

TRENDS IN WORKPLACE CONTACT BETWEEN MEN AND WOMEN, 1971-1981

Jerry A. Jacobs

University of Pennsylvania

SSR, Volume 70, No.3, April, 1986

This paper offers evidence of asymmetric trends over the past decade in the workplace contacts between men and women in the United States. Although sex segregation declined during this period, women as a group have not experienced a noticeable increase in contact with men, in part due to their increased proportions at work. Men, on the other hand, see many more women at work than they might have in the past, due to declining segregation and increased presence of women in the workforce. This study demonstrates that probable inter-group contact is important to study, above and beyond the overall level of segregation.

This inquiry follows the lead of Lieberman and Carter (1982), who introduced an index of the probability of intergroup contact (P^*), a measure fruitfully employed in recent studies of residential segregation (Massey and Mullan, 1983). This index supplements the standard index of dissimilarity (Duncan and Duncan, 1955) by indicating the way segregation is experienced by each group. Two different settings with equal levels of segregation but different proportions of women will have different probabilities of contact, a feature of segregation revealed by P^* .

Another important feature of this measure is its potential for revealing asymmetries, as men's probability of contact with women is not necessarily equal to women's probability of contact with men. Thus P^* enables one to consider the possibility that change is not experienced equally by two groups. While occupational data do not precisely measure workplace contact, we may assume that trends in workplace contact parallel those at the occupational level, just as census tract trends generally parallel those found at the block level in studies of residential segregation (Taeuber and Taeuber, 1969).

The formula for P^* for women's contact with men occupations is

$$P^*_{WM} = \sum_{i=1}^j \frac{(W_i)(M_i)}{W T_i}$$

where W_i is the number of women in occupation i , M_i is the number of men in occupation i , W is the total number of women in the labor force, and T_i is the total number of men and women in occupation i , summed over j occupations.

We also employ an odds ratio measure to capture changes in segregation across major occupational categories. The odds ratio takes the sex ratio of each category over the sex ratio for the labor force as a whole for a given year. Thus the odds ratio indicates the degree of disproportion of women in a major occupational group-

ing. The odds ratio measure allows us to compare trends in the distribution of women across the major categories along with the dissimilarity measure of segregation within the categories. The combination of indices provides a richer examination of trends over time.

Data are from the May, 1971 and March, 1981 Current Population Surveys. Both have the same sampling methods and use the same 1970 Census detailed occupational coding scheme. The data collection procedures are described in a Bureau of Labor Statistics publication (1976).

Results. Multiple Measures of Trends in Sex Segregation. Table 1 charts trends in sex segregation for the entire labor force and for each of 10 major occupational categories. The CPS data, classified by 1970 Census detailed occupational categories, are presented in the first panel. For each year Table 1 presents the standard index of dissimilarity (D), women's probability of contact with men (P^*_{WM}), men's probability of contact with women (P^*_{MW}), the sex-ratio, and the odds ratio. The P^* statistics indicate the way this decline in sex segregation has been experienced by men and women at work. The indices of intergroup contact on Table 1 indicate that men and women experienced quite differently the declining occupational sex segregation. Between 1971 and 1981, men's probability of contact with women increased from .17 to .23, a rise from 1 in 6 to nearly 1 in 4. For women, the probability of contact with men stayed about the same ($P^*_{WM}=.28$ in 1971 and .29 in 1981).

These trends in intergroup contact are partly the result of declines in sex segregation and partly the result of increased labor force participation by women. As the percent of women in the labor force increased from 38 to 42 percent, men are more likely to come into contact with women, even with no decline in occupational sex segregation. Giving additional force to this trend is a decline in occupational segregation by sex (the index of dissimilarity declined from 69.5 to 63.0 during this period). For men, the increase in women's labor force participation and the decline in sex segregation both result in increased contact with women at work.

Women, however, did not experience a significant increase in the probability of contact with men. For women, the decline in sex segregation tended to increase contact with men, while the increasing proportions of women in the labor force increased their probability of contact with other women. These two developments offset one another in the 1970's, leaving women's overall probability of contact with men unchanged.

The P^* statistics thus reveal a striking asymmetry in recent trends. Men may feel women have made great strides, as women co-workers are significantly more evident to them. However, women are no more likely to have shared occupations with men than they were a decade earlier, perhaps reinforcing a feeling that little has changed.

Trends for the major occupational categories can be viewed with both the odds-ratio and the dissimilarity measures. Segregation between major categories is indicated by the odds ratio. Women managers, transport workers, laborers, and farmers grew in disproportionate numbers. The increases in female farm workers probably reflect increased reporting of labor force involvement by farm wives. The representation of women professionals and sales workers kept pace with the growth of women in the labor force. The proportion of women in the professions might well have increased had the numbers of teachers not declined. The number of women in craft, operative and service jobs increased more slowly than the growth of women in the workforce.

Within each of these major occupational categories, sex segregation declined, as measured by the index of dissimilarity. Thus clerical occupations are becoming more integrated internally even while the dominance of women in this occupational grouping increased. The difference between the distribution across major occupations and integration within major occupations is highlighted when these two measures are compared. Managerial, agricultural and service work moved toward more balanced sex-ratios, and became increasingly integrated internally as well.

Women's probability of contact with men (P^*WM) increased slightly in the professions, sales, farm and service occupations, as sex segregation in each declined. P^*WM declined for managers, clerical, craft, transport, and laborers, as the increase of women dominated the declines in sex segregation. Thus women in male bastions have increased contact with women. However, women in female-dominated occupations, such as clerical work, experienced only a slight increase in contact with men.

The second panel of Table 1 repeats this analysis for 1970 and 1980 Census data employing 1980 Census categories. The patterns generally follow those found for the CPS data with 1970 Census categories. Overall sex segregation is down 7.8 points, compared with 6.5 points for the CPS data. Women's probability of contact with men rose slightly for the Census data, but men's probability of contact with women rose by a greater amount. Trends in odds ratios are slightly different for the professions, sales, craft, and laborers, due to differences in definitions and sampling, but these differences are quite small. In all cases a small increase for one set of data becomes a small decline in the other

data set. Trends in dissimilarity are the same for both data, with the minor exception of transport workers. Trends in women's probability of contact with men are the same except for farmers and laborers. Trends in men's probability of contact with women are the same for all cases. Table 2 reports the probabilities of inter-group contact by age group, educational level and work effort, calculated with the CPS data. Data on the proportion female of each subgroup and the index of dissimilarity are also presented on Table 2. For the subgroups examined on Table 2, women's probability of contact with men depended on the rate of change in the level of sex-segregation and the change in the sex-composition of the group. Whenever women increased as a percentage of a labor force subgroup, men's probability of contact with women rose by more than women's probability of contact with men.

Men's probability of contact with women increased at each age level, for each but the youngest cohort, at each level of education and for all levels of work effort except part time. These exceptions are due to the decline in labor force participation of women in the youngest cohort as they entered the child-bearing years, and the growing proportion of men engaged in part-time work. For these two groups women's probability of contact with men rose while men's probability of contact with women fell. For all other groups, women's probability of contact with men rose by less than did men's probability of contact with women, and in several cases even declined.

Perhaps most striking is the change among the most educated group, where men's probability of contact with women increased from .19 to .43 as a result of more women with post-graduate degrees in the labor force and rapidly declining sex segregation among this group. The most educated women, on the other hand, experienced a decline in the probability of contact with men, (from .40 to .33), as the growing number of women had increasing opportunities to encounter other women at work.

Effects of Labor Force Composition. Smith and Ward (1984) have argued that the stability of women's wages relative to men's over the course of much of the century is the result of the declining relative quality of the female labor force. They indicate that the increased women's labor force participation has brought into the labor force women with less education and with fewer years of experience than the average working woman. They argue that this change in composition offsets the trend to increasing relative wages for women. The present analysis tests whether a similar process has inhibited declines in occupational segregation by sex over the 1970's.

Attributes to be examined include age, education, hours worked, and marital and family status. The first step in estimating the effects of

labor force composition on the sex segregation of occupations is the selection of appropriate categories across which segregation would be measured. The detailed census categories are too numerous to use in logit regression analysis, and the 10 major categories obscure too much segregation.

We consequently constructed a 20 category model which preserved over 90 percent of the segregation observed with the detailed-occupational model. Within each of the 10 major occupational categories, we grouped occupations into 3 categories: female-dominated occupations, sex-neutral occupations and male-dominated occupations. Female-dominated occupations included those with 70-100 percent women; sex-neutral occupations are those with between 30 and 70 percent women; and male-dominated occupations have fewer than 30 percent women.¹

This procedure produces fewer than 30 categories, since not all of the major occupational categories have detailed occupations which fill each cell. Additional collapsing eliminates several small categories, each involving less than 1 percent of the male and female labor force.²

The result is a 20 category model with an index of sex segregation of 59.3, 93.4 percent of the sex segregation present in the census detailed (3-digit) occupational data. For the 1971 data, the 20 category occupational model produces an index of segregation of 67.0, 96.7 percent of the detailed scheme. Thus the collapsed model does not significantly reduce the extent of segregation revealed for either point in time. This result is an extremely convenient one, in that it facilitates the pursuit of multivariate analysis.

For each of these 20 categories, we estimated the influence of labor-force characteristics on incumbency in occupational positions. After constructing a set of dummy variables, logit regression predicts the presence or absence of women in each category. Then the degree of sex segregation explained by these variables is measured by substituting the mean characteristics of men into the equation estimated for women. The extent of change between explained by these variables is estimated by substituting women's 1971 characteristics into the 1981 equations.

The regression equations include age, educational level, hours worked, and marital and family status. We constructed dummy variables for each category of these variables reported on Table 2 to account for non-linearities. In each case the lowest category served as the comparison category for each variable.

We calculated indices of dissimilarity for the 20-categories outlined above, controlling for the influence of age, education, hours worked, and marital and family status. As the presentation of coefficients for each of the 12 dummy variables for each of the 19 equations is unweildy, this analysis can be summarized by indicating the change in the index of segregation which would

result if men's and women's attributes for all these variables were equalized. Only a small proportion of sex segregation is accounted for by the demographic variables considered. In 1981, assigning to women the age, hours, and educational distributions of men would reduce the degree of segregation by just over 2 percent (58.0 vs. 59.3).

This conclusion is consistent with the modest influence of these variables obtained by England (1982) and Beller (1982a). This finding is in accord with a range of studies which suggest that the measured characteristics of women do not account for their concentration in female-dominated occupations. The influence of these variables is no more significant in explaining the change in sex segregation between 1971 and 1981. Changes in the attributes of the female labor force between 1971 and 1981 explain a change of less than 1 point in the index of dissimilarity. If one maintains the 1981 coefficients for women and substitutes the 1971 means characteristics of women in the labor force, the index of dissimilarity rises only slightly (D=60.1 vs. 59.3), indicating that the change in women's characteristics alone accounts for only a small portion of the modest changes during the 1970's. The balance of the decline reflects changes for individuals with similar labor force attributes.

Conclusion. This sheds light on the structure of occupational segregation by sex. The evidence on inter-group contact suggests the asymmetry in the experience of changes over the last decade. Although sex segregation has declined, women as a group have not experienced a significant increase in contact with men, in part due to the increased proportions of women at work. Men, on the other hand, see many more women at work than they have in the past, as a result of decreased segregation and increased presence of women in the workforce.

NOTES

1. These dividing lines are arbitrary, but other divisions do not produce significantly different results (Jacobs, 1983). The crucial element in this model is the inclusion of a sex-neutral category, one which is often omitted in work in this area.

2. The 1981 CPS sample included no individuals in female-dominated managerial, transportation or laborer occupations, reducing the total number of reduced categories to 27 from a possible 30. The sex-neutral and female-dominated portions of the craft and farm categories are joined with the male-dominated occupations in each respective field. The sex-neutral transport and laborer categories are also collapsed, and the female-dominated sales category is joined with the sex-neutral sales occupations.

REFERENCES

- Beller, Andrea. 1982. "Occupational segregation by sex: determinants and changes," *The Journal of Human Resources* 17: 371-92.
- Bureau of Labor Statistics, 1976 *Concepts and Methods used in Labor Forces Statistics Derived from the Current Population Survey*. Report 463, Series P-23, No. 62. Washington, D. C.: U. S. Government Printing Office.
- England, Paula. 1982. "The failure of human capital theory to explain occupational segregation," *Journal of Human Resources* 17.

Jacobs, Jerry A. 1983. *The Sex Segregation of Occupations and the Career Patterns of Women*. Ph.D dissertation, Department of Sociology, Harvard University.
 Lieberman, Stanley and Donna K. Carter. 1982. "Temporal changes and urban differences in residential segregation: a reconsideration" *American Journal of Sociology* 88 (September): 296-310.
 Smith, James P. and Michael P. Ward. 1984. *Women's Wages and*

Work in the Twentieth Century. Santa Monica: Rand Corporation.
 Taeuber, Karl and Alma Taeuber. 1969. *Negroes in Cities*. New York: Atheneum. Treiman, Donald J. and Heidi Hartman, eds., 1981. *Women, Work and Wages*. Washington, D. C.: National Academy of Sciences Press.

Manuscript received September 25, 1985, reviewed October 11, 1985.

Table 1. Trends in Sex Segregation by Major Occupational Category

A. Current Population Survey Data, 1971 vs. 1981*

	D		P*WM		P*MW		W/M		Odds Ratio	
	1971	1981	1971	1981	1971	1981	1971	1981	1971	1981
All	69.5	63.0	0.28	0.29	0.17	0.23	0.60	0.79	--	--
Professionals	62.9	55.2	0.30	0.32	0.21	0.28	0.69	0.86	1.15	1.09
Managers	27.1	23.9	0.77	0.56	0.16	0.34	0.20	0.61	0.33	0.77
Sales	57.5	49.9	0.38	0.39	0.27	0.33	0.70	0.86	1.17	1.09
Clerical	57.8	53.1	0.14	0.13	0.45	0.55	3.15	4.18	5.25	5.29
Craft	61.5	54.6	0.79	0.77	0.03	0.05	0.04	0.07	0.07	0.09
Operatives	49.6	45.6	0.41	0.41	0.25	0.29	0.60	0.71	1.00	0.90
Transport	58.4	57.0	0.82	0.69	0.04	0.07	0.04	0.09	0.07	0.11
Laborers	41.9	34.1	0.86	0.83	0.05	0.10	0.06	0.12	0.10	0.15
Farm	55.1	32.0	0.57	0.63	0.13	0.25	0.23	0.40	0.38	0.51
Service	67.0	59.6	0.17	0.22	0.28	0.37	1.65	1.70	2.75	2.15

B. Census Data, 1970 vs. 1980**

	D		P*WM		P*MW		W/M		Odds Ratio	
	1970	1980	1970	1980	1970	1980	1970	1980	1970	1980
All	67.6	59.8	0.29	0.32	0.18	0.24	0.61	0.73	--	--
Professionals	62.3	54.8	0.30	0.32	0.22	0.30	0.74	0.92	1.21	1.26
Managers	20.5	15.7	0.78	0.67	0.18	0.30	0.23	0.44	0.38	0.60
Sales	62.2	51.1	0.35	0.36	0.24	0.34	0.70	0.95	1.15	1.30
Clerical	56.9	55.8	0.16	0.15	0.45	0.52	2.72	3.37	4.46	5.52
Craft	57.2	59.8	0.63	0.62	0.05	0.04	0.07	0.07	0.13	0.10
Operatives	45.8	40.5	0.42	0.45	0.28	0.31	0.66	0.69	1.08	0.95
Transport	50.9	51.1	0.84	0.74	0.04	0.06	0.04	0.08	0.07	0.11
Laborers	49.3	38.7	0.58	0.62	0.12	0.15	0.21	0.25	0.34	0.34
Farm	38.0	30.9	0.82	0.77	0.08	0.13	0.10	0.18	0.16	0.34
Service	67.6	55.1	0.18	0.25	0.28	0.37	1.48	1.43	2.43	1.96

* 1970 Census Occupational Classification

** 1980 Census Occupational Classification

Table 2. Trends in the Sex Segregation of Occupations, 1971 and 1981, By Age, Cohort, and Education

Age	D			P*WM			P*MW			W/M		
	1971	1981	chn	1971	1981	chn	1971	1981	chn	1971	1981	chn
16-24	67.4	59.4	-8.0	0.27	0.31	+0.04	0.22	0.27	+0.05	0.82	0.92	+0.10
25-34	68.4	64.5	-3.9	0.32	0.32	0.00	0.16	0.21	+0.05	0.49	0.67	+0.18
35-44	66.9	62.7	-4.2	0.31	0.31	0.00	0.17	0.24	+0.07	0.56	0.79	+0.23
45-54	67.5	63.1	-4.4	0.30	0.31	+0.01	0.19	0.23	+0.04	0.61	0.75	+0.14
55-64	68.2	64.1	-4.1	0.31	0.33	+0.02	0.18	0.26	+0.08	0.56	0.79	+0.23
65+	64.1	63.2	-0.9	0.37	0.34	-0.03	0.17	0.22	+0.05	0.47	0.67	+0.20

Years of Schooling Completed

	D			P*WM			P*MW			W/M		
	1971	1981	chn	1971	1981	chn	1971	1981	chn	1971	1981	chn
1-11	68.7	62.7	-6.0	0.32	0.35	+0.03	0.16	0.20	+0.04	0.49	0.59	+0.10
12	65.6	62.9	-2.7	0.32	0.32	0.00	0.20	0.23	+0.03	0.61	0.72	+0.09
13-15	68.2	59.9	-8.3	0.27	0.29	+0.02	0.20	0.27	+0.07	0.72	0.96	+0.24
16	64.9	49.7	-15.2	0.32	0.38	+0.06	0.19	0.33	+0.14	0.56	0.85	+0.29
17+	61.5	42.0	-19.5	0.40	0.33	-0.07	0.19	0.43	+0.24	0.47	0.85	+0.38

Hours Worked

	D			P*WM			P*MW			W/M		
	1971	1981	chn	1971	1981	chn	1971	1981	chn	1971	1981	chn
1-29	69.4	62.6	-6.8	0.31	0.35	+0.04	0.21	0.20	-0.01	0.61	0.59	-0.02
30-39	62.4	60.8	-1.4	0.36	0.34	-0.02	0.21	0.22	+0.06	0.59	0.67	+0.08
40	64.7	62.1	-2.6	0.33	0.28	-0.05	0.20	0.25	+0.05	0.75	0.89	+0.14
41+	64.6	46.7	-17.9	0.47	0.49	+0.02	0.16	0.19	+0.06	0.27	0.39	+0.12