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The sex segregation of occupations as a circulating system

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The sex segregation of occupations is becoming recognized as an integral feature of the occupational structure that must be understood in order to explain inequality between men and women (Reskin, 1984). A number of studies have shown the striking stability of sex segregation over the course of the century (Gross, 1968; Blau and Hendricks, 1979; Williams, 1979; England, 1981). Other research has estimated the proportion of the gender gap in wages that is attributable to sex segregation (Treiman and Hartmann, 1981; for reviews see Blau, 1984; Madden, 1985). The call for equal pay for work of comparable value has brought the sex segregation of occupations to the attention of the public (Remick, 1984).

This chapter examines whether the labor market segmentation perspective can be employed to understand occupational segregation by sex. The career mobility of women will serve as a test of the applicability of a segmentation model to occupational sex segregation. I argue that the segmentation perspective hinges on the presence of discrete, internally homogeneous segments.

Labor market segmentation and occupational sex segregation

A variety of structural approaches to inequality have been proposed in recent years. They share the view that individual attainment processes are mediated by the contexts in which they take place. The conceptualization of the relevant contexts varies from economic dualism to class location to local labor market conditions (Wright, 1979; Berg, 1981; Parcel and Mueller, 1983). The sex segregation of occupations is similarly viewed as mediating between individual attributes and labor market outcomes (Kemp and Beck, 1981). To what extent do these theories offer an explanation for occupational segregation by sex, and what implications do they hold for women's career patterns?

Among the most prominent of the structuralist theories is the economic segmentation model, which divides the economy into a core of large, stable firms with market power and a periphery of small firms in competitive industries (Beck, Horan, and Tolbert, 1978). The degree to which the dual-economy model directly explains occupational segregation by sex is debatable. There is nearly as much occupational segregation by sex within sectors as there is in the labor force as a whole. In 1981 the index of occupational segregation by sex was 65.3 for men and women working in core industries, as indicated by the Beck, Horan, and Tolbert core–periphery model, and 59.5 in peripheral industries.[1] Wharton (1985) indicates that, among blue-collar workers, sex segregation is higher than in the core, but the difference is not great. The core–periphery barrier is not as great a mobility obstacle for women as for men (Jacobs, 1983a; R. Rosenfeld, 1983). Furthermore, women are only modestly concentrated in the secondary sector. In 1981, 41% of women were located in peripheral industries versus 39% of men. Thus, the economic dualism perspective is of only limited value in explaining occupational segregation by sex.

Yet the core–periphery distinction may be useful in understanding the contexts for two more useful structuralist approaches. The first, which I call the "internal-labor-market" thesis, is set in the large organizations that are located predominantly in the core and public sectors of the economy. Internal labor markets and career ladders have been the focus of a good deal of interest in stratification research since Baron and Bielby (1980) called for more attention to firms. There is growing evidence for the gender effects of internal labor markets. It is clear that women in clerical jobs have limited promotion opportunities within firms (Glenn and Feldberg, 1979), and evidence is accumulating regarding the deleterious effects of promotion ladders on women's careers (Rosenbaum, 1984). Coverman (1986) argues that female-dominated occupations operate under a set of often implicit rules and procedures which can be distinguished from those to which men are subjected. She maintains that women's work is not integrated into bureaucratic lines of authority and implicitly into male-dominated career ladders. This perspective cannot account for segregation among firms (Blau, 1977; Talbert and Bose, 1977) or among industries (Bridges, 1982), but the prevalence of firms with internal career ladders underscores the importance of this hypothesis.

A second line of structuralist reasoning, which I call the sex segregation as segmentation thesis, suggests that the sex segregation of occupations itself constitutes a form of segmentation (Bridges, 1982). Burris and Wharton (1982) have claimed that segregating workers by sex is a way of stratifying the work force to effect employer's strategy of divide and

conquer. They argue that, rather than employ lower-paid women in all possible areas in order to minimize their wage bills, employers employ existing cultural definitions about the sexual division of labor to drive a wedge between workers and obscure their common interests. They explain the persistence of occupational segregation by sex, despite the neo-classical economic prediction of its demise, with reference to the desire of employers to fragment the organization of work and the characteristics of workers. This reasoning may be particularly applicable in the periphery of the economy, where the technical division of labor is less elaborate and where there are fewer detailed job ladders to divide workers.

Thus, two separate strands of structuralist logic offer explanations for the persistence of occupational segregation by sex. One important implication of both views is that there is little mobility between female-dominated and male-dominated occupations. The internal-labor-market thesis implies that women and men are segregated because their *careers* are segregated. The structure of opportunities built into job ladders promotes and reinforces occupational segregation. Thus, a large degree of movement between female-dominated and male-dominated occupations would be contrary to the internal-labor-market thesis. In the case of the segregation as segmentation thesis, the rationale for segmenting work also implies a motivation to differentiate the career lines of men and women. Specifically, one would predict little movement from female-dominated occupations to male-dominated occupations, for this movement would undermine the division of workers that constitutes employers' motive for segregation.

The present analysis seeks to examine these suggestions empirically. Can sex segregation itself be considered a type or dimension of labor market segmentation? To answer this question, data on three specific issues will be examined: (1) How much mobility do women experience between male-dominated, sex-neutral, and female-dominated occupations? (2) What are the boundaries of the sex-composition-based segments: (3) How does this segmentation intersect with other structural and demographic variables?

R. Rosenfeld (1983) as well as Corcoran, Duncan, and Ponza (1984) present evidence indicating a significant amount of mobility between male-dominated and female-dominated occupations. This work raises the distinct possibility that the assumption of immobility at the core of labor market segmentation theory is not supported empirically. Yet Corcoran et al. rely on relatively crude two-digit occupation and industry data, which mask a good deal of occupational segregation by sex, and Rosenfeld simply looks at a discrete male-dominated versus female-dominated boundary over a one-year period. I will consider a range of possible boundaries between the male-dominated and female-dominated occu-

pational spheres, employing data over a longer time period and employing as much detail as is possible with survey data.

The broad significance of this question for theories of labor market segmentation should be apparent. A finding of little or no mobility between male-dominated and female-dominated occupations would be consistent with the labor market segmentation perspective. Substantial mobility would cast doubt on a primary assumption of the segmentation approach.

Even if there are barriers to mobility, the mobility patterns must conform to a segmentation model. Two necessary specifications of a labor market segmentation model are that mobility be (1) infrequent between segments and (2) frequent within segments. Segments must be discrete, homogeneous categories. The boundaries of the segments must constitute barriers to mobility. If there were no such barriers, it would be difficult to make a case for the existence of segments. If segments are not internally homogeneous, they cannot be distinguished from strata or from a continuous model of sex segregation. Thus, in the case of sex-based segments, one must show not only that mobility from female-dominated to male-dominated occupations is difficult, but also that mobility within each of these divisions is easy.

This reasoning places the number of categories and the ranges they cover at the center of the analysis. Studies of sex segregation are not in accord as to how to define male-dominated and female-dominated occupations. Researchers generally pick an approach for the purposes at hand without considering possible statistical justification for their choice. Some of those who advocate a two-category approach focus primarily on entry into male-dominated occupations. For them, everything over 20 or 30% female is grouped into a single category (e.g., Beller, 1982). Others are interested in the concentration of women in female-dominated occupations (e.g., Oppenheimer, 1976). They chose 70 or 80% female as the dividing line, collapsing all other occupations into a "not-female-dominated" residual category. Typically only two categories, a male-dominated category and a female-dominated category, are employed, despite the large number of women employed in sex-neutral occupations and despite theoretical reasons to question the grouping of such occupations with the extremes (Kanter, 1977). Although it is often noted that relatively few occupations are sex neutral, a substantial proportion of individuals work in these occupations. More than one-third of women in 1970 (34.2%) worked in occupations with between 30 and 69.9% women.

Breiger (1981) has argued that the choice of appropriate categories should be the focus of analysis rather than a decision made before the beginning of analysis. This is particularly true for hypotheses regarding

segmentation, since the existence and boundaries of the segments are themselves objects of analysis. Breiger (1981) and Goodman (1981) have proposed models for testing whether categories in a mobility table can be collapsed. These models are ideal for testing labor market segmentation hypotheses. The analysis determines whether the sex-type mobility table can be collapsed into a small number of discrete categories or segments. These models are employed to test for the existence of sex-composition-based segments and to aid in determining the boundaries of the segments.

A final set of issues for analysis is the possibility of interactions of sex segregation with other labor market structures and with demographic variables. I examine whether the patterns of mobility observed interact across economic segments and for different types of workers. This analysis indicates the generality of the patterns observed.

The analysis in this chapter is designed to address these three specific issues. First, the degree of career (intragenerational) mobility that crosses sex-composition categories is assessed. The relationship between the sex composition of previous and subsequent occupations is examined for those who change occupations. Second, the boundaries of sex-composition-based labor market segments are examined with Breiger and Goodman models for collapsing categories in contingency tables. Third, log-linear models are employed to test the applicability of the segmentation model to a variety of labor market contexts and a range of demographic groups.

Data and methods

The National Longitudinal Survey of Mature Women (NLS) contains data on a nationally representative sample of 5,083 women aged 30 to 44 in 1967 (Parnes, Jusenius, and Shortlidge, 1973). The NLS women were interviewed eight times between 1967 and 1977. The persistence rate in the study has been quite high: By the eighth wave (1977) 78% of the respondents remained in the sample. Data on a wide range of variables were collected.

The *Current Population Survey* (CPS) includes information on very large samples of individuals for a short time span (Bureau of Labor Statistics, 1976). In March, the CPS includes a limited set of questions about the respondent's major activities during the previous year. The data thus provide two measures of the occupation of employed individuals at a one-year interval. This information can be used to examine short-term changes in occupation and employment status.

I have analyzed the March 1981 CPS data, which provide information

about occupational changes between 1980 and 1981. The CPS data have several attractive features. The very large sample size (85,000 households with information on nearly 100,000 employed individuals) enables one to generalize with a great deal of confidence. The CPS data employ the 1970 Census occupational classification scheme; the NLS data are coded for the less detailed and more error-prone 1960 Census occupational classification scheme. In addition, a full age range of women is included in these data, whereas the NLS data are restricted to the 30–44 age group. Finally, the CPS data allow for comparisons between the short-term mobility patterns of men and women. The two data sources thus complement each other.

The basic methodological approach is quite straightforward. The detailed occupation (Census three-digit occupation) of each respondent is coded for percent female.[2] The analysis focuses on the relation of the percent female in the respondent's occupation in one year with the percent female in the respondent's occupation in subsequent years. The analyses typically focus on only those individuals who changed their detailed occupation, an important methodological choice discussed in the following section. The percent female scores are grouped into categories, for male-dominated, female-dominated, and sex-neutral occupations. The analysis involves statistical tests of the appropriateness of different partitions of the sex-type mobility table. Log-linear models are employed for the partitioning analysis as well as for tests of the generality of the mobility patterns. The serial correlation in the percent female in an occupation is referred to as the "sex-type correlation"; the extent of mobility is referred to as "sex-type mobility." Before turning to the results of the analysis, we will first discuss theoretical constraints on the sex-type mobility table.

Results

The results are presented in four sections. The first considers the theoretical constraints on the extent of movement between male-dominated and female-dominated occupations. The second section presents evidence on the extent of sex-type mobility. The third section examines the partitioning models of the sex-type mobility table. The fourth presents log-linear models of the generality of the mobility patterns for several labor market situations and for a range of demographic groups. The implications of these findings for theory and policy are presented in the conclusion.

Theoretical constraints on sex-type mobility

It must be clarified at the outset that significant occupational segregation by sex does not preclude a high degree of occupational mobility by men and women between male-dominated and female-dominated occupations. Even though most women work in female-dominated occupations and most men work in male-dominated occupations, a very large amount of movement between these categories is possible. A high degree of occupational segregation by sex, which determines the marginal distributions of the mobility table, is consistent with a very broad range of mobility patterns.

Table 8.1 presents hypothetical results designed to indicate the maximum, minimum, and expected mobility of women between male-dominated and female-dominated occupations. For convenience, let us group all occupations with 0–29.9% women under the label "men's occupations." Occupations with 30–69.9% women will be grouped into a second category, "sex-neutral occupations." Finally, occupations with 70–100% women will be grouped into a third category, "women's occupations." Table 8.1 describes the mobility of a hypothetical sample of 100 women, with the marginal distributions representing the actual distribution of women in the NLS sample in 1967 and in 1977.

Panel A of Table 8.1 depicts the maximum mobility of women across sex-type categories between 1967 and 1977, assuming 100% turnover. The table was constructed by moving the hypothetical sample of 100 women as far as the available "spaces" would allow under a "musical chairs" principle of mobility. Assuming 100% turnover, only 3.9% of women would be forced to stay in the same sex-type category in which they started.

Panel B of Table 8.1 depicts the other extreme, minimum mobility. Since the overall distribution of women changed slightly between 1967 and 1977, some movement was necessary. Panel B indicates that 8.6% of the women would have had to move between categories in order to be consistent with the overall distribution of women into sex-type categories.

Panel C of Table 8.1 presents the expected amount of mobility across sex-type categories, still assuming 100% turnover. Assuming that movement is random with respect to sex-type of occupation, 41.1% of women would stay in the same categories. To avoid later misinterpretation, it should be stressed that independence or randomness does not mean that men and women can move freely between male-dominated and female-dominated occupations. Randomness in this context does not mean that there is equal opportunity. Statistical independence does not mean that

Table 8.1. *Hypothetical mobility for NLS sample women, 1967–1977, for 3 by 3 sex-type mobility table, assuming 100% turnover*

A. Maximum mobility

	Count row %	1977 0–29.9% female	30–69.9% female	70–100% female	Row total
	9–29.9% female			10.4 100%	10.4 100%
1967	30–69.9% female			35.8 100%	35.8 100%
	70–100% female	15.2 28.2%	34.8 64.6%	3.9 7.2%	53.9 100%
	Column total	15.2 15.2%	34.8 34.8%	50.1 50.1%	100 100%

B. Minimum mobility

	Count row %	1977 0–29.9% female	30–69.9% female	70–100% female	Row total
	0–29.9% female	10.4 100%			10.4 100%
1967	30–69.9% female	4.8 13.4%	31.0 86.6%		35.8 100%
	70–100% female		3.8 7.1%	50.1 92.9%	53.9 100%
	Column total	15.2 15.2%	34.8 34.8%	50.1 50.1%	100 100%

C. Expected mobility

	Count row %	1977 0–29.9% female	30–69.9% female	70–100% female	Row total
	0–29.9% female	1.6 15.2%	3.6 34.8%	5.2 50.1%	10.4 100%
1967	30–69.9% female	5.4 15.2%	12.5 34.8%	17.9 50.1%	35.8 100%
	70–100% female	8.2 15.2%	18.7 34.8%	27.0 50.1%	53.9 100%
	Column total	15.2 15.2%	34.8 34.8%	50.1 50.1%	100 100%

women have an equal chance of ending up in men's and women's occupations. Rather, independence means that the likelihood of starting and ending in an occupational category depends only on the proportion of women in that occupational category. Given the highly skewed distribution of men and women in occupations, the likelihood of women starting and ending in women's occupations is quite high (27% of the sample); the likelihood of women starting and ending in men's occupations is quite low (1.6%) under the assumption of statistical independence (or randomness).

Making the unrealistic assumption of 100% occupational change in the period considered, Table 8.1 indicates that the extent of sex-type mobility may range from almost complete mobility (96.1% mobile) to almost complete immobility (91.4% immobile). The expected amount of mobility would be quite substantial (58.9%). The actual degree of mobility is thus very much an open question, even in a highly aggregated table.

This line of reasoning produces another important consequence. We can think of a career mobility table as being represented by the sum of two tables, one for "stayers" and another for "movers" (Blumen, Kogan, and McCarthy, 1955). "Stayers" are those who remain in the same three-digit occupation in the period considered; "movers" are those who change their detailed occupational category.[3] Stayers experience no mobility; movers, however, experience mobility opportunities constrained in part by the amount of structural change and in part by the turnover rate. In a system with little structural change, such as the system of sex segregation, the mobility patterns of movers are quite similar to those described by 100% turnover.[4] Thus, the tables for 100% mobility are informative because these theoretical tables approximate the maximum, minimum, and expected mobility patterns of the portion of individuals that move in the period considered. In sum, the mobility pattern of the group of occupation changers is not tightly constrained by the high levels of sex segregation found in the present occupational system.

An analysis of career mobility between different occupational segments appropriately focuses on "movers," those changing their detailed occupation. If one wishes to test the permeability of certain occupational categories, the group who changed occupations in the period considered is the best test group (Jacobs, 1983a). Quite simply, one cannot change the sex type of one's occupations unless one changes one's occupation. We know in advance that the serial sex-type correlation for "stayers" is ·1.0; all individuals who do not change occupations are found on the diagonal of the mobility table. The interesting question is the probability of changing sex-type categories for those who changed their detailed occupation in the period considered.

Although over a short period of time most people are "stayers," it does not follow that "movers" are a small, aberrant, and uninteresting group. A large fraction of people change occupations at some point in their career. For example, 1970 Census data indicate that 32% of employed individuals changed occupations between 1965 and 1970 (Somers and Eck, 1977; see also C. Rosenfeld, 1979). Of the NLS women, more than 55% changed detailed occupations between 1967 and 1977. Though there is reason to believe that this figure exaggerates the extent of mobility due to measurement error, the data nonetheless indicate that changing detailed occupational categories is not rare. Occupation changes are thus widely experienced at some point in most individuals' careers. Focusing on occupation changers gives us leverage in tracing the contours of career opportunity in the occupational structure.

Evidence on sex-type mobility

Let us now examine the patterns of movement for NLS women between 1967 and 1977, viewing this period as a single occupational transition. Panel A of Table 8.2 presents the cross-tabulation of the percent female in a woman's detailed occupation in 1977 by the percent female in a woman's detailed occupation in 1967, grouped into three categories: 0–29.9% female, 30–69.9% female, and 70–100% female. Panel A of Table 8.2 compares the sex type of (last or current) occupation for women in 1967 with their (last or current) occupation in 1977.[5] The correlation between percent female in 1967 and percent female in 1977 is only a moderately strong Pearson's $r = .38$.

Included in panel A is a large number of women who did not change occupations. This group is found entirely on the main diagonal, which has the effect of inflating the observed relationship. Panel B of Table 8.2 is restricted to women who changed their detailed occupational category between 1967 and 1977. It reveals no correlation between the sex type of occupation in 1967 and that in 1977 for women who changed occupations in the interim. For occupation changers only, a very great degree of movement is indicated.

Panel C of Table 8.2 presents the ratio of observed values to expected values for women occupation changers. All values are close to 1.0. The striking result is that, for occupation changers, the sex type of destination occupation is independent of the sex type of origin occupation.

Supplemental data from the March 1981 CPS corroborate these findings. Panel A of Table 8.3 presents the 3 by 3 sex-type mobility table for all CPS sample women occupation changers employed in both years. The correlation for women occupation changers is quite low ($r = .10$). The year-to-year sex-type correlation is only slightly positive. The correlation

Table 8.2. *Mobility for NLS sample women, 1967–1977, for 3 by 3 sex-type mobility table*

A. All employed women[a]

Count row %	1977			
	0–29.9% female	30–69.9% female	70–100% female	Row total
1967 0–29.9% female	183 46.9%	96 24.6%	111 28.5%	390 10.4%
30–69.9% female	173 12.9%	827 61.4%	346 25.7%	1,346 35.8%
70–100% female	214 10.6%	386 19.1%	1,426 70.4%	2,026 53.9%
Column total	570 15.2%	1,309 34.8%	1,833 50.1%	3,762 100%

B. Women occupation changers[b]

Count row %	1977			
	0–29.9% female	30–69.9% female	70–100% female	Row total
1967 0–29.9% female	50 19.5%	96 37.4%	111 43.2%	257 11.9%
30–69.9% female	173 21.1%	299 38.6%	346 42.3%	818 37.7%
70–100% female	214 19.6%	386 35.3%	492 45.1%	1,092 50.4%
Column total	437 20.2%	781 36.0%	949 43.8%	2,167 100%

C. Ratio of observed to expected occupation changers

Count row %	1977		
	0–29.9% female	30–69.9% female	70–100% female
1967 0–29.9% female	.97	1.04	.99
30–69.9% female	1.05	1.02	.97
70–100% female	.97	.98	1.03

[a] Chi-squared = 1,086.3; 4 df; $r = .38$ ($p < .001$).
[b] Chi-squared = 1.8; 4 df; $r = .02$.

Table 8.3. *Mobility for CPS occupation changers, 1980–1981, for 3 by 3 sex-type mobility table*

A. Women occupation changers[a]

		1981			
	Count row %	0–29.9% female	30–69.9% female	70–100% female	Row total
	0–29.9% female	243 28.6%	240 28.2%	367 43.2%	850 21.2%
1980	30–69.9% female	274 24.4%	270 24.0%	579 51.6%	1,123 27.9%
	70–100% female	388 19.0%	543 26.6%	1,114 54.5%	2,045 50.9%
	Column total	905 22.5%	1,053 26.2%	2,060 51.3%	4,018 100%

B. Men occupation changers[b]

		1981			
	Count row %	0–29.9% female	30–69.9% female	70–100% female	Row total
	0–29.9% female	2,701 76.6%	637 18.1%	187 5.3%	3,525 76.9%
1980	30–69.9% female	559 69.3%	182 22.6%	66 8.2%	807 17.6%
	70–100% female	157 62.5%	58 23.1%	36 14.3%	251 5.5%
	Column total	3,417 74.6%	877 19.1%	289 6.3%	4,583 100%

[a] Chi-squared = 45.5; 4 df; r = .10 (p < .001).
[b] Chi-squared = 54.8; 4 df; r = .11 (p < .001).

for the 35–44 age group, which is the same age range as the NLS sample, is .06, compared with .02 for the NLS sample. Neither correlation is statistically significant.

Panel B of Table 8.3 presents the sex-type mobility table for all employed men in the CPS sample. The sex-type correlation for male occupation changers is also quite low (r = .11). The evidence indicates a very substantial amount of sex-type mobility for men as well as women.

One should be cautious in comparing the NLS and CPS results. The NLS data cover a 10-year period; the CPS data, a 1-year period. Thus, the NLS women may be changing occupations more than once, which

may have the effect of reducing the correlation. Yet there is almost certainly more coding error in the NLS data, which has the consequence of increasing the correlation for occupation changers.[6] Taken together, the two sets of data provide strong support for the conclusion that the sex-type correlation for women occupation changers is no more than slightly positive. It seems clear that, while occupational segregation is very stable at the aggregate level, it is much more fluid at the micro or individual level. While the structure of occupations is highly segregated, individuals do have some degree of flexibility in changing the sex type of their occupations during their careers.

In addition to the 1967 to 1977 transition, the first job to 1967 job transition was examined for the NLS data. For the 46% of the sample of women who changed occupations between their first job and their job in 1967, there is no correlation between the sex type of initial occupation and the sex type of 1967 occupation (r = −.02, p < .20, n = 2,342). Since most of the NLS mature women started their first job in the late 1940s or early 1950s, this result indicates that the sex-type mobility patterns presented in Table 8.3 are not a recent development but were also characteristic of the career patterns of women throughout the post–World War II period. This evidence clearly indicates that, for extremely large, representative national samples, the serial correlation of the sex composition of occupations for women who change occupations is extremely weak.

Partitioning the sex-type mobility table

In this section the structure of the sex-type mobility table is examined in greater detail. Initially we can determine whether the weak relationship documented in the preceding sections is the result of excessive collapsing of the sex-type mobility table. Table 8.4 presents a set of correlations from the 1981 CPS data. The figures clearly indicate that, whether the variables are measured in a continuous or discrete manner, the sex-type correlations remain low.

Bielby and Baron (1984) have documented extremely high levels of sex segregation using data on job titles within firms. Their data raise the possibility that the mobility documented here is more apparent than real, an artifact of excessively broad occupational classifications. Bielby and Baron's data are three levels more detailed than those employed here: They can distinguish industries, firms, and job titles within firms. We can assess the significance of the first of these with the data at hand.

The final row of Table 8.4 presents the sex-type correlation for sex composition measured continuously for detailed occupation by industry categories. A sex-composition score was calculated for each occupation

Table 8.4. *Sex-type correlations by measurement detail, 1980 by 1981, for CPS women and men occupation changers*

	Women (n = 4,018), r	Men (n = 4,583), r
Three sex-type categories (0–29.9% female; 30–69.9% female; 70+% female)	.10	.11
Five quintile categories (0–19.9% female, etc.)	.11	.11
Ten decile categories (0–9.9% female, etc.)	.11	.14
Continuous measurement (13.2% female, etc.)	.11	.15
Continuous measurement, detailed occupation by detailed industries*	.14	.17

*See text for an explanation.

by industry category if it differed from the occupational average by 10 percentage points or more. This procedure produced 63 new occupational categories, increasing the number of categories from 426 to 489, or 15%.

The sex-type correlation using this more detailed measure of sex composition is slightly higher than that found using the 426 detailed occupational categories ($r = .14$ for women; $r = .17$ for men). Thus, although the effect of more detailed measurement is to increase the correlation, as expected, the effect is not large. Increasing the detail of the units employed here to the maximum increases the sex-type correlation only slightly. A more direct test of the appropriateness of the proposed partition of the sex-type mobility table can be approached via log-linear analysis of the sex-type mobility table. Breiger (1981) and Goodman (1981) have proposed approaches to collapsing mobility tables. The essential idea is to obtain partitions of the mobility table that are internally homogeneous. Goodman's approach has a stronger criterion for homogeneity than does Breiger's. For the three category model proposed, tests of Breiger's model involve tests of homogeneity within nine subtables; Goodman's model involves tests of homogeneity within three broad subtables.

Table 8.5 presents tests of the three-category model for both the Breiger and Goodman models. The starting point is a 10 by 10 sex-type mobility table, the rows and columns of which are the percent female deciles noted earlier. The analyses test whether the three categories presented throughout this chapter are homogeneous. Results are shown for the model that excludes the diagonal, the approach most often reported in the literature.

The three-category model fits the CPS data for both the Breiger and the Goodman models. The CPS data fit both models even with the di-

Table 8.5. *Tests of partition of sex-type mobility tables for Breiger and Goodman models*

	Breiger model (df = 39)		Goodman model (df = 67)	
	Partition 1,[a] L^{2c}	Partition 2,[b] L^{2c}	Partition 1,[a] L^{2c}	Partition 2,[b] L^{2c}
CPS 1980 × 1981	29.59 $p < .90$	29.32 $p < .90$	66.08 $p < .60$	58.14 $p < .80$
NLS first × 1967	44.06 $p < .30$	52.45 $p < .10$	96.79 $p < .01$	95.22 $p < .05$
NLS 1967 × 1977	72.14 $p < .001$	49.36 $p = .20$	130.42 $p < .001$	134.63 $p < .001$

[a]Partition 1 is the three-category partition discussed throughout the chapter. The male-dominated occupations encompass those with 0–29.9% women; the sex-neutral occupations are those with 30–69.9% women; and the female-dominated occupations are those with 70–100% women.
[b]Partition 2 follows Partition 1 except that the male-dominated category is broader, ranging from 0 to 39.9% women.
[c]L^2 designates the likelihood ratio goodness of fit.

agonal included. The Breiger model fits the NLS data for the first job to 1967 job transition; the Goodman model does not fit this table. Both the Breiger and Goodman tests are rejected for the NLS data for the 1967 to 1977 transition. A slightly modified partition, including 0–39.9% female occupations in a single male-dominated category, produces an acceptable fit for the Breiger model for all three mobility tables, although the alternative partition produces higher chi-squared statistics for the first NLS table than does the initial partition. No three-category partition produces a fit of the Goodman model for the NLS 1967–77 table.

All contiguous two-category partitions of these tables were tested. There is no such partition that produces an acceptable fit in all three tables for either the Goodman or the Breiger model. These tests indicate that a three-category partition of the sex-type mobility table fits the data, but the precise boundary between the male-dominated and sex-neutral category is not entirely consistent across all three tables examined. These results also underscore the utility of the Breiger model in fitting partitions of large mobility tables.

These results indicate the presence of three distinct segments, comprising male-dominated, sex-neutral, and female-dominated occupations. Yet the boundaries between these segments are very weak, as indicated

Table 8.6. *Three-way log-linear models of sex-type mobility: tests of log-linear models including all two-way relationships*

	CPS 1980 × 1981			NLS 1967 × 1977	
	L^2	df	p<	L^2	p<
Occupation and industry variables					
Blue collar vs. white collar	6.04	4	.20	18.04	.01
Four occupational categories (professional, other white collar, service, other blue collar)	18.57	12	.10	14.84	.30
Economic sector, Tolbert–Beck–Horan model	3.72	4	.50		
Economic sector, Bibb–Form model	6.12	4	.20		
Demographic variables					
Race	5.04	4	.50	6.73	.20
Age	13.64	12	.40	7.45	.20
Education	33.81	16	.01	28.48	.01
Marital and family status	15.35	12	.22	8.22	.80

by the pervasive mobility discussed earlier. The extent of mobility limits the analytic force of the segmentation model.

Variation in mobility patterns

Table 8.6 presents tests of the uniformity of the sex-type mobility table across several dimensions of the occupational structure and for a variety of demographic groups. This analysis is designed to indicate whether the patterns found here apply to a broad range of labor market settings and to individuals with a variety of demographic characteristics.

Log-linear tests of the proposition that sex-type mobility is consistent across these independent variables presented in Table 8.6 models include all two-way relationships but exclude the three-way interaction, namely, the dependence of the sex-type correlation on the independent variable.

The labor market characteristics examined are collar color of the occupation; a more detailed four-category occupational scheme, which contrasts professional and managerial to other white-collar occupations and service jobs to other blue-collar jobs; and economic sector (as measured by both the Tolbert–Beck–Horan model and the Bibb–Form models).

The demographic characteristics examined are age (14–24; 25–34; 35–44; 45 +); race (white vs. nonwhite); marital and family status (ever married with children; never married with children; ever married without children; never married without children); and education (1–11 years completed, 12 years; 13–15 years; 16 years; 17 + years).

With the exception of education, each of the tests fits the CPS data,

indicating that the pattern of sex-type mobility does not vary with race, age, collar color, economic sector, or marital and family status. Education interacts with the mobility relationship for both the CPS and the NLS data, but the relationships do not take the same form for these two data sets. The strongest relationship for the CPS data is found for the 13–15 years of education group; in the NLS data the 1–11 years of schooling group has the least mobility. Collar color does not fit for the NLS data, but it does fit when the diagonal is excluded ($L_2 = 7.8$; df = 8), and the more detailed four-major-occupation model also fits the data.

It should be noted that the log-linear models tested here are weak ones, assuming no ordering of the categories and no uniform relationship between these categories. Imposing stronger assumptions may produce models that do show an interaction with independent variables. The substantive conclusion that there is no dramatic variation in sex-type mobility across a broad spectrum of contextual and demographic third variables, however, seems likely to be supported.

The effect of a number of other independent variables on the pattern of circulation described here has been examined. A detailed discussion of these results is found elsewhere (Jacobs, 1983b). Other occupational characteristics, such as socioeconomic status and self-employment were considered. Factors potentially affecting work commitment, including number and ages of children, weeks employed, and hours worked per week were examined. And other background factors, such as region and urbanism, were studied. None of these variables dramatically altered the pattern of circulation described here. The sex-type correlations for the CPS 1980–1 transition cluster in the range of .05 to .2 for women and men for all subgroups of the above variables. A high degree of sex-type mobility is evident among a broad spectrum of workers at all age levels and is evident in a broad variety of employment settings.

Conclusion

This chapter has presented evidence from two data sources that documents a significant amount of career movement between female-dominated, sex-neutral, and male-dominated occupations. The observed levels of movement approach what would be expected by chance. For occupation changers, the chances of ending in a given sex-type category are virtually independent of the sex-type category in which the person started. This pattern is evident for women of all age groups in the labor force; it is also true for men occupation changers of all age groups. It characterizes workers in a broad spectrum of occupations and workers from a broad spectrum of backgrounds. This evidence points in the same

direction as that found in two recent investigations of movement between male-dominated and female-dominated occupations (Corcoran et al., 1984; R. Rosenfeld, 1984). The substantial degree of mobility between men's and women's occupations should not be misinterpreted as evidence of equal opportunity. Only a limited number of women work in men's occupations. Given this limited number, the chances of entry and exit are close to what one would expect by chance. Movement between these categories is not substantially more limited than the overall distribution of men and women would predict. In other words, women occupation changers are only slightly more restricted in moving into men's occupations than are women who are starting their careers.

Perhaps most striking is the mobility of women from male-dominated occupations to sex-neutral and female-dominated occupations. A large proportion of women in male-dominated occupations leave when they change occupations. By 1977, 50% of women who had been in male-dominated occupations in 1967 were employed in sex-neutral or female-dominated occupations. Among women who had changed occupations in this period, more than 80% who had been in male-dominated occupations in 1967 had left by 1977. The data suggest that employment in female-dominated occupations constitutes less of a barrier for women than might have been expected by labor market segmentation theorists. However, the data also indicate that employment in male-dominated occupations is not as permanent an achievement for women as might have been expected.

This evidence can be viewed as describing the pattern by which the sex segregation of occupations is reproduced. The system of sex segregation is reproduced by a process of circulation between men's and women's occupations. The low year-to-year sex-type correlations indicate that individuals are not completely locked into the sex type of occupations in which they begin their careers. For the large group of occupation changers, the sex types of initial and subsequent occupations are only slightly related.

This finding brings into question the applicability of labor market segmentation explanations of occupational segregation by sex. We have seen how both the internal-labor-market thesis and the segregation-as-segmentation thesis hinge on the infrequency of mobility between male-dominated and female-dominated occupations. We have shown that the presumption of these approaches is not accurate. More detailed data on movement within firms may bolster the internal-labor-market thesis, but this will not completely invalidate current results. If the sex-type mobility documented here does not occur within internal labor markets, then the present data show how frequently these internal channels are circumvented.

The segmentation approach is not the only one that assumes limited career mobility between male-dominated and female-dominated occupations. Corcoran et al. (1984) argue that mobility between male-dominated and female-dominated occupations raises questions for the human capital explanation of occupational segregation by sex, because the presumed human capital gradient between male-dominated and female-dominated occupations would make such mobility infrequent. These mobility patterns also bring into question theories that stress the role of socialization in maintaining occupational segregation by sex (Jacobs, 1985). In the language of mobility tables, the study of sex segregation to date has assumed that sex-type mobility tables were concentrated on the main diagonal, that to explain the marginal distributions was also to explain the career patterns as well. In other words, if the occupational system is highly segregated by sex, the careers of individual women will inevitably be tracked into narrow sex-typed channels.

The data presented here show not only that a large amount of movement between male- and female-dominated occupations is possible, but that in fact a good deal of this type of occupational mobility exists. Theories of sex segregation will have to take this fact into account.

A general perspective on sex segregation compatible with the data discussed here must emphasize the importance of career experiences. The interest of women in entering male-dominated occupations is not difficult to explain: The exit of women from male-dominated occupations is the counterintuitive result calling for an explanation. Though discrimination in hiring is undoubtedly a major factor in restricting access of women to male-dominated occupations, those women who succeed in obtaining such employment face a host of reminders on the job that they are less than welcome. A great deal has been written about the difficulties women face once they enter what were previously male bastions (U.S. Department of Labor, 1978; Epstein, 1981; Walshok, 1981; see Roos and Reskin, 1984, for a review).

Kanter (1977) has presented perhaps the most theoretically appealing explanation for these difficulties. She argues that minority status per se creates a host of problems for women, including systematic misperception by the majority, a lack of political allies, and difficulties in winning acceptance from peers and subordinates. By providing a detailed examination of the social psychology of workplace interactions combined with a sensitive recognition of the inequalities in power, Kanter makes a very persuasive case for the role of proportions in general and of token status in particular.

Kanter's approach provides a theoretical basis for understanding the mobility patterns documented here. The pressures Kanter analyzes may

account for the reluctance of women to persist in male-dominated settings. Though recent evidence suggests that women in male-dominated occupations do not experience higher turnover rates than men (Waite and Berryman, 1985), those who leave are shown here to be unlikely to pursue other male-dominated occupations. Though research following up Kanter's hypothesis has generally focused on the behavioral consequences for minorities (Spangler, Gordon, and Pipkin, 1978; Alexander and Thoits, 1985), the implications for attrition and mobility patterns have not been explored. Indeed, one possible reason for the inconsistent empirical tests of Kanter's hypothesis is that these studies have not controlled for attrition rates (Jacobs, 1986a).

Career experiences may thus be critical in determining the career destinations of individual women and in general serve to perpetuate a stable system of segregation by sex. The system of circulation is an important component of a broader set of social controls that maintain the system of segregation.

It should be noted that the same circulation is evident for men. Many men work at some point in occupations in which women are numerically predominant. But they tend to leave these occupations, again creating "room" for more men to enter. Female-dominated occupations remain so heavily dominated by women in part because so few men enter them and in part because those men who enter tend to leave. This evidence suggests that there are problems inherent in incumbency in sex-atypical occupational roles (Jacobs and Powell, 1984). In some ways men in female-dominated occupations experience the same difficulties that women in male-dominated occupations face. However, this analogy should not be pushed too far: Men leaving female-dominated occupations often do so through promotions.

The present results suggest an explanation for a puzzling finding regarding women's occupational choices. Much research has assumed that women working in male-dominated occupations are different from women working in female-dominated occupations. Since little career mobility is assumed to occur, this line of research has attempted to distinguish what factors lead certain women into the career channels that effectively exclude most women. However, much of this research to date has failed to identify powerful predictors that distinguish women in male-dominated occupations from other women (Brito and Jusenius, 1974; Daymont and Statham, 1981). The proportion of the variance explained in these studies is very low (see Waite and Berryman, 1985).

The data on sex-type mobility suggest an explanation for the limited progress of this research. Women in male-dominated occupations may not be different from women in female-dominated occupations, since a good fraction of them migrated from female-dominated occupations.

Furthermore, women in male-dominated occupations may not be different from women in female-dominated occupations because they stand a good chance of migrating back. Given the pattern of circulation indicated here, the lack of strong predictors that differentiate between women in male-dominated occupations and women in female-dominated occupations becomes more understandable. The question of distinguishing these groups of women is urgent only if one assumes a static system in which there is little movement of women between male-dominated and female-dominated occupations.

For those interested in increasing women's employment in male-dominated occupations, these results have a positive side and a negative side. The positive side is that there is more access for women into male-dominated occupations than one might have thought. Women occupation changers can enter men's occupations; they often do. The negative side is that there is greater attrition of women from male-dominated occupations than one might have expected. A large proportion of women in men's occupations leave when they change occupations. By 1977, 50% of women who had been in male-dominated occupations in 1967 were employed in sex-neutral or female-dominated occupations. Among women who had changed occupations in this period, more than 80% who had been in male-dominated occupations in 1967 had left by 1977. These two processes – access and attrition – go hand in hand to produce circulation.

The proportion of women in male-dominated occupations can be increased by either reducing attrition or increasing access. The primary reason for the modest increases in the number of women in male-dominated occupations has been increased entrance in the past decade. The rate of attrition or exit has been quite constant. Public policy may have begun to have some impact by increasing women's access to male-dominated occupations. But once women gain entry to these occupations, working conditions may prevent them from staying there. Being hired is not enough if there are sufficient obstacles on the job to keep women from performing effectively and staying with the job. The data presented here suggest the urgent need to go beyond the opening up of hiring by working on discrimination on the job as well. Public policy may have to reduce the attrition of women from male-dominated occupations to reduce the level of sex segregation of occupations.

NOTES

1. Data are from the March 1981 *Current Population Survey*. See Jacobs (1983b, 1986b) for a more detailed examination of these data. Jacobs (1989) develops the issues explored in this chapter in greater depth.

2. The NLS data include a score for each three-digit occupation representing the 1970 percent female of the occupation. The 1970 sex composition of the 1960 Census occupational categories had to be estimated by mapping one set of categories onto the other (Priebe, Heinkel, and Greene, et al., 1972). For the March 1981 CPS data I assigned each three-digit occupation a percent female score based on 1970 Census data. The percent female scores generated from the 1970 Census data correlated quite highly with those generated from the 1981 CPS data itself ($r = .93$). Most of the deviation of this relationship from 1.0 is produced by occupations for which the CPS data have very few casts. If one restricts the analysis to occupations for which the CPS data have more than 10 cases, the correlation between 1970 Census scores and 1981 CPS scores is .97.

3. My use of the terms "stayers" and "movers" is based on a substantive distinction: whether individuals changed detailed categories in the period considered. This usage contrasts with the elimination of entries in the diagonal cells or the estimation of a class of "latent movers" (see e.g., Clogg, 1981). Whereas others eliminate *a priori* all diagonal-cell entries, I eliminate all entries that are *a priori* on the diagonal: One must be in the same sex-type category if one is in the same occupation.

4. The differences between the mobility table assuming 100% turnover and the table for movers only are due to (1) the exaggerated effect of the marginals on the movers table and (2) the nonrandom distribution of movers. The proportion of expected mobility for occupation changers between 1967 and 1977 is 62% for the three-category case.

5. This figure underrepresents the amount of occupational change in this period. It ignores exit from the labor force and ignores individuals who may have changed occupations and then changed back. Analyses not reported indicate that exit and reentry into the labor force do not change the process described here.

6. The difficulties with the NLS coding scheme are based on conversations with the staff of the Center for Human Resource Research at Ohio State University, which coordinates the NLS data. Coding error reduces the overall sex-type correlation but increases the correlation for the movers-only analysis by including some actual "stayers" as "movers."

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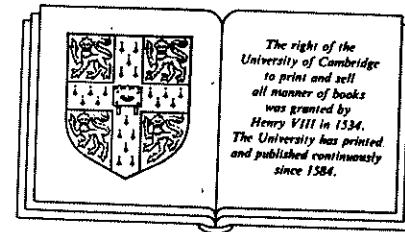
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