and that people sacrifice current earnings by investing in acquiring knowledge. That acquisition presumably renders them more productive, a factor that--if we are interested in empirical evidence--should be reflected in earnings, the return on investment. Knowledge and skill investments should be even more reflected in earnings, according to the theory, if the goods or services produced are in high demand, restricted supply, or both.

Some sociologists (e.g., Collins 1979) dispute the productivity variable in this theory on the grounds that the very nature of organizations in which people work renders assessment of merit, knowledge, and skill almost impossible. Those who are most productive, this counterpoint asserts, are rarely in command; hence they rarely earn as much as those who exploit the political and social systems of organizations to reach positions of power. Although I will return to this intriguing observation, the reader should note that most of our comparisons are within occupation, not within organization, on the grounds that people's educational and training investments are directed toward occupations, not organizations. In the United States, at least, most young people do not say, "When I grow up, I'm going to work for IBM." Instead they say, "I'm going to be a computer engineer." Furthermore, when one's units of analysis (people) are first sorted by background characteristics (education and occupation), the case is stronger for interpreting earnings in terms of productivity.

Dean (1984) has correctly pointed out that there are "productivity effects" resulting from education, including technological improvements and management efficiency, that "may or may not be fully reflected in the earnings" of those involved. Indeed, the whole notion of productivity effects, to which I will return, takes us beyond the human capital or growth

accounting use of earnings as a proxy. But for the moment, let us follow through the traditional analysis.

Two shortcomings in my use of the earnings variable should be acknowledged. First, the NLS-72 archive provides us with self-reported earnings at a number of points in the history of this cohort, but I used only those for 1985 (principally) and 1984. Hence, my reference point is arithmetic, not geometric: I get a snapshot, not a trajectory, and wage profiles generally show a steep trajectory in the first decade of worklife (Mincer 1989). Second, because of the way the survey questions were asked, we annualized earnings;[11] hence we missed potential analyses by "wage rates" (Heckman 1978). In addition, this analysis does not take account of the varying costs of postsecondary education--both direct costs in different institutions and "opportunity costs" (i.e., the earnings one did not garner because of being in school)--that should be included in a full accounting of the "investment" (Wachtel 1975; James et al. 1989).

Nonetheless, what I hope to demonstrate is that even when one accounts for the obvious, at age 32 the men of the NLS-72 were paid more than the women, a fact that may have little to do with productivity.[12] This relationship held even for the 7 percent in the sample under investigation who worked part-time in 1985. In other words, there is an anomaly in the labor market that is probably the result of residual bias. Why else would employers pay more for the similar labor of one group of people over another when the second group has demonstrated equal or superior qualifications? There are exceptions, and they will be noted.

Economists have explored all kinds of approaches to the nature and locus of what Becker originally (1957) called "the discrimination coefficient," the unexplained difference between men's wages and women's wages when all other factors are held constant. Is the difference that employers believe women evidence higher job turnover rates? Is it that employers do not obtain sufficient information about employees' potential productivity when they are hired, but instead judge them with statistical models of group behavior that may be thoroughly outdated (England 1984)? Is it ingrained in the nature of certain industries and types of firms (Lyle and Ross 1973)? Is it the result of sex typing of jobs and sex segmentation within occupations (Treiman and Hartmann 1981)? What perverse system of occupational classification rates--and hence pays--the keeper of a dog pound higher than a nursery school teacher on the grounds that the latter (presumably a woman) acquires the requisite knowledge and skills merely by virtue of being female (Steinberg 1984)?

Our archive contributes only indirectly to these provocative and instructive inquiries, but it provides strong evidence for a recasting the central observation: it is not merely that women are equally qualified--they are better qualified. And to the extent to which more and more better qualified women enter the work force, their wages should rise relative to those of men (Smith and Ward 1984).

Women With and Without Children

The most important distinction made in this analysis involves dividing women into two groups: those who had children at any time up to age 32 and those who did not. With the exception of divorced, widowed, and separated women, marital status did not make a significant difference for women in terms of years of job experience, number of jobs held, or earnings at age 32. On the other hand, marital status did seem to make a difference for men, principally because more men who remained single to age 32 were in school after the age of 26 than were men who married by age 32. Married men thus had more years of job experience, hence higher earnings (though the difference in mean income is too great to be attributed to school time alone):

Marital status	In school sometime, 1979-84	In school sometime, 1984-86	Mean years of job experience	Mean income in 1985
Single men	27.3%	23.4%	7.44 (.071)	$20,837
Married men	25.0	20.1	8.23 (.030)	$27,003

NOTE: Standard errors are in parentheses.

If we are to compare the earnings of working women with those of working men, we should set the basic parameters of the two groups as analogously as possible. Childbirth and caring for young children are unique features of women's lives that, through age 40, inevitably remove them from the labor force for a period of time (Leibowitz 1975). Women with children thus have fewer years of job experience than both women without children and men; and number of years of job experience is directly related to earnings (Polachek 1984).

Although, as Sewell, Hauser, and Wolf (1980) observe, "there is no self-evident temporal or causal interpretation of the association between marital/child status and *occupation*" (italics mine), there is no doubt that "child status" has a strong impact on earnings differentials. Hanoch (1980) observed not only that the number and age of children are inversely related to a mother's annual hours of work, but also that the higher the level of education, the greater the differential in working time between women with children and those without children. Working time translates directly into earnings.

These basic relationships can be seen in the experience of the class of 1972 over a 9-year period (1976-85) as follows:

Group	Mean years of work experience	Mean earnings in 1985
Men	8.0	$25,022
Women without children	7.8	18,970
Women with children	7.5	15,016

Remember that these data are for the group of NLS-72 people I previously defined as consistent labor market participants. Nonetheless, the reader might ask why the earnings of women with children are so much lower than those of women without children (let alone men) compared with the differences in mean years of work experience. The principal difference lies in occupational distribution and is illustrated in table 13. A higher percentage of women without children were in higher paying occupations (e.g., engineer, architect, lawyer, accountant), and a higher percentage of women with children worked in lower paying fields (e.g., nurse, health technician, teacher). Furthermore, while only 7 percent of the entire group under the microscope here were part-time workers in 1985, 14 percent of the women with children worked part-time.

Earnings, Job Experience, and Occupation

Table 14 looks at mean years of work experience for these three groups in 33 occupations, and table 15 presents the earnings differentials for men and women without children in those same 33 occupations.[13] In seven of 33 occupations, women without children earned more than men at age 32. In three of these, the NLS-72 women had more years of job experience: computer programmer, electrical engineering technician, and buyer or purchasing agent. In the other four, women constituted the majority of the NLS-72 employees: research worker not classified elsewhere, high school teacher, editor or reporter, and computer equipment operator. In three of these cases, however, the earnings advantage for women was slight.

To be sure, "occupation" may not be a very useful category of analysis, because what people call themselves is not always what they actually do. "Work role" or "position" (Collins 1979) is probably more accurate. Principally for that reason, I place less emphasis on "occupational status" than other researchers who use longitudinal panel data (Sewell, Hauser, and Wolf 1980; Smart and Pascarella 1986; Sharp and Weidman 1989).[14] Nor does "occupational status" pay the rent. Nonetheless, despite the messages from the *Glamour* magazines of this world, women seem to achieve pay equity in occupations requiring more substance than fluff.

It also seems that women achieve pay equity in some occupations as a correlate of the amount of mathematics they studied in college. If we take those who earned more than eight credits in college-level mathematics of any kind (e.g., college algebra, analytic geometry, calculus, finite or discrete math, statistics) and match 1985 earnings of men and of women

without children, the occupations in which mathematics course taking seems to make a difference for women are as follows:

Occupation	Male minus female differences in 1985 earnings	
	All	Earned >8 credits in college math
Accountant	-9.1%	-2.6%
Engineer	-5.0	-1.9
Manager, financial institutions	-29.1	+4.5
Manager, wholesale or retail	-49.3	-5.2
Manager, manufacturing	-3.0	+7.0

- This symbol means women's earnings were lower.
+ This symbol means women's earnings were higher.

The general conclusion is that women's study of mathematics makes a significant contribution to their earnings in business-related occupations, even in the case of manager in manufacturing industries, where the pay gap between men and women has historically been small.[15] The reader may recall that I used 43 occupations for these analyses, the last of which was a residual category, "other." The residual category covers dozens of occupations and is populated by a fairly large group. Among this group, women who had no children and took more than eight college-level credits in math earned, on average, 16.5 percent more than men with the same mathematics background. That finding indicates a more generalized effect of mathematics course taking for women. More math means more money--for women, in particular.

If we confine our analysis to those who earned the bachelor's degree, and if we look at men and women with similar undergraduate backgrounds, the basic theme does not change. But contrary to Smart and Pascarella's (1986) analysis of SES (of which income is but one component), the variations become more skittish. Table 16 lays out mean years of employment between 1979 and 1986 and mean 1985 earnings, by 12 aggregate categories of undergraduate major, for men, women without children, and women with children. You will see on the first line of the table that all men and all women with children had exactly the same mean years of job experience (5.63) for the period at issue but that average earnings were 30 percent higher for men than for women without children.[16]

The basic form of this relationship held for majors in the applied social sciences (a category including communications, home economics, public affairs, social work, and library science), the biological sciences, and the social sciences. In other cases (e.g., education, engineering, physical sciences) the difference in years of work experience does not seem to justify the magnitude of the earnings differential. Yet in all three cases in which women without children earned more than men--business, humanities, and fine and performing arts--women had more years of job experience.

To underscore these differences, let us match them against undergraduate performance data but simultaneously see if we can explain them by one of the key variables in women's career and labor market experience--time out for the birth of a child and caring for an infant (we used a mean of 4 months as the demarcation line for this variable). As Nakamura and Nakamura (1989) have demonstrated, this time out also has delayed effects, reducing women's overall labor market participation in the succeeding year (they call this phenomenon the "inertia model"). I have used the log of earnings to rank undergraduate majors by the extent of men's advantage--from least to most. In general, the lower the percentage of women who take time off for childbirth, the lower the earnings differential:

Major	Log of men's earnings advantages	Women's mean GPA advantage	Percentage of women who took leave for childbirth
Arts	.10	.08	8.8%
Business	.11	.12	7.6
Engineering	.13	.16	0.0
Education	.23	.17	17.3
Applied sciences	.28	.04	15.0
Applied social sciences	.33	.17	8.9
Humanities	.36	.05	19.0
Biological sciences	.36	.07	16.3
Physical sciences	.44	.19	17.8
Health professions	.46	.17	19.4
Social sciences	.52	.14	13.1

The case is not perfectly neat (witness the category "applied social sciences," but some of the anomalies can be explained fairly easily (e.g., schoolteachers' schedules allow for maternity leave in a less disruptive manner than other professions do). The higher the percentage of a

group that takes four or more months off, the lower the mean years of job experience for that group, hence the lower the earnings expectation. There is no doubt that maternity leave plays a role in the earnings differential (but the comparative percentage of men and women in each major who had earned graduate degrees, for example, plays no role),[17] though determining how great an influence requires more sophisticated statistical analyses than this story (or my abilities) allow.

On the other hand, there is no pattern of relationship between female-male differences in academic performance (GPA as the indicator) and male-female differences in earnings, a finding that confounds Pascarella and Smart's (1990) conclusions with respect to the Cooperative Institutional Research Project (CIRP) students at age 27, as well as a majority of previous studies on grade-income relationships (Cohen 1984).[18] If GPA is a proxy for effort and persistence, and effort and persistence are characteristics valued by employers, then women's pay should more closely approximate that of men, after adjustments for occupation and career interruption for childbirth.

Earnings and Race

If we look at women's earnings by race, we note what I call a "race premium" in the labor market that is largely a function of degree attainment. As table 17 indicates, whether or not they had children, black and Hispanic women who earned bachelor's degrees had higher earnings than the white women in the NLS-72 at age 32. The table also supplies some fuel for the argument that at levels of education below the bachelor's degree, earnings differentials may be influenced as much (if not more) by years of job experience as by educational attainment. Note that the only category of white women with degrees who earned more at age 32 than both black and Hispanic women consisted of those who had no children and whose highest degree was the associate's. The mean years of job experience for that group was the highest of any of the 18 groups of women represented in table 17.

Between the bachelor's and graduate degree levels, there was a notable "race premium" in the labor market for black men and Hispanic women that was not present for any other race-by-sex group (table 18). Black men who earned a graduate degree of any kind had earnings 31.6 percent higher than black men whose education stopped at the bachelor's level (the comparable premium for white men was 2.1 percent). But the earnings of black women in those two groups evidenced no change whatsoever. This is not wholly a labor supply and demand issue: while black women accounted for 61 percent of black bachelor's degree recipients, black men accounted for 64 percent of black graduate school (including professional school) enrollees. Having persisted and succeeded despite tremendous odds, the black women of the NLS-72 seem to hit a plateau of education and earnings that the black men do not.

Career Paths and Emphases of Work

In this analysis, it also pays to look at some differences in the drama of career development of men and women (table 19). Overall, I submit, there is a greater degree of deflation of men's career expectations than of women's--another evidence of women's realism. If one rates the first four occupational categories (clerical, craftsperson, operative, laborer) as of lower status than the others, then the percentage shift from expectations at age 19 to the reality of those occupations at age 32 is greater for men than for women. Conversely, the ratio of people in business occupations to those who planned business occupations, for example, is greater for women than for men. Career paths are overlooked by the vast literature on status attainment, because it is not concerned with productivity or productivity effects--however measured.

The more critical question is what we can learn from such comparative deflations (educational aspirations to actual degree attainment, occupational aspirations to actual occupation) about the attitudes, behaviors, and knowledge men and women will bring to the economy and the workplace. That is where the rubber hits the road for the Nation. Who do we want setting the tone and conditions of our economy? Those who are knowledgeable, always learning, realistic, determined, motivated, and willing to share, one assumes. These are "productivity effects" that take us beyond the proxy of earnings. They are more difficult to quantify (Haveman and Wolfe 1984) and are best deduced from attitudes and behaviors in both the workplace and private life.

In this light, recent work on women's psychological development may hold economic significance. Those who reach the stage of what Belenky et al. (1986) call "constructed knowledge," who integrate self-knowledge and external "procedural knowledge," who have a high tolerance for ambiguity, who are challenged by complexity, and who learn and work in ways that connect the human environment to the knowledge environment can affect the workplace in powerful ways.

4. Women in the Workplace

Despite the discouraging pattern of earnings differentials, a higher percentage of women than men who attended college (no matter what degree they earned) reported at age 32 that their learning and training were very relevant to their work:

Highest degree earned	Percentage reporting high satisfaction with the opportunity to use their education on the job	
	Men	Women
Doctor's or first professional	52.[illegible]%	62.5%
Master's	29.[illegible]	40.2
Bachelor's	28.[illegible]	28.6
Associate's	21.[illegible]	27.2
None	17.3	22.2

Given the educational achievement of these women, the data suggest that productivity effects for women may be greater than those for men. That is, the chances are that people who use their education in their work are controlling and changing the nature of their work--hence are more efficient--more than people who do not use their education in their work. The NLS-72 archive provides some indirect support for this assertion in its revelation of what people work with on the job--ideas, people, paper, or things. As table 20 demonstrates, more men than women of NLS-72 said they worked a great deal with ideas on the job; more women than men said they worked a great deal with people. But as the level of their education rises, the spread between men and women narrows on both counts. And when we restrict the population to those who earned the B.A. *and* found their education very relevant to their work, the proportion of women who claimed to work "a great deal" with ideas exceeds that of men. We expect higher education to yield a greater orientation toward ideas; and our expectations are fulfilled more for working women than they are for men.

Perceptive employers agree with this analysis. "Women come into the workplace like immigrants," says Harold Tragash, vice president for human resources at Rorer Pharmaceuticals, "determined to succeed on the basis of *what* they know, not who they know." Tragash thus sees women more likely than men to "influence co-workers from a technical knowledge base" (personal communication, November 1989). Yes, the "stock of knowledge" represented by human capital is a source of technological change (Mincer 1989), but not unless it is shared. People who share that capital can change the knowledge content of work. Changing the knowledge content of work is critical to innovation in manufacturing, services, and public administration. Innovations stemming from this supply side of knowledge that women in particular bring to the job can make the difference in our economy in the 21st century. Again, these are productivity effects.

Unfortunately, as Kanter (1977) observed, women with this determination and knowledge are not placed in decisionmaking roles, are shunted out of the communication network, and are "stuck" or "encapsulated" in ways that hinder not only their mobility but also their

effectiveness. Men, on the other hand, seem to thrive by the model of ascription I describe in *Light and Shadows on College Athletes* (Adelman 1990b): their success, advancement, and ultimate economic status were based far more on a social network than on the stuff of learning in higher education. We can infer that their jobs probably involve more of what Collins (1979) calls "political labor" than "productive labor." Indeed, the NLS-72 men as a whole were less likely than women to be satisfied with aspects of their work bearing on productivity and more satisfied with their own opportunities for advancement:

Aspects of job satisfaction	Percentage "very satisfied"	
	Men	Women
Working conditions	20.5%	22.6%
Relationships on job	29.5	33.8
Developing new skills	19.5	22.3
Use of education on job	21.1	24.0
Opportunity for promotion in firm	16.5	13.4
Opportunity for career advancement	20.0	17.0

Although these differences are not large and we should not overinterpret them, they reinforce a pattern of evidence suggesting that women are more enthusiastic and potentially productive workplace participants at the same time they are underrewarded.

Research has demonstrated that women make occupational choices for more complex--and personal--reasons than men do, and those reasons do not always include maximizing "objective" economic self-interest (Treiman and Hartmann 1981; H. Astin 1984). Although the socialization issues surrounding this analysis are well documented, the currently fashionable argument (e.g., Mickelson 1989) is that women will thus continue to perform well in school and college and contribute their knowledge to the workplace irrespective of traditional economic rewards--that is, they do not care as much as men do, because women's very idea of "value" is different.

The data in the NLS-72 archive provide both support for this assumption and evidence against it. There is no doubt that, over time, earnings became more significant in career and job choice for the NLS-72 women than for the men. Table 21 documents this phenomenon in some detail, but an excerpt will help illustrate the point here. Between 1973 and 1986, the percentage of people rating income and salary as more important than all other considerations in selecting a career more than doubled for women while remaining rather flat for men:

Year	Percentage rating earnings more important than other factors in job selection		
	Men	Women without children	Women with children
1973	16.9%	8.2%	9.5%
1986	17.7	18.5	20.6

Over the same period and compared with other life values, however, money in general became more important to men than to women (table 22). The flat rate between age 26 (1979) and age 32 (1986) in the percentage of women rating money as a life value higher than others seems to be a function of family formation. That is, one of the major values that "compete" with money in the ratio that produces these data is "being able to give my children better opportunities" (appendix A); the percentage of women who indicated that this value was "very important" rose considerably during the period between age 26 and 32.

There was also a parallel between the increasing importance of money and what one might call a "self-centeredness" variable, that is, the tendency to value activities and achievements referring principally to oneself (success, having lots of money, leisure time) versus others (children, community, broader social concerns). Table 22 demonstrates that the self-centeredness of both men and women drops considerably between the ages of 19 and 26 and then levels off, but that, on balance, men remain more self-centered than women. Though contradicted in part by Astin and Kent (1983),[19] this observation is supported by the NLS-72 respondents' descriptions of the types of voluntary organizations in which they were "very active" at age 32 (table 23): men are more likely to be active in what I call "personal development" organizations such as sports clubs or hobby groups, and women are more likely to be active in community service organizations. No matter what women may say they value, they still give more of themselves than men.

5. What the NLS-72 Women Teach Us

However intriguing the argument that women will continue to attain and contribute to the workplace irrespective of rewards may be for sociologists, it unwittingly condones labor market exploitation and economic stagnation. Basically it implies, "Women are going to do what they always do, so economic rewards are superfluous, hence, why bother?" From the perspective of national economic development, let alone elementary justice, that argument spells disaster.

Why? First, because it does not encourage anyone's educational achievement. It certainly does not tell men--who have been slacking off in school and college for decades, in part because they believe that to learn is "feminine" (Stockard and Wood 1984)--that genuine knowledge counts. Second, because it does not encourage the sharing of knowledge for the

good of any enterp ·se. If we take women's knowledge contributions for granted or ignore them at the same time we treat men's knowledge as proprietary and rewardable, we have a half-economy. Third, because the rest of the world does not behave that way. Other developed, postindustrial nations may not educate as high a percentage of women beyond high school as we do, but their economies do not leave women as underutilized. And the rest of the world is starting to pass us by.

In light of our story, it may be a coincidence that 1972 saw the passage of Title IX (Women's Educational Equity Act) of the Higher Education Amendments, giving a boost to the subsequent course of women's participation and attainment in postsecondary education. The framers of that legislation were concerned principally with the justice of equal treatment, as they should have been. But our national rhetoric has since come to hold that education is also an economic investment on behalf of the whole society. The history of the high school class of 1972 strongly suggests that women can prove the case. The coming century is theirs to do so; but if the market ensures women's attainments through just rewards, the benefits surely will belong to all of us. That is playing it right--and just.

NOTES

1. An abbreviated version of this study appeared under the title "Putting Women's Education to Work Could Enrich U.S. Economy," in the *Los Angeles Times*, October 28, 1990, section M.

2. To provide a framework for the changes in women's educational attainment since 1971-72, the year our respondents were seniors in high school, and 1986-87, the most recent year for which data are available, consider the following:

Degree	Percentage of degrees awarded to women	
	1971-72	1986-87
Associate's	43.1%	56.2%
Bachelor's	43.6	51.5
Master's	40.6	51.2
First professional	6.2	34.8
Doctor's	15.8	*41.0

*U.S. citizens only (imputed).

Women's share of first professional degrees varies widely by field, as the following table, using 1986-87 data, illustrates.

Some of these "first professional" fields do not require the prior receipt of a bachelor's degree, and in those cases the first professional degree is the equivalent of a bachelor's.

Field	Percent female	Field as percent of first professional degrees
Pharmacy	59.2%	1.2%
Veterinary medicine	48.4	3.1
Law	40.2	51.0
Optometry	35.6	1.5
Medicine	32.4	21.6
Dentistry	24.0	6.7
Theology	20.5	8.9
Other fields	24.8	6.0
All fields	34.8	100.0

Source: *Digest of Education Statistics* (Washington, D.C.: National Center for Education Statistics [NCES], 1989), 221 (table 200), 269 (table 243), and 238 (table 211).

3. These are 1984 data for total enrollment in higher education. At what is known in international data as "degree level 6" (i.e., baccalaureate enrollments) the figures are Italy, 46 percent; United Kingdom, 45 percent; West Germany, 38 percent; Netherlands, 33 percent; and Japan, 24 percent. (Department of Education and Science [United Kingdom], *Statistical Bulletin* #ISSN 0142-5013 [March 1987], table 4.)

4. *Education for European Competence* (Brussels: The European Round Table, February 1989).

5. Assume that two subgroups among Scholastic Aptitude Test (SAT) test takers--and let us call them "men" and "women"--have mean scores of 900 and 910, respectively. Assume that the standard deviation for men is 100. That means that roughly 68 percent of all test scores from this subgroup lie in a band 100 points to each side of the mean score (i.e., from 800 to 1,000). Assume the standard deviation for women is 140, hence covering a range from 770 to 1,050. Are the two groups the same in background and preparation? No! Can we honestly say that women's performance on the SAT was higher? No! It is neither accurate nor fair to compare the performance of people in a group with a wide range of abilities (a large standard deviation) with those in a group with a narrow range of abilities (a small standard deviation) by using mean scores alone. The standard deviation unit (SDU), on the other hand, controls for that difference and renders the comparison fair.

6. The relationship between socioeconomic status (SES) and educational attainment (however one measures it) is a cliché of research. People from households with higher SES tend to follow in their parents' footsteps: they take more college preparatory subjects in high school

and have a higher tendency to go to college and earn degrees. In the process, they are also more likely to take a college admissions test such as the SAT or American College Testing Program (ACT). This phenomenon holds regardless of race, but it appears to be more true for blacks than for Hispanics in NLS-72; the more students from the highest SES quartile taking the SAT or ACT, the smaller the difference in performance between men and women.

Group	SES		
	Lowest quartile	Mid two quartiles	Highest quartiles
All	17.2%	48.9%	34.0%
Did not take SAT or ACT	22.0	52.7	25.3
Took SAT-ACT/no PETS	18.8	49.3	31.9
Took SAT-ACT in PETS	11.3	45.9	42.8
Whites	12.1	50.5	37.5
Did not take SAT or ACT	15.3	56.1	28.6
Took SAT-ACT/no PETS	11.8	51.7	36.5
Took SAT-ACT in PETS	8.4	46.3	45.4
Blacks	54.3	37.5	8.2
Did not take SAT or ACT	60.6	33.1	6.4
Took SAT-ACT/no PETS	53.1	35.6	11.3
Took SAT-ACT in PETS	44.2	44.1	11.7
Hispanics	53.6	35.8	10.6
Did not take SAT or ACT	55.5	35.4	9.2
Took SAT-ACT/no PETS	56.3	43.7	0.0
Took SAT-ACT in PETS	54.2	32.2	13.7

NOTE: "No PETS" means that, to the best of our knowledge, the students did not continue their education after high school." "In PETS" means that we know for certain that these students continued their education after high school.

7. When asked the "highest level" of education they *planned* to attain versus the highest level they "would like to attain," the women in the PETS sample pulled back more than men:

Response	Men	Women
Aspired to bachelor's or higher	87.3%	77.9%
Planned bachelor's or higher	77.5	65.2
Percent reducing aspirations	11.2	16.3

8. In fact, only 7.8 percent of the NLS-72 women who did not continue on to college (v. 12.9 percent of the men) indicated that they did not feel qualified for further education. Such data do not reinforce the contention that women attribute their successes to others and their failures to themselves (Bar-Tal 1978).

9. The indirect evidence comes from the Survey of Earned Doctorates conducted annually by the National Academy of Sciences. In 1986, the mean age at which women earned Ph.D.'s was 35.4, compared with 32.7 for men. The range was 29.1 for female doctorates in chemistry (a field in which women constituted 20.8 percent of the doctorates) to 40.0 for female doctorates in education (a field in which women constituted 54.4 percent of the doctorates). See S. L. Coyle and Y. Bae, *Summary Report 1986: Doctorate Recipients from United States Universities* (Washington, D.C.: National Academy Press, 1987) 50-53.

10. The occupational and industry codes used in virtually all surveys and studies sponsored by the National Center for Education Statistics (NCES) are the same as those developed and used by the Bureau of the Census. Each code consists of three digits. For economy, most studies use only the first digit. The series of three-digit occupational codes beginning with 2, for example (hence covering all categories numbered 200-299), has two sections, entitled "Managers and Administrators, Except Farm" and "Sales Workers." In its three-digit subcategories, this series covers such disparate occupations as bank officers (202), funeral directors (211), construction inspectors (213), postmasters (224), railroad conductors (226), bar managers (230), elementary school principals (240), "managers and administrators, not elsewhere classified" (245--the only category in the entire scheme that accommodates a chief executive officer). advertising agents (260), "hucksters and peddlers" (264), newsboys (266), and stockbrokers (271). The results of using only the first digit are thus bizarre, yet no one ever questions them. We have decades of data built on th garbage dumps of such lack of discrimination.

11. Special thanks to my colleague, Nabeel Alsalam, of NCES, for calculating the log of annual earnings for respondents in the Fifth Followup sur y (1986). As a partial indication of the range of data with which this calculation had to deal, consider that 42 percent of those who provided salary data for their most recent job reported an annual figure, 31 percent reported an hourly rate, 11 percent reported a weekly rate, 11 percent reported a monthly rate, and 3 percent reported a biweekly.

12. Because the last NLS-72 survey was conducted at age 32, I would not yet advance a full analysis of rate of return to education. This is a lifespan issue. Becker (1975) and others have pointed out that, over time, men consistently benefit economically from education more than women. Nakamura and Nakamura (1989) explain that for women the value of education seems to depreciate with age, whereas for men the value of further education seems to be enhanced with age. But the databases used by most economists studying this issue are cross-sectional, not longitudinal.

13. Approximately 400 occupational codes were used in creating the raw data files of the NLS-72 (see note 10). I aggregated these codes into two collections for purposes of analyses in this paper: one has 27 values and the other, 43. The first collection consisted of best-choice clusters based on the occupational codes alone (e.g., "artists, athletes, and entertainers" or "accountants, insurance fields, and stockbrokers") and was applied to the entire universe of 1986 respondents. The second collection used industry codes and references to highest degree earned--in addition to occupation codes--and was applied only to respondents who were also in the PETS. For example, to ensure that the category "professional health practice" included only actual physicians, dentists, veterinarians, and so on I restricted the category to those who held degrees higher than the bachelor's. The problem in a survey, of course, is that there are people who will call themselves physicians who are not, in fact, M.D.'s. That is another argument for using transcripts.

14. Smart and Pascarella use SES in its standard triadic construction: highest earned degree, earnings (by bands), and occupational status. Although this approach is more valid than the use of occupational status only, their cohort was 27 years old at the time of the judgment, and their sample admittedly consisted of people "with somewhat stronger academic backgrounds and achievement orientations at the time of initial college matriculation than the typical respondent" (p. 537). But as Sewell, Hauser, and Wolf (1980) pointed out, women's first jobs (which one is more likely to see at age 27) are of a higher "occupational status" than those of men, and by mid-career (their Wisconsin panel was 36 years old at the time of their study) the occupational status of men's jobs is higher.

15. Previous studies (e.g., Lyle and Ross 1973) have found that the most equitable distribution of men and women across occupations within a firm occurs among firms in heavy industry with significant international markets. To be sure, occupational distribution is not the same variable as earnings. But equitable distribution indicates that a corporation takes a positive and active stance toward women's employment opportunities that, by extension, should be reflected in pay. Thus, even though women constituted only 22.8 percent of those in NLS-72 who became "managers" in manufacturing industries, they were paid better relative to men than women who became managers in finance, communications, or wholesale or retail trade industries.

16. In addition, the year-to-year earnings increases between 1984 and 1985 were higher for male B.A.'s than for female B.A.'s: 7.9 percent versus 4.1 percent. Common sense suggests that undergraduate major is not a significant factor in analyzing such a difference.

Industry, occupation, and employer status (private employer, public employer, self-employed) will be far more significant. And in the case of artists, entertainers, and farmers, for example, net income can change dramatically from year to year.

17. With one exception, a higher percentage of men than women who majored in each of these 11 broad fields also earned graduate degrees. Because graduate degrees are associated with higher earnings, we might expect a linear relationship between the men's earnings advantage and the percentage difference between men and women who earned graduate degrees. Arrayed in the same order as in the text (i.e., that of men's advantages in earnings), the relationships are not linear at all:

Major	Percentage of bachlor's degree recipients earning graduate degrees		
	Men	Women	Difference for women
Arts	8.3%	7.6%	-0.7%
Business	14.4	4.8	-9.6
Engineering	16.5	27.1	+10.6
Education	22.3	20.1	-2.2
Applied sciences	19.5	14.3	-5.2
Applied social sciences	12.3	11.2	-1.1
Humanities	33.5	19.7	-13.8
Biological sciences	33.9	22.3	-11.6
Physical sciences	33.3	27.1	-6.2
Health sciences	11.4	9.5	-1.9
Social sciences	20.1	18.3	-1.8

The one field in which a higher percentage of women than men earn graduate degrees, engineering, is the field with the lowest representation of women. Although the difference is statistically significant, there is no doubt we are observing more highly talented, self-selected women in engineering than in other fields.

18. The case should be transparent here. Why we should have 108 correlational studies, as Cohen reports, is beyond me. As a dependent variable, earnings will be affected by highest degree earned, major field, ascriptive effects of institutional selectivity, years of job

experience, occupation, and geographical location of employer long before undergraduate grades come into the picture. At that point, anything will correlate with anything else (as Cohen puts it, "there were more correlational effects than there were research reports"). If you announced that a typical communications engineer who graduated from Massachusetts Institute of Technology with a 2.5 GPA and had been working for 2 years in Silicon Valley earned 10 percent more than a communications engineer who graduated cum laude from Purdue and had been working for 5 years in Dayton, would any listener be astounded? What is surprising in some studies (e.g., Pascarella and Smart [1990]) is the neglect of years of job experience and the collapsing of all occupational categories into such macro bins as "professional v. nonprofessional."

19. Astin and Kent (1983) provide conflicting evidence of these analyses with a 1980 followup of people who were first-time, full-time college freshmen in 1971. They report that the proportion endorsing altruistic values and life goals as "essential" or "very important" dropped more among women than among men and that the proportion who gave a high rating to "being very well off financially" increased far more dramatically among women than among men. They attribute such changes less to the experience of higher education itself than to a "generational effect."

Although I do not believe that using responses to isolated questions about values is as illuminating as setting up ratios in which choices are weighted against others, we can ask the same questions of the NLS-72 group as Astin and Kent asked of the CIRP sample. The following table represents the percentage of NLS-72 respondents judging two contrasting values to be "very important" at three different points in time over a 13-year period. The altruistic impulse declines more among both men and women who had children by age 32 than among those who did not. On the issue of acquisitiveness, only the pattern for women with children is different. Does anyone in the class want to explain?

Value	Men without children	Men with children	Women without children	Women with children
Correcting inequities in society				
1973	17.9%	14.6%	21.4%	18.5%
1979	12.8	12.8	18.9	12.4
1986	11.2	7.6	13.7	9.3
Having lots of money				
1973	14.8	14.5	8.3	7.7
1979	21.0	18.6	14.7	9.3
1986	20.5	19.0	14.7	10.2

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Table 1.--College participation, by high school class rank and precollegiate curriculum of men and women

Percentile	Entered postsecondary education (55.4 percent)		Did not enter postsecondary education* (44.6 percent)	
	Men	Women	Men	Women
All				
80th-100th	23.7%	40.2%	4.6%	14.2%
65th-79th	16.9	19.6	8.2	15.9
50th-64th	17.7	16.0	13.2	17.9
25th-49th	26.6	16.7	32.9	29.4
1st-24th	15.1	7.5	41.1	22.6
Four semesters' math or more				
80th-100th	33.7	57.1	10.6	28.7
65th-79th	18.6	17.4	12.2	15.5
50th-64th	17.0	12.1	15.9	16.6
25th-49th	21.9	10.1	29.8	23.3
1st-24th	8.8	3.3	31.5	15.9
Four semesters' science or more				
80th-100th	34.2	57.7	11.3	27.6
65th-79th	20.0	17.0	12.4	21.7
50th-64th	17.0	12.5	17.2	16.8
25th-49th	20.9	9.4	28.8	24.3
1st-24th	7.9	3.3	30.4	9.7
Four semesters' foreign language or more				
80th-100th	38.8	58.7	19.0	28.6
65th-79th	18.9	18.6	11.5	21.7
50th-64th	15.1	10.8	19.1	19.6
25th-49th	18.3	9.4	27.0	19.5
1st-24th	8.8	2.5	23.5	10.6

* In the Fourth Followup survey (1979), 17.9 percent of the people in this group claimed to have attended a postsecondary institution and 4.6 percent claimed to have earned a degree of some kind. In the Fifth Followup survey (1986), 36.5 percent of the people in this group claimed to have attended and 6.8 percent claimed to have earned a degree. However reasonabl these figures appear, we were unable to obtain validating transcripts for these people in 1984; hence I do not include them in the postsecondary group.

NOTE: The universe consists of all students in the National Longitudinal Study of 1972 (NLS-72) for whom a high school class rank could be calculated. N=19,838.

SOURCE: U.S. Department of Education, National Center for Education Statistics (NCES), NLS-72 Special Analysis File.

Table 2.--Semesters of high school study in selected subjects

Subject	Semesters					
	0	1-2	3-4	5-6	7-8	9 or more
Math						
Men	12.5%	21.5%	28.9%	29.0%	7.4%	0.7%
Women	16.3	33.3	29.0	18.1	3.2	0.1
Science						
Men	12.4	28.9	31.2	21.2	5.6	0.7
Women	13.4	41.1	29.9	12.8	2.5	0.3
Foreign languages						
Men	51.8	21.6	17.5	7.4	1.2	0.5
Women	45.0	21.9	19.7	10.2	2.4	0.9
Social studies						
Men	6.6	3.6	28.4	43.5	14.3	3.6
Women	6.3	4.8	30.5	43.4	12.7	2.3
Fine and performing arts						
Men	64.7	16.5	8.1	6.1	2.6	2.1
Women	52.6	18.1	11.8	9.7	4.4	3.4
Trade and industrial arts						
Men	60.4	12.7	9.6	7.3	4.7	5.3
Women	94.9	3.0	1.1	0.6	0.2	0.2
Business						
Men	61.5	24.4	8.7	3.2	1.3	0.8
Women	41.9	19.7	12.4	8.3	6 4	11.4

NOTE: The universe consists of all NLS-72 participants. N=22,652. All rows add to 100.

SOURCE: U.S. Department of Education, NCES, NLS-72 Special Analysis File.

Table 3.--Socioeconomic status, sex, and SAT/ACT scores

Quartile	SAT score ranges				
	400-700	701-833	834-975	976-1148	1149 and over
All	13.9% (.181)	19.7% (.187)	26.3% (.226)	25.2% (.218)	14.9% (.168)
Lowest SES quartile					
Men	26.7% (1.13)	23.5% (.792)	22.7% (1.06)	19.1% (.686)	8.0% (.500)
Women	33.3 (.952)	20.1 (.655)	26.3 (.903)	16.0 (.554)	4.3 (.570)
Middle SES quartiles					
Men	14.4 (.340)	20.1 (.394)	28.2 (.545)	24.7 (.413)	12.7 (.314)
Women	17.3 (.408)	23.8 (.420)	27.2 (.419)	22.9 (.462)	8.8 (.266)
Highest SES quartile					
Men	5.2 (.183)	14.9 (.339)	24.1 (.450)	30.5 (.497)	25.4 (.363)
Women	9.5 (.319)	18.6 (.483)	26.5 (.690)	27.3 (.605)	18.1 (.415)

NOTE: The universe consists of all NLS-72 students who took either the SAT or the ACT exam and for whom sufficient data were available to construct a composite socioeconomic status (SES) variable. N=8,019. ACT scores were converted to the SAT scale. All rows add to 100. Standard errors are in parentheses.

SOURCE: U.S. Department of Education, NCES, NLS-72 Special Analysis File.

Table 4.--Aspirations, plans, and degree attainment

Highest degree earned to 1984	Aspired to bachelor's degree (N=9,049)		Planned bachelor's degree (N=7,768)	
	Men	Women	Men	Women
None	41.4%	37.3%	37.1%	32.2%
Certificate or license	1.4	2.7	0.9	1.7
Associate's	6.3	7.6	5.7	6.1
Bachelor's	40.2	43.4	44.1	49.3
Master's	6.6	7.9	7.5	9.2
Doctor's or first professional	4.1	1.1	4.6	1.2
All bachelor's and higher	51.1%	53.2%	56.2%	59.7%

NOTE: The universe consists of all NLS-72 and NLS-72 Postsecondary Transcript Sample (PETS) students who answered questions in the base year survey on educational aspirations and plans. N=11,877.

SOURCE: U.S. Department of Education, NCES, NLS-72 Special Analysis File.

Table 5.--Women's courses and men's courses: percentage of total credits earned by NLS-72 bachelor's degree recipients

Courses	Women	Men
Common courses (spread <30 percent)		
English composition (regular)	2.97%	2.96%
General biology	2.11	1.84
General psychology	2.10	1.72
Introductory sociology	1.50	1.11
Physical education (activities)	1.33	1.50
World and Western civilization	1.18	1.15
Introduction to literature (general)	1.19	0.92
U.S. government	1.02	1.18
Introductory communications	0.90	0.89
U.S. history survey	0.74	0.82
Bible studies	0.58	0.64
"Women's courses" (spread >30 percent)		
Music performance	1 51	1.06
Spanish (elementary and intermediate)	1.30	0.88
Nursing (general)	1.27	0.01
Developmental psychology	1.13	0.46
French (elementary and intermediate)	1.12	0.56
Art history	1.04	0.52
English literature	0.96	0.56
American literature	0.93	0.64
Educational psychology	0.90	0.33
Elementary education	0.85	0.11
Social work (general)	0.57	0.15
Anatomy and physiology	0.54	0.19
"Men's courses" (spread >30 percent)		
Calculus	1.02	2.80
General chemistry	1.49	2.24
General physics	0.78	2.09
Introductory economics	1.13	2.04
Introductory accounting	0.74	1.27

See footnotes at end of table.

Table 5.--Women's courses and men's courses: percentage of total credits earned by NLS-72 bachelor's degree recipients--Continued

Courses	Women	Men
Advanced cost accounting, auditing	0.67%	1.48%
Organic chemistry	0.59	1.09
Business law	0.40	0.88
Introductory management	0.37	0.87
Electrical engineering	<0.01	0.85
Geology (introductory, general)	0.50	0.80
College algebra	0.46	0.72

NOTE: The spread between the percentages of credits earned by the two groups is calculated as follows. For example, general biology: (2.11-1.84)/2.11 = 13 percent.

SOURCE: U.S. Department of Education, NCES, NLS-72 Special Analysis File.

Table 6.--Bachelor's degree majors, 1974-84

Major	All	Men	Women
Business	16.1%	22.7%	8.7%
Engineering and computer science	5.0	8.9	0.5
Physical science and math	4.2	5.6	2.6
Biological sciences	6.4	7.8	4.8
Applied sciences[1]	3.3	4.7	1.8
Technical trade	1.4	2.4	0.2
Social sciences	17.5	19.4	15.0
Education	16.5	8.5	25.5
Applied social science[2]	8.0	6.3	9.9
Vocational services[3]	1.2	0.9	1.5
Health science services	7.7	2.9	13.1
Humanities	6.1	4.1	8.2
Arts	4.6	2.9	6.5
Other	2.2	2.8	1.5

[1] Includes agriculture, natural resources, forestry, architecture, and science technologies.
[2] Includes communications, criminal justice, social work, home economics, and public administration.
[3] Includes business support services, vocational home economics, library science, and recreation.

NOTE: The universe consists of all NLS'PETS students whose records include a transcript for a bachelor's degree. N=4,927.

SOURCE: C. Adelman, *A College Course Map: Taxonomy and Transcript Data*. Washington, D.C.: U.S. Government Printing Office, 1990, p. 251.

Table 7.--Percentage of men and women completing undergraduate courses in selected fields, 1972-84

Course	Men	Women	Percent difference for women
Psychology (general, introductory)	52.1	60.9	+8.8%
Literature and letters	48.9	54.8	+5.9
Sociology (general, introductory)	35.0	43.5	+8.5
Economics (introductory)	40.8	21.5	-19.3
Business administration (all)	40.1	26.2	-13.9
Biological science (general, introductory)	34.3	38.3	+4.0
Introductory collegiate-level math	36.9	24.5	-12.4
U.S. history surveys	34.5	29.4	-5.1
Philosophy (all)	33.8	28.2	-5.6
Precollegiate math	32.9	32.8	-0.1
Chemistry (all)	32.5	25.3	-7.2
Psychology (other than introductory or developmental)	23.6	30.6	+7.0
Biological science (other than introductory or service courses)	25.1	30.3	+5.2
Communications (general, introductory)	29.8	28.9	-0.9
Calculus and advanced math	29.8	11.8	-18.0
Education other than special education or subject certification	15.0	29.5	+14.5
U.S. government	28.9	23.2	-5.7
History other than U.S. surveys or world and Western civilization	28.2	23.7	-4.5
Sociology other than introductory	21.8	28.5	+6.7
Accounting	28.0	19.4	-8.6
Communications other than introductory	27.2	23.7	-3.5
Physics (all)	25.8	9.8	-16.0
Interdisciplinary and liberal studies	23.2	25.2	+2.0
Music other than performance	22.3	25.1	+2.8
Home economics other than vocational	9.3	24.3	+15.0
Political science other than U.S. government	24.2	14.8	-9.4
Education (subject certification courses)	12.0	23.8	+11.8
Developmental psychology	10.2	23.7	+13.5

See footnotes at end of table.

Table 7.--Percentage of men and women completing undergraduate courses in selected fields, 1972-84--Continued

Course	Men	Women	Percent difference for women
World and Western civilization	23.6	20.1	-3.5%
Physical science	22.8	17.7	-5.1
Secretarial and clerical	5.8	21.9	+16.1
Anthropology	17.9	21.0	+3.1
Geography	21.0	17.9	-3.1
Visual arts other than crafts and design	15.8	20.4	+4.6
Economics other than introductory	20.2	8.9	-11.3

NOTE: The universe consists of all NLS/PETS students who completed more than 10 undergraduate credits between 1972 and 1984. N=10,734. For this analysis, the 1,037 course categories in our taxonomy were condensed to 103. I have used the 35 of these 103 in which 20 percent or more of either men or women completed courses.

SOURCE: C. Adelman, *A College Course Map: Taxonomy and Transcript Data*, Washington, D.C.: U.S. Government Printing Office, 1990.

Table 8.--Highest degree earned, 1972-84

Degree	Universe									
	1		2		3		4		5	
	Men	Women	Men	Women	Men	Women	Men	Women	Men	Women
Unknown*	4.3%	6.1%	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
None	64.7	64.6	46.6	46.0	39.9	38.4	39.6	37.6	31.1	29.6
Certificate or license	1.8	2.6	3.7	5.8	3.0	5.8	2.0	3.7	0.6	1.6
Associate's	4.7	5.4	7.9	9.8	9.0	11.4	9.0	11.7	1.5	3.0
Bachelor's	17.6	15.9	29.9	28.6	34.3	33.1	35.3	34.9	47.0	48.4
Bachelor's plus some graduate work	2.1	1.9	3.5	3.4	4.0	3.9	4.2	4.2	5.3	5.6
Master's	3.1	3.1	5.3	5.6	6.1	6.5	6.2	6.9	8.9	10.3
Doctor's or first professional	1.9	0.5	3.2	0.8	3.7	0.9	3.8	1.0	5.7	1.6

N.A. = Not applicable.

* These students indicated in 1979 that they had attended college or other postsecondary school, but we could not obtain validating transcripts for them.

NOTE: The universes are as follows: 1, all high school graduates of base year (N=22,652); 2, all for whom postsecondary transcripts with any nontransfer credits were received (N=12,332); 3, all who earned more than 10 undergraduate credits as documented on transcripts (N=10,734); 4, all who earned more than 10 undergraduate credits and attended 2- or 4-year colleges or both (N=10,364); 5, all who earned more than 10 undergraduate credits and attended 4-year colleges only (N=6,280).

SOURCE: U.S. Department of Education, NCES, NLS-72 Special Analysis File.

Table 9.--After PETS: Men and women in school, 1984-86

Subgroup	Men	Women	All
Enrolled, 1984-86[1]	19.9%	22.9%	21.4%
[As full-time student]	[31.2%]	[24.0%]	[27.6%]
Degree objective, 1984-86			
None	13.6 (N.A.)	21.1 (N.A.)	17.6
Certificate or license	20.3 (56.3)	16.0 (68.4)	18.0
Associate's	14.0 (16.7)	14.0 (17.9)	14.1
Bachelor's	20.0 (28.1)	22.6 (28.0)	21.4
Master's	19.3 (31.8)	16.5 (32.5)	17.8
Doctor's	8.8 (34.4)	4.2 (14.9)	6.3
First professional	4.0 (59.0)	5.3 (46.0)	4.7
Type of institution, 1984-86			
Vocational	11.4	7.2	9.2
Community college	26.5	29.2	27.9
Four-year college or university	48.4	56.3	52.6
Independent graduate or professional[2]	11.5	4.6	7.9
Other	2.3	2.6	2.4
Very satisfied with			
Teachers	34.5	42.0	38.5
Quality of instruction	27.6	36.4	32.3
Curriculum	22.5	30.8	26.9
Skill development	23.9	32.8	28.6
Intellectual growth	36.0	43.9	40.2

N.A. = Not applicable.

[1] The denominator is 8,205, that is, *all* students in the NLS/PETS who participated in the Fifth Followup survey. The percentages, as always, are weighted.
[2] Freestanding institutions.

NOTE: The universe consists of all NLS/PETS students who also participated in the Fifth Followup survey (1986) and who indicated that they had enrolled in some kind of postsecondary school between fall 1984 and summer 1986 (i.e., after the collection of college transcripts for the PETS database). N=1,557. Percentages who said they completed the requirements for the credential to which they aspired are in parentheses.

SOURCE: U.S. Department of Education, NCES, NLS-72 Special Analysis File.

Table 10.--After PETS: what did they study?

Field of study	Men	Women	All
Accounting	1.9%	6.7%	4.4%
Real estate	2.6	1.1	1.8
Marketing and distribution	1.5	1.9	1.7
All other business and management	18.9	12.9	15.7
Public and institutional administration	1.8	1.0	1.3
Subtotal: Business management, and administration	26.7	23.6	24.9
Engineering and architecture	9.4	1.4	5.2
Engineering technologies	5.0	0.4	2.6
Computer science and technology	7.5	8.0	7.8
Physical and biological science or math	4.8	0.8	2.7
Subtotal: Science, math, and technology	26.7	10.6	18.3
Education (subject certification courses)	2.7	1.9	2.3
Education (all other)	9.9	24.0	17.4
Subtotal: Education	12.6	25.9	19.7
Allied health	2.0	3.7	2.9
P[illegible]essional health	2.3	1.4	1.9
Nursing	1.2	7.4	4.5
Subtotal: Health services	5.5	12.5	9.3
Law	2.7	2.4	2.5
Public safety and criminal justice	2.0	0.4	1.2
Theology and divinity	2.2	0.5	1.3
Subtotal: Other human services	12.4	15.8	14.3
Humanities	2.1	1.9	2.0
Psychology	1.7	3.7	2.8
Social science	2.0	1.4	1.7
Fine and performing arts	2.7	2.4	2.5
Subtotal: Human and social sciences	8.5	9.4	9.0
Office and business support	1.9	3.9	3.0
Commercial art and design	---	1.9	1.0
Trades, repair, and production	4.2	1.2	2.6
Other	6.9	7.9	7.5

NOTE: The universe consists of all NLS/PETS students who participated in the Fifth Followup survey (1986) who indicated that they attended a postsecondary institution between 1984 and 1986 (i.e., after the PETS transcripts had been collected) and who provided information on their field of study during that period. N=1,532.

SOURCE: U.S. Department of Education, NCES, NLS-72 Special Analysis File.

Table 11.--Satisfaction with education after high school, 1979 and 1986

Aspect of postsecondary education	Universe					
	1. Very satisfied in 1979			2. Very satisfied in 1986		
	Men	Women	Percent difference	Men	Women	Percent difference
Teachers	32.0%	34.4%	2.4%	34.5%	42.0%	7.5%
Instruction	26.2	28.5	2.3	27.6	36.4	8.8
Curriculum	21.2	25.9	4.7	22.5	30.8	8.3
Skill development	22.1	28.8	6.7	23.9	32.8	8.9
Intellectual growth	28.9	35.7	6.8	36.0	43.9	7.9

NOTE: Universe 1 consists of all NLS/PETS students who were in school before 1980 and who answered questions in 1979 concerning their degree of satisfaction with various aspects of their postsecondary education for their most recent year of schooling. N=5,571. Universe 2 consists of all NLS/PETS students who were in school (no matter when they first entered) after the completion of transcript collection in August 1984 and who answered questions in 1986 concerning their degree of satisfaction with various aspects of their postsecondary education. N=1,712.

SOURCE: U.S. Department of Education, NCES. NLS-72 Special Analysis File.

Table 12.--Women's experience of unemployment, ages 26 to 32

Subgroup	Total unemployment in months, 1979-86					
	None	<6	6-12	13-24	25-36	37 or more
Men	66.3% (.304)	11.9% (.183)	7.9% (.162)	5.5% (.141)	4.8% (.113)	3.5% (.123)
Women without children	54.6 (.721)	16.4 (.443)	10.4 (.345)	8.7 (.280)	4.6 (.252)	5.4 (.310)
Women with children	41.3 (.409)	12.3 (.292)	11.2 (.240)	12.3 (.277)	8.5 (.295)	14.5 (.318)
Women with no degree						
Without children	47.9 (1.20)	16.6 (.848)	12.4 (.762)	10.3 (.409)	6.1 (.543)	6.7 (.604)
With children	38.5 (.620)	11.3 (.381)	11.6 (.396)	11.2 (.443)	8.5 (.407)	19.1 (.433)
Women with degree less than bachelor's						
Without children	61.4 (1.80)	13.9 (1.07)	9.0 (1.07)	8.7 (.351)	3.0 (.649)	4.0 (.926)
With children	42.6 (1.18)	11.7 (.624)	8.8 (.367)	13.4 (.717)	10.2 (.741)	13.5 (.754)
Women with bachelor's degree						
Without children	57.3 (1.07)	16.8 (.538)	9.4 (.469)	7.7 (.453)	4.0 (.263)	4.9 (.381)
With children	44.6 (.640)	14.1 (.592)	12.0 (.461)	13.5 (.433)	7.5 (.328)	8.3 (.443)

NOTE: The universe consists of all NLS/PETS students who participated in the Fifth Followup survey (1986), who indicated an occupation for 1985, and who provided information on unemployment. N=7,384. Standard errors are in parentheses.

SOURCE: U.S. Department of Education, NCES, NLS-72 Special Analysis File.

Table 13.--Occupation at age 32 of men and women who had earned bachelor's degrees by age 30

Occupation	All	Men	All women	Women without children	Women with children
Managers	18.1%	21.0%	14.2%	14.0%	14.4%
Schoolteachers	13.1	6.7	21.7	17.8	26.4
Science professionals[1]	8.4	11.9	3.7	5.4	1.6
Accountants, insurance fields, and stockbrokers	6.1	6.8	5.2	6.2	4.0
"Buy/sell"	5.7	7.4	3.5	3.8	3.1
Nurses and health technologists	5.4	1.4	10.8	8.7	13.5
Office and financial services support	5.0	1.8	9.3	9.6	8.9
Medical and health practitioners	4.8	7.0	1.8	1.7	1.8
Academic professionals[2]	4.4	3.9	5.1	6.0	3.8
Other human service professionals	4.1	3.1	5.5	6.8	3.8
Craftsperson	4.0	5.6	1.8	1.6	2.0
Computer-related	3.1	3.6	2.3	2.2	2.3
Clerical other than office and financial	3.1	2.9	3.3	2.9	3.7
Lawyers and judges	2.5	3.2	1.7	2.4	0.8
Other	12.2	13.7	10.1	10.9	9.9

[1] Includes architects, engineers, scientists, mathematicians, and statisticians.
[2] Includes college teachers, social scientists, and archivists.

NOTE: The universe consists of all NLS/PETS students who earned a B.A., participated in the Fifth Followup survey (1986), and indicated both an occupation in 1985 and a full-time occupation at any time during the period 1979-86. N=3,491. All columns total 100 percent.

SOURCE: U.S. Department of Education, NCES, NLS-72 Special Analysis File.

Table 14.--Mean years employed between ages 22 and 31 (1976-85) by occupation

Occupation	Years			
	Men	Women without children	Women with children	Percent with bachelor's degrees
All	8.0 (.028)	7.8 (.043)	7.5 (.048)	53.1%
Science, technology, and health				
Computer programmers	7.4 (.298)	8.4 (.254)	8.6 (.313)	53.4
Computer systems analysts	8.6 (.206)	8.1 (.606)	7.4 (1.35)	63.6
Electrical engineering technicians	6.9 (.368)	8.9 (.213)	8.9 (.345)	14.5
Engineers (all)	8.2 (.119)	8.6 (.178)	8.8 (.098)	*100.0
Engineering and science technicians, NEC	8.4 (.150)	8.0 (.521)	8.1 (.501)	8.3
Scientists	7.9 (.217)	7.0 (.604)	6.6 (.804)	*100.0
Pharmacists	8.3 (.259)	6.6 (1.14)	7.3 (.709)	*100.0
Physicians	5.2 (.200)	5.6 (.433)	5.6 (.552)	*100.0
Health technicians	8.0 (.313)	8.3 (.197)	7.7 (.237)	50.0
Economists	8.6 (.228)	7.6 (.522)	8.5 (.350)	*100.0
Research work, NEC	7.8 (.354)	7.7 (.418)	8.5 (.280)	70.3
Human services				
Social workers	7.3 (.405)	7.8 (.262)	7.7 (.301)	82.9
Elementary school teachers	8.1 (.246)	7.9 (.193)	7.7 (.176)	*100.0
High school teachers	7.8 (.257)	7.4 (.486)	8.0 (.266)	*100.0
Other teachers, NEC	8.1 (.112)	7.4 (.153)	7.5 (.161)	88.9
School administrators	8.4 (.238)	8.6 (.270)	7.4 (.782)	*100.0
Therapists	8.6 (.219)	7.4 (.322)	7.2 (.371)	81.3
Managers, human and health services	8.1 (.229)	8.1 (.176)	8.2 (.200)	70.5
Business, finance, and management				
Personnel and labor relations	7.4 (.291)	6.9 (.313)	8.4 (.362)	65.9
Accountants	8.1 (.133)	7.4 (.243)	8.0 (.205)	73.6
Bookkeepers	8.1 (.803)	8.1 (.338)	7.5 (.248)	25.4
Buyers and purchasing agents	8.4 (.225)	9.0 (.112)	7.5 (.753)	58.5
Bank, financial, and insurance managers	8.5 (.121)	8.3 (.264)	8.3 (.250)	64.7
Managers, wholesale and retail	8.4 (.097)	7.6 (.275)	7.2 (.267)	47.6

See footnotes at end of table.

Table 14.--Mean years employed between ages 22 and 31 (1976-85) by occupation--Continued

Occupation	Years			
	Men	Women without children	Women with children	Percent with bachelor's degrees
Managers, manufacturing	8.5 (.115)	8.5 (.267)	8.1 (.318)	56.6%
Managers, communication industries	6.5 (.422)	8.0 (.285)	8.1 (.424)	60.0
Real estate agents	8.3 (.246)	6.9 (1.15)	6.7 (.736)	57.9
Estimators and investigators	8.8 (.178)	8.5 (.221)	8.2 (.249)	52.8
Production controllers	8.6 (.268)	6.7 (.402)	8.1 (.345)	21.9
Other				
Editors and reporters	8.1 (.350)	8.3 (.310)	7.8 (.573)	66.7
Lawyers	7.1 (.207)	7.0 (.303)	6.3 (.600)	*100.0
Police officers	8.8 (.100)	8.0 (.498)	8.9 (.243)	36.9
Computer equipment operators	7.8 (.326)	7.5 (.518)	6.9 (.332)	19.6

NEC = Not elsewhere classified.

* Occupation defined to include only those with requisite degrees.

NOTE: The universe consists of all NLS/PETS students who participated in the Fifth Followup survey (1986), and indicated that they were employed, had earnings in 1985, and had held a full-time job at any time between September 1979 and February 1986. N=5,864. Standard errors are in parentheses.

SOURCE: U.S. Department of Education, NCES, NLS-72 Special Analysis File.

Table 15.--Average 1985 earnings in selected occupations

Occupation	Earnings			
	Men	Women without children	Percent difference	Percent women
All	$25,022 (.010)	$18,970 (.018)	31.9%	43.4%
Science, technology, and health				
Computer programmers	23,536 (.062)	26,134 (.055)	(11.0)	32.3
Computer systems analysts	34,091 (.087)	32,797 (.246)	3.9	24.2
Electrical engineering technicians	21,305 (.070)	26,681 (.114)	(25.2)	14.5
Engineers (all)	38,804 (.023)	36,942 (.085)	5.0	6.7
Engineering and science technicians, NEC	28,139 (.048)	17,969 (.122)	56.6	23.8
Scientists	28,975 (.084)	21,053 (.138)	37.6	28.8
Pharmacists	32,312 (.063)	27,987 (.100)	15.4	35.3
Physicians	39,054 (.071)	31,458 (.208)	24.1	25.0
Health technicians	22,237 (.112)	20,998 (.079)	5.9	75.0
Economists	34,770 (.076)	33,594 (.063)	3.5	31.8
Research work, NEC	18,708 (.168)	19,086 (.145)	(2.0)	56.4
Human services				
Social workers	18,391 (.057)	16,942 (.097)	8.6	68.6
Elementary school teachers	21,403 (.051)	19,661 (.067)	8.9	87.0
High school teachers	17,538 (.091)	18,130 (.090)	(3.4)	50.7
Other teachers, NEC	19,254 (.039)	16,009 (.057)	20.3	67.7
School administrators	26,268 (.088)	18,622 (.151)	41.1	56.5
Therapists	24,168 (.066)	20,858 (.118)	15.9	75.0
Managers, human and health services	23,782 (.055)	19,205 (.062)	23.8	63.9
Business, finance, and management				
Personnel and labor relations	34,895 (.049)	31,552 (.047)	10.6	56.8
Accountants	31,082 (.033)	28,484 (.086)	9.1	37.3
Bookkeepers	14,740 (.190)	14,258 (.123)	3.4	95.2
Buyer or purchasing agents	25,385 (.078)	31,783 (.125)	(25.2)	39.0
Bank, financial, and insurance managers	34,386 (.044)	26,633 (.096)	29.1	40.3
Managers, wholesale and retail	28,365 (.040)	19,002 (.103)	49.3	25.3
Managers, manufacturing	32,879 (.041)	31,930 (.098)	3.0	22.8
Managers, communication industries	30,074 (.114)	23,508 (.186)	27.9	48.3

See footnotes at end of table.

Table 15.--Average 1985 earnings in selected occupations--Continued

Occupation	Earnings			
	Men	Women without children	Percent difference	Percent women
Real estate agents	$31,017 (.174)	$30,516 (.061)	1.6%	28.9%
Estimators and investigators	23,123 (.141)	17,476 (.112)	24.4	66.0
Production controllers	22,333 (.132)	18,380 (.039)	21.5	53.1
Other				
Editors and reporters	20,873 (.147)	25,438 (.139)	(21.9)	54.3
Lawyers	33,671 (.076)	28,667 (.073)	17.5	37.5
Police officers	28,376 (.042)	21,444 (.101)	32.3	15.4
Computer equipment operators	17,534 (.084)	18,581 (.077)	(6.0)	67.9

NEC = Not elsewhere classified

NOTE: The universe consists of all NLS/PETS students who participated in the Fifth Followup survey (1986), indicated that they had both an occupation and earnings in 1985, and identified a full-time job held at any time between September 1979 and February 1986. N=5,864. Standard errors (in parentheses) refer to the log of the dollar figure for mean earnings. In the column "Percent difference," the items in parentheses and bold type indicate occupations in which women earned more than men.

SOURCE: U.S. Department of Education, NCES, NLS-72 Special Analysis File.

Table 16.--Years of employment and average annual earnings for bachelor's degree recipients at age 32, by major

Major	All men		Women without children		Women with children	
	Employment (years)	Average annual earnings	Employment (years)	Average annual earnings	Employment (years)	Average annual earnings
All	5.63	$27,834	5.63	$21,361	5.42	$16,933
	(.027)	(.014)	(.041)	(.022)	(.049)	(.026)
B.A. major						
Business	5.87	31,098	5.91	33,230	5.52	19,483
	(.045)	(.025)	(.107)	(.053)	(.155)	(.102)
Education	5.84	21,651	5.80	18,544	5.55	17,524
	064)	(.033)	(.067)	(.042)	(.076)	(.037)
Applied social sciences	5.40	25,635	5.48	21,423	5.70	17,377
	(.138)	(.061)	(.136)	(.052)	(.156)	(.082)
Engineering and computer science	5.87	40,047	5.78	35,320	0.0	0.0
	(.072)	(.020)	(.269)	(.089)	N.A.	N.A.
Physical sciences and math	5.84	32,209	5.51	22,777	5.13	17,915
	(.084)	(.043)	(1.09)	(.205)	(.381)	(.185)
Biological sciences	5.19	29,508	5.30	22,022	4.93	19,464
	(.108)	(.060)	(.196)	(.099)	(.254)	(.117)
Health sciences	6.04	29,971	5.79	25,380	5.48	16,656
	(.085)	(.045)	(.098)	(.041)	(.113)	(.070)
Applied sciences	5.59	22,317	5.54	21,761	4.96	12,373
	(.122)	(.068)	(.217)	(.142)	(.491)	(.215)
Humanities	5.00	20,113	5.48	20,959	5.21	17,865
	(.199)	(.083)	(.162)	(.055)	(.209)	(.095)
Arts	4.85	15,993	5.60	18,337	5.43	14,820
	(.183)	(.091)	(.190)	(.124)	(.284)	(.154)
Social sciences	5.44	26,890	5.43	18,191	5.25	16,023
	(.065)	(.033)	(.110)	(.051)	(.136)	(.074)

NOTE: The universe consists of NLS/PETS students who earned B.A.'s, participated in the Fifth Followup survey (1986), indicated both that they were employed and that they had earnings in 1985, and had held a full-time job at any time between July 1979 and December 1985. N=3,068. "Employment (years)" refers to mean number of years employed between July 1979 and December 1985. The standard errors (in parentheses) for earnings refer to the log of the dollar figure.

SOURCE: U.S. Department of Education, NCES, NLS-72 Special Analysis File.

Table 17.--Race, years of employment, and 1985 mean earnings for women, by highest degree earned

Degree	White	Black	Hispanic
None			
Women without children			
Employment (years)	7.69 (.096)	7.46 (.286)	7.70 (.346)
Earnings	$15,469 (.039)	$15,363 (.120)	$19,055 (.118)
Women with children			
Employment (years)	6.48 (.093)	6.69 (.168)	6.55 (.345)
Earnings	$13,968 (.031)	$14,277 (.048)	$15,687 (.085)
Associate's			
Women without children			
Employment (years)	8.19 (.133)	5.80 (.873)	6.95 (.688)
Earnings	$18,474 (.051)	$10,915 (.108)	$16,890 (.162)
Women with children			
Employment (years)	7.21 (.138)	5.14 (.561)	6.62 (.537)
Earnings	$13,022 (.058)	$14,647 (.139)	$11,407 (.145)
Bachelor's			
Women without children			
Employment (years)	7.44 (.064)	6.95 (.192)	6.42 (.650)
Earnings	$21,091 (.023)	$24,394 (.063)	$21,586 (.163)
Women with children			
Employment (years)	7.07 (.067)	7.19 (.184)	6.91 (.450)
Earnings	$16,617 (.030)	$18,538 (.059)	$19,960 (.114)

NOTE: The universe consists of all women students in the NLS/PETS who also participated in the Fifth Followup survey (1986), and indicated that they had held a full-time job at any time between 1979 and 1985. N=3,420. "Employment (years)" refers to mean number of years employed 1976-85. Standard errors (in parentheses) for earnings refer to the log of the dollar figure.

SOURCE: U.S. Depar tent of Education, NCES, NLS-72 Special Analysis File.

Table 18.--Years of employment and mean annual earnings of bachelor's degree recipients, by race, sex, and graduate school attendance or degree

Group	All bachelor's degree recipients		Graduate school attendance or degree	
	Mean years of employment, 1979-85	Mean annual earnings, 1985	Mean years of employment, 1979-85	Mean annual earnings, 1985
All	5.57 (.020)	$23,330 (.011)	5.47 (.038)	$24,311 (.021)
Men	5.61 (.027)	27,606 (.014)	5.48 (.051)	28,379 (.027)
Women	5.52 (.031)	18,670 (.017)	5.46 (.057)	19,168 (.031)
White				
All	5.58 (.021)	23,459 (.012)	5.49 (.039)	24,302 (.022)
Men	5.63 (.027)	27,912 (.014)	5.51 (.052)	28,490 (.028)
Women	5.52 (.034)	18,396 (.019)	5.47 (.058)	18,932 (.032)
Black				
All	5.45 (.090)	21,612 (.036)	5.05 (.234)	24,748 (.093)
Men	5.21 (.182)	22,921 (.063)	4.84 (.378)	30,167 (.133)
Women	5.57 (.097)	20,989 (.044)	5.24 (.294)	20,885 (.121)
Hispanic				
All	5.27 (.146)	22,393 (.065)	5.48 (.186)	23,856 (.109)
Men	5.22 (.196)	22,344 (.086)	5.24 (.251)	22,745 (.144)
Women	5.37 (.210)	22,478 (.098)	6.00 (.177)	26,368 (.154)

NOTE: The universe consists of bachelor's degree holders in the NLS/PETS who also participated in the Fifth Followup survey (1986), and indicated both an occupation and annual earnings for 1985. N=3,231. Standard errors (in parentheses) for earnings refer to the log of the dollar figure.

SOURCE: U.S. Department of Education, NCES, NLS-72 Special Analysis File.

Table 19.--Occupational aspirations at age 19 versus actual occupations at age 32

Occupation	Men		Women	
	Planned	Actual	Planned	Actual
Clerical	0.9%	5.5%	13.5%	21.2%
Craftspersons	8.5	12.5	0.5	2.0
Operatives	2.0	5.2	0.6	1.4
Laborers	1.4	2.6	<0.1	1.5
Homemakers	0.0	[1]3.5	13.7	[1]15.5
Homemaker-students	--	0.3	--	1.0
Managers and proprietors	16.9	20.1	4.9	10.1
Professional I[2]	24.7	17.5	31.0	17.5
Professional II[3]	21.5	8.1	11.3	4.6
"Buy/sell"	1.8	6.8	0.8	3.4
Schoolteachers	6.6	3.2	16.7	9.8
Other	15.7	14.7	7.0	12.0

-- This symbol means the category did not exist in the 1973 survey.

[1] Combines all who did not indicate a job of any kind between 1979 and 1986. It thus includes full-time homemakers, full-time homemakers who were also students (as indicated), and others.

[2] "Professional I," a 1973 survey category, included accountant, artist, nurse, engineer, librarian, writer, social worker, actor, and athlete.

[3] "Professional II" included clergy, physician, lawyer, scientist, and college profeasor. In the 1986 categories, scientists are in "professional I" and librarians in "professional II."

NOTE: The universe consists of students in the PETS who (a) answered the question "what kind of work will you be doing when you are 30 years old" in the First Followup survey (1973), and (b) participated in the Fifth Followup survey (1986). N=7,249. The occupational categories of the 1973 question do not match those of 1986 perfectly. For example, the 1973 category "sales" covers (among other occupations) insurance agents. The 1986 category is expanded to "buy/sell," and insurance agents are not included. Instead, they are grouped with accountants and stockbrokers to match the 1973 category "professional I."

SOURCE: U.S. Department of Education, NCES, NLS-72 Special Analysis File.

Table 20.--Emphases of work at age 32

Work emphasis	All		Less than bachelor's degree		Bachelor's degree and higher	
	Men	Women	Men	Women	Men	Women
All						
Ideas	57.6%	53.6%	50.7%	44.9%	65.8%	64.5%
People	72.0	79.2	66.9	76.4	78.3	82.7
Paper	43.4	58.8	37.4	59.5	51.0	58.3
Things	38.3	38.0	50.0	41.7	24.1	26.7
All who said their education was relevant to their work						
Ideas	76.9%	72.3%	72.0%	61.0%	79.1%	80.4%
People	81.4	84.2	75.4	81.2	87.7	88.1
Paper	49.1	58.7	38.7	65.0	55.7	55.2
Things	38.3	36.4	61.6	50.1	24.9	23.8

NOTE: The universe consists of all NLS/PETS students who participated in the Fifth Followup survey (1986), indicated an occupation for 1985 and a full-time occupation at some time during the period 1979-85, and answered a series of questions concerning the emphases of their work. N=6,787.

SOURCE: U.S. Department of Education, NCES, NLS-72 Special Analysis File.

Table 21.--Importance of economic rewards in careers

Group	Relative importance of money			
	1 (lowest)	2	3	4 (highest)
All				
1973	14.6% (.305)	40.7% (.357)	31.7% (.268)	13.0% (.187)
1986	7.8 (.119)	55.2 (.239)	18.3 (.180)	18.7 (.203)
Men				
1973	11.4 (.447)	37.7 (.419)	34.0 (.328)	16.9 (.268)
1986	9.9 (.172)	53.6 (.370)	18.9 (.216)	17.7 (.265)
Women without children				
1973	19.3 (.504)	42 5 (.968)	30.1 (.694)	8.2 (.472)
1986	6.2 (.199)	57.8 (.743)	17.5 (.432)	18.5 (.538)
Women with children				
1973	17.1 (.320)	44.5 (.579)	29.0 (.454)	9.5 (.298)
1986	5.2 (.238)	56.4 (.328)	17.8 (.290)	20.6 (.288)
By highest degree earned to 1984				
None				
1973	13.1 (.570)	39.8 (.590)	33.7 (.413)	13.4 (.345)
1986	9.9 (.230)	57.5 (.413)	16.1 (.252)	16.6 (.287)
Certificate or license				
1973	14.7 (.719)	38.7 (1.21)	34.9 (1.24)	11.7 (.842)
1986	6.5 (.228)	53.5 (1.20)	17.6 (.71?)	22.4 (1.10)
Associate's				
1973	11.4 (.458)	38.9 (.740)	33.5 (.778)	16.2 (.640)
1986	5.7 (.340)	63.3 (.661)	15.0 (.416)	16.0 (.578)
Bachelor's				
1973	16.2 (.328)	42.3 (.613)	29.0 (.478)	12.5 (.219)
1986	6.3 (.166)	53.4 (.404)	20.2 (.378)	20.2 (.313)
Graduate				
1973	19.1 (.596)	41.5 (.944)	29.0 (.825)	10.4 (.514)
1986	6.2 (.363)	43.4 (.832)	25.5 (.580)	25.0 (.672)

NOTE: The universe consists of all NLS/PETS students who also participated in the Fifth Followup survey (1986) and who had answered questions concerning the importance of various factors in selecting a career in 1973 (N=6,279) and 1986 (N=7,734). The variable weights the importance the student attaches to income against the mean of the importance he or she attaches to the other options (see appendix A). The ratio was converted to a scale, and the scale was divided (using mean and standard deviation) in four parts. The "right tail" of this distribution (column 4), holds those who weight salary more than anything else in career choice. Standard errors are in parentheses.

Table 22.--Bucks, ego, and life values

Value	Response rating			
	1 (lowest)	2	3	4 (highest)
Money in life				
Men				
1973	17.7%	24.6%	43.0%	14.7%
1979	15.4	30.5	35.7	17.5
1986	11.4	29.6	39.1	19.9
Women				
1973	27.7	21.6	42.8	7.9
1979	19.2	34.0	36.9	10.0
1986	14.8	34.7	39.9	10.7
Self versus others				
Men				
1973	12.4	44.7	24.7	18.3
1979	7.6	35.3	42.7	14.4
1986	6.5	35.8	43.3	14.5
Women				
1973	15.8	46.9	24.2	13.2
1979	8.2	42.1	40.6	9.1
1986	8.1	43.8	39.8	8.4

NOTE: The universe consists of students who participated in the Fifth Followup survey (1986), who also participated in both the base year and the Fourth Followup surveys (1979), and who answered--on all three occasions--a series of questions concerning the relative values they placed on various life goals. N = 12,236. The relative value attached to "bucks," or, in the words of the question, "making a lot of money," is expressed in a ratio to the mean of responses to other values, (e.g., "having strong friendships"; see appendix A). The ratios for all respondents were set on a scale that, in turn, was divided by mean and standard deviation to yield four ranges. The "right tail" (value = 4) describes people for whom money is the most important value in life. The variable "ego" is also a ratio. In this case, it represents mean responses to a series of questions concerning the relative values of success, money, and leisure time set against the mean of responses to questions concerning community participation, children, and broader social concerns (see appendix A). The "right tail" (value = 4) describes people who are more concerned with themselves than with others.

SOURCE: U.S. Department of Education, NCES, NLS-72 Special Analysis File.

Table 23.--Active participation in voluntary organizations, 1986

Group	Organizations			
	Community service[1]	Professional and political	Personal development[2]	Other
All	12.0%	7.8%	30.0%	9.0%
	(.128)	(.136)	(.175)	(.141)
Men	9.2	6.2	33.7	7.6
	(.184)	(.133)	(.227)	(.253)
Women	14.7	9.5	26.4	10.3
	(.184)	(.235)	(.230)	(.140)
White	11.6	7.4	33.9	9.8
	(.153)	(.117)	(.241)	(.117)
Black	15.2	9.6	26.8	11.7
	(.623)	(.360)	(.631)	(.459)
Hispanic	13.0	10.4	29.3	8.5
	(.459)	(.387)	(1.15)	(.525)
By highest degree (PETS students only; N=8,205)				
None	11.8	7.0	31.4	8.9
	(.203)	(.184)	(.316)	(.156)
certificate or license	11.6	5.6	34.9	7.6
	(.624)	(.431)	(1.08)	(.552)
Associate's	16.4	9.0	26.0	7.4
	(.436)	(.320)	(.520)	(.352)
Bachelor's	11.6	7.8	35.8	11.6
	(.228)	(.209)	(.476)	(.208)
Graduate	9.5	10.5	38.3	12.7
	(.385)	(.373)	(.676)	(.532)

[1] Includes youth, church-related, community and social action, and education groups, and organized volunteer work.
[2] Includes social and hobby groups, sports teams and sports clubs, and literary, music, and discussion groups.

NOTE: The universe consists of all Fifth Followup survey (1986) participants who answered any of a series of questions concerning the degree of their participation in various types of voluntary organizations. The organizations were grouped into four categories, and responses indicating "active participation" only (as opposed to mere "membership") were tallied. N=12,838. Standard errors are in parentheses.

SOURCE: U.S. Department of Education, NCES, NLS-72 Special Analysis File.

APPENDIX A

Survey Questions Used in the Ratio of Importance of Money (table 21).

The basic question in the NLS-72 surveys reads as follows: "How important is each of the following factors in determining the kind of work you plan to be doing for most of your life?" The response options were "very important," "somewhat important," and "not important." The basic factor, or numerator of the ratio, was "good income to start or within a few years." For the competing options included the denominator, I selected the following:

- Job security and permanence;
- Work that seems important and interesting to me;
- Freedom to make my own decisions;
- Opportunity for promotion and advancement in the long run; and
- Meeting and working with sociable, friendly people.

Survey Questions Used in the Life Values Ratios (table 22)

The basic question in the NLS-72 surveys read as follows: "How important is each of the following to you in your life?" The response options were "very important," "somewhat important," and "not important." For the competing options in both the "bucks" and "ego" ratios, I selected the following:

- Being successful in my line of work;
- Finding the right person to marry and having a happy family life;
- Having lots of money;
- Having strong friendships;
- Being able to find steady work;
- Being a leader in the community;
- Being able to give my children better opportunities than I've had;
- Working to correct social and economic inequalities; and
- Having leisure time to enjoy my own interests.

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