ABSTRACT
                An examination was made of what determined women's
opportunities to participate in the United States labor force from
1940 to 1978. Using a model drawn from ecological and competition
theory, the data examined suggest that the expansion of the economy,
the relative proportion of women in the population, female tertiary
education, and governmental involvement in the economy operate to
increase women's opportunities in the labor force. Unionization and
fertility operate to decrease women's opportunities. Empirical
results from time-series analysis indicate that most of these factors
are significant and have the predicted effects with the exception of
the nonsignificant effects of fertility. Also, some labor force
differences by female age groups are found. Directions for future
research should include the more direct specification of female and
male competition in the labor force and the suitability of this model
for cross-national analysis of female labor force participation.
(Author/KC)

A COMPETITIVE MODEL OF WOMEN'S LABOR

FORCE PARTICIPATION IN THE

UNITED STATES: 1940-1978*

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ABSTRACT

This paper examines the determinants of women's share of the labor
force in the United States from 1940 to 1978. Utilizing a model drawn
from ecological and competition theory, we propose that the expansion of
the economy, the relative proportion of women in the population, female
tertiary education, and governmental involvement in the economy operate
to increase women's share of the labor force; unionization and fertility
operate to decrease women's share. Empirical results from time-series
analysis indicate that most of these factors are significant and have
the predicted effects with the exception of the non-significant effects
of fertility. Also, some labor force differences by female age groups
are found. Directions for future research should include the more
direct specification of female and male competition in the labor force
and the suitability of this model for cross-national analysis of female
labor force participation.

A COMPETITIVE MODEL OF WOMEN'S LABOR FORCE PARTICIPATION
IN THE UNITED STATES: 1940-1978

This paper formulates and specifies an aggregate model of women's
relative share of the labor force from 1940 to 1978.   Previous research in
the area of women in the labor force has focused frequently on individual
level explanations of occupational attainment without attention to the
structural context within which attainment takes place (Treiman and
Terrell, 1975; Featherman and Hauser, 1976; McClendon, 1976).   Although
recent research has incorporated structural or contextual factors such as
labor markets and occupational segregation that may affect women's
participation in the labor force (Beck et al., 1978; Wolf and Fligstein,
1979; Parcel and Mueller, 1980; Rosenfeld, 1980; Ward and Mueller, 1982)
there have been few aggregate or longitudinal analyses of the broader
economic and social factors, e.g., economic expansion, state intervention,
and unionization, that determine women's relative share of the labor force
over time (for notable exceptions, see Oppenheimer, 1970; Snyder and Hudis,
1976).   Since the processes that determine aggregate levels of women's
share of the labor force may differ significantly from the determinants of
individual level attainment, it is important to develop a theoretical
framework to examine the overall structural processes of women's labor
participation that may intervene in the individual attainment process.

We propose that an appropriate theoretical formulation for the explana-
tion of women's relative share of the labor force over time can be derived
from ecological and competition theory (Hawley, 1950, 1968; Hannan and
Freeman, 1977).   Within this framework, jobs constitute resources in the

overall productive niche or the labor force. Over time, women and men are viewed as two segments of a population that are competing for access to and dominance over the limited labor force resources. The number of employment opportunities or resources per the competing populations in the productive niche determine the relative level of competition, i.e., where resources are scarce, there is greater competition. Where resources are increasing, then competition is less intense. As a result, we argue that the size of the productive niche relative to the adult population is a major determinant of women's greater access to labor force resources given past male dominance of the productive niche. At the same time, other factors affect the relative level of competition. For example, the larger relative numbers of a competing group in the labor force will provide an advantage, while constraints on competition can result from population characteristics such as fertility. Further, competition can be altered by populations acquiring advantageous attributes for competition like higher levels of education or by organizing in the workplace through labor unions. Finally, factors external to the productive niche such as state intervention in the economy can alter the competitive environment in favor of one group over another.

We briefly delineate a competitive model of women's labor force participation. Then this model is specified and hypotheses are tested through the use of data on women's share of the labor force from 1940 to 1978 and time series analysis.

A Competitive Model of Women's Labor Force Participation,

In this section we will articulate the concepts of competition theory which apply to our argument. Our approach focuses on the productive niche,

which we define as the economic structure of paid labor force opportunities, and on competition between segments of the population for resources within and control over the productive niche. Emphasis on the niche follows from the assumption that selection among competing groups is defined by the requirements and corresponding fitness of the relevant groups to existing environments (Hannan and Freeman, 1977). We propose that, over time, women's share of resources (relative to men) in the paid productive niche is a function of a competitive process and changes in the number of resources per the total population, group characteristics that may constrain competition, attributes for competition, i.e., education or organization, and factors external to the productive niche that may alter the environment or competition between groups.

Populations are said to occupy the same niche to the extent that they depend on identical environment resources. We consider income the direct resource, but income is largely dependent on access to jobs; thus, we define resources as jobs.

In general, a niche is defined as all those combinations of resource levels at which a given population can survive and reproduce itself (Hannan and Freeman, 1977). Obviously, human populations have resources other than jobs that provide sustenance but within a capitalist economy we assume that jobs have become the major resources for survival. For example, with the rise of industrial capitalism, there was a transfer of commodity production from the home into the marketplace, and the creation of the paid productive niche controlled by males. Resources that were produced within the home became defined as women's work and the resources in the marketplace (or paid labor) became primarily defined as men's work, in a new gender division of

labor (Benston, 1969; Young, 1981). Thus, the occupational structure and
the family became separate but interdependent niches within a single
environment, a paid productive niche outside the home dominated by males,
and an unpaid productive niche within the home occupied by females.[1]

Existing within the larger paid productive niche are a number of
realized niches in which a segment of population outcompetes other local
segments. An example of a realized niche within the overall labor force is
the occupational category of craftspersons where women have rarely had access
to these occupations. In terms of the issues at hand, it is clear that males
have dominated the direct income niche; that is, they have been able to out-
compete females for both the number of jobs and control over the more
desirable jobs (Snyder and Hudis, 1976, Hartmann, 1976). It is the long-
term increase in women's share of the labor force, despite past male domina-
tion of the productive niche, for which we seek an explanation.

Increasingly, over time labor that has previously been performed within
the home has been transferred to the market or the larger productive niche.
As more of women's use production within the home was transferred to the
market, women who performed these productive activities have changed the
location of their labor and moved into the paid labor force (Oppenheimer,
1970). A the same time, technological advances have resulted in an increase
in the number and types of jobs available--an increase in the diversity of
the paid productive niche. While some of the productive expansion was taken
over by men, in the long run many of the new jobs were taken over by women
seeking resources in the expanded production niche and, in some occupational
sectors, redefined as the female sectors.

Since men are unlikely to freely relinquish control over the existing resources, we argue that the expansion of the number of available opportunities for employment is a precondition to women's increased access to the labor force. Expansion can come about either as a simple increase in the number of jobs available in all occupational sectors relative to the total population, or as growth in selected industrial and occupational sectors allocated to females. We therefore hypothesize that:

(1) The size of the paid productive niche (or the number of employment opportunities relative to the adult population) will bring about an increase in women's share of the labor force relative to men.

An increase in women's share of the labor force is not a completely straightforward process, as we shall see. The availability of an economically active female population of sufficient size to compete for certain jobs, factors constraining the competitive abilities of the female population, and the nature of the change in particular productive processes all interact to impede women entering the market economy in the same linear fashion as their male predecessors.

Competition

Hannan and Freeman (1977) place emphasis on competition as a determinant of patterns of social organization. If competition is a primary determinant of the employment patterns of women relative to men, we should find that factors that directly affect competitive abilities will have significant effects on women's share of the labor force.

Competition becomes a factor in the allocation of job resources as a result of the limits imposed by the environment or the economy; resources

available to each competitor are finite and fixed. As resource limits are approached, competition between members of the same population can result in density-dependent effects that stabilize the population, or in other words, unemployment (Hawley, 1950). At the same time, competition between women and men has frequently resulted in the co-existence of the two groups in two different productive niches or through adaptation to the use of two diffe nt sets of resources (a consequence of competition mentioned by Hannan and Freeman [1977]). Hence, within the overall productive niche or within the labor force, females and males have co-existed by having access to different employment opportunities and by differentiating into separate but interdependent realized niches within the larger productive niche, al- though considerable overlap exists (Milkman, 1976; Blau, 1979). Additionally, many women have remained within the unpaid productive niche or within the home. To the extent that women and men co-exist in separate realized niches, women's employment may be relatively unaffected by fluctuations in the number of jobs available to the population. However, given the upper limit of actual employment opportunities relative to the adult population and men's dominance over access to the labor force, we hypothesize that:

(2) Higher levels of unemployment will lower women's share of employment (relative to men).

Ecological theory holds that patterns of resource use tend to be specialized toward segments of the population with distinct characteristics. Without suggesting arguments as to ultimate causes, the reproductive func- tion of females has, for both biological and social reasons, tied women more closely to the home. This biological characteristic has served to socially and economically distinguish the productive niches of women and men

(Eisenstein, 1979). To the extent that reproductive capacity distinguishes female and male competitors, the importance of this characteristic should be one determinant of the differences between the two segments of the population. Previous studies have shown that the social and economic roles allocated to women because of their reproductive capacity may lower women's labor force participation. On the other hand, research has shown that increased access to the labor force may lead to the reduction of fertility as women recognize the costs of childbearing to labor force careers (Standing, 1978; Kupinsky, 1980). Additionally, fertility and age may combine to provide differential labor force patterns between older and younger women. Oppenheimer (1970) found that the demand for female labor in the 1950s was met by older women due to the decrease in younger female labor force which was busily engaged in childbearing activities. More recently, with the increasing growth of the labor force and demand for female labor, researchers have noted that the younger female cohorts' patterns of participation despite childbearing have become similar to that of males (Kreps and Clark, 1976). Given the recent reduction in birthrates and the rationalization of childbearing activities in the United States, the biological constraints on women should be reduced. In the long run, while these two factors may be mutually reinforcing, we hypothesize that:

(3) Fertility will operate as a greater constraint on younger women's competitive abilities in contrast with the competitive abilities of older women.

(3a) Lower fertility rates will increase the labor force share of women.

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Thus, with the reduction (but not elimination) of constraints unique to females and with alterations of the pattern of resource availability of the respective paid and unpaid productive niches, we should expect to find females increasingly adopting the roles associated with the more favored male jobs. Women's movement into the productive niche does not always result in competition with men. To the extent that women have a distinct set of resources within the productive niche such as highly sex-segregated occupations, they can co-exist with the dominant segment of the population without directly engaging in competition. Ultimately, the limiting resource in competition is the number of available jobs relative to the number of adults in the population or the continuing expansion of the productive niche. When the carrying capacity of the productive niche is reached, a gain by one group is predicted to be matched by a loss on the part of the other group. There are, however, various other factors that define the unique characteristics of the competing groups and that may alter either the environment or constraints on the competing groups before the carrying capacity of the productive niche is reached: population size, positive attributes for competition such as education and organization, and external forces or the state.

Population Size. In competition, a major factor determining the dominance of one group by another is the relative supply of competitors between the two groups. While men dominate the productive niche at all times, in periods of decrease in the available male population, e.g., war, the participation of females will increase.[2] Assuming that larger group size establishes a higher probability of control over access to employment, and assuming that a relative decrease in the male population may open spaces in

the productive niche to women, we hypothesize that:

> (4) The greater the proportion or supply of women in a
> population, the greater their relative share of the
> labor force.

Education. Access to educational attributes can determine an indi-
vidual's competitive abilities and in the case of individual women, educa-
tion is one of the major determinants of women's labor force participation
(Bowen and Finegan, 1969; Treiman and Terrell, 1975; Featherman and Hauser,
1976; McClendon, 1976). At the population level, the distribution of edu-
cational resources between groups can determine a group's abilities to ef-
fectively compete for resources in the labor force (Weiss et al. 1976).
Since the overall growth in female occupations and labor force was a func-
tion of the demand for educated female labor (Oppenheimer, 1970), then we
hypothesize that:

> (5) An increase in female education at the tertiary level will
> lead to an increase in women's share of the labor force
> (relative to men).

Organization. Organizations can be used to protect a position of domi-
nance or to better compete for a position of dominance in the productive
niche. The effects of unions as organizations operating to protect the
positions of workers are positive and significant. Weiss (1979) found that
unions have a positive effect on the income of the working class in the
United States. At the same time, unions have protected the position of
certain groups of workers. Bonacich (1972) has argued that split labor
markets emerged in part through unionization to favor white workers over
black workers. With regard to women, Hartmann (1976) documents the

historical instances of trade union efforts to exclude women from the labor force, both by keeping women out of unions and through urging the passage of protective legislation. In more contemporary times, women are still underrepresented in union membership. For example, women constitute only 25 percent of the membership and 7 percent of the leadership positions in the AFL-CIO (Wertheimer, 1979). To the extent that the labor force is organized into unions, then, we argue that:

> (6) An increase in the proportion of the labor force in unions
>   will negatively affect the labor force share of women.

State. There are factors external to the productive niche that can alter the environment of the niche or reduce the salience of the unique constraints of a given population segment for competition in that niche. In terms of ocial organization, the state represents an external factor that can alter the environment. Previous research has shown that a more corporate state can have positive effects on women's share of the labor force by mobilizing female workers through equal opportunity legislation and hiring practices (Weiss et al., 1976). Additionally, strong states, in terms of government revenues, can stimulate economic expansion which is a precondition to women's increased employment (Ward, 1982). State expenditures on childcare facilities and training programs can diminish the salience of women's unique constraints in the labor force (Baxandall, 1980; U.S. Commission on Civil Rights, 1981). Therefore, we hypothesize that:

> (7) Greater governmental involvement in the productive niche
>   will increase women's share of the labor force.

In summary, we have formulated a model of women's relative share of the labor force in the United States. This model assumes that women and men

compete for access to job resources. While economic expansion constitutes
a precondition for increased access of women to the labor force, the competi-
tive process can be affected by the unique constraints on and attributes of
the competing female and male groups as well as the relative supply of
workers within the population segments and the role of external structures
such as the state. Furthermore, these relationships may vary on the basis
of the age-distribution of females. The next section includes the data,
methods, and analysis utilized for testing the hypotheses derived from this
model.

Methods

Data

Our sample utilizes annual aggregate level data from the United States
for the time period 1940 to 1978. This period includes several significant
shifts in the female labor force--mobilization for World War II, demobiliza-
tion during the 1950s, and then labor force growth during the 1960s and
1970s.

Dependent Variables

The variables used in the analyses are gathered from a variety of sta-
tistical yearbooks (for data sources see Appendix A). Two types of
dependent variables are used to represent women's access to and location
within the paid productive niche: measures of women's access to the total
labor force and women's actual employment in the civilian labor force.
First, the overall female share of the labor force dependent variable is
constructed by dividing the adult female labor force (aged 15-64) by the
total adult labor force (WLF1564). Then specific age group variables are
constructed by dividing the female labor force population aged 25 to 44 and

45 to 64 years by the adult labor force (WLF2544 and WLF4564). These three
indicators include both employed and unemployed persons and data are available
from 1940 to 1978. Second, a measure of women's share of the employed
civilian labor force from 1947 to 1978 is computed by dividing the number
of employed adult women by the total number of adults in the employed
civilian labor force (WECLF); data by age are unavailable. Hence, these two
sets of indicators distinguish between women drawn into the labor force and
women's share of actual employment.

In regard to trends in these dependent variables over time, women's
overall share of the labor force was 25 percent in 1940 and then rose to
approximately 30 percent in 1945; a decline in women's share occurred from
1946 until 1954 when women's share once again reached World War II levels.
From the mid 1950s on, women's share of the labor force increased monotonically
to approximately 41 percent in 1978. Younger women's share of the labor
force was 12 percent in 1942 and rose to 13 percent in 1957. Thereafter
a slight decline of younger women's share took place until 1970 when a
monotonic increase began and younger women's share of the labor force was
18 percent in 1978. Older women's share of the labor force was 5 percent
in 1942 and increased steadily until 1971 when older women constituted
approximately 13 percent of the labor force. Soon after, older women's
share began to decline and their share was only 11 percent in 1978. These
patterns can be contrasted with women's share of the employed civilian
labor force which was 28 percent in 1947 and has increased steadily until
1978 when women's share was 44 percent.

Independent Variables

From the same labor force sources, we constructed the size of the pro-
ductive niche variable (NICHE) or the total labor force aged 15 to 64
divided by the total adult population. This particular measure indicates
the number of persons in the labor force relative to the adult population;
both employed and unemployed persons are included in this indicator. In a
similar manner, the number of employed persons in the civilian labor force
relative to the adult population is constructed (CLFNICHE). The influence
of unemployment on women's actual employment is measured by the unemployment
rate (UNR).

Other theoretically relevant variables are constructed as follows: the
female population size variables are computed by dividing the female popula-
tions aged 15-64, 25-44, and 45-64 by the total population aged 15-64
(FPOP1564, FPOP2544, FPOP4564). These variables represent the relative
female share of the adult population. State strength (GOVREV) is measured
by dividing government revenues by the gross national product. The extent
of workers' organizations within the productive niche is operationalized as
the percent of the nonagricultural labor force that is unionized (UNION).
Constraints and attributes for women's labor force competition are repre-
sented by two variables. The general fertility rate for each year is used
as an indicator of the childbearing constraint (FERT). A major attribute
for competition is women's relative share of tertiary education (TERTED).
We constructed this variable by dividing the number of bachelors degrees
granted to women by the total number of bachelors degrees. Thus, these two
indicators of the relative level of childbearing constraints and women's
access to valued educational resources.

Model and Methods

Theoretically, we have specified certain causal processes leading to
the determination of women's relative share of the labor force over time.
In this situation, time series analysis is the appropriate form of analysis.
Since we do not anticipate these processes to be a function of instantaneous
causation in that the effects of the size of labor force, unions, fertility,
and education should affect women's access to the labor force over a time
span of at least a year, lagged effects from the independent variables on
the dependent variables are used in analysis. Hence, our major causal
relationships for the three female groups and the female employed civilian
labor force can be specified in the following equations:

(1) $WLF1564_t = a + b_1 NICHE_{t-1} + b_2 POP1564_{t-1} + b_3 UNION_{t-1} + b_4 FERT_{t-1} + b_5 GOVREV_{t-1} + b_6 TERTED_{t-5} + V_t$

(2) $WLF2544_t = a + b_1 NICHE_{t-1} + b_2 POP2544_{t-1} + b_3 UNION_{t-1} + b_4 FERT_{t-1} + b_5 GOVREV_{t-1} + b_6 TERTED_{t-5} + U_t$

(3) $WLF4564_t = a + b_1 NICHE_{t-1} + b_2 POP4564_{t-1} + b_3 UNION_{t-1} + b_4 FERT_{t-1} + b_5 GOVREV_{t-1} + b_6 TERTED_{t-5} + W_t$

(4) $ECLF1564_t = a + b_1 CLFNICHE_{t-1} + b_2 UNR + b_3 POP1564_{t-1} + b_4 UNION_{t-1} + b_4 FERT_{t-1} + Z_t$

Means, standard deviations, and correlations for all variables are presented
in Table 1.

The female civilian labor force equation includes a measure of unemploy-
ment to examine the effects of overall unemployment on women's actual employ-
ment. Due to a low number of cases, measures of the state and education are
omitted from initial analysis of the female CLF equation.

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A major problem in OLS time series analysis is serial correlation of error terms, especially if the model is misspecified. Important variables excluded from the analysis may cause the error terms to be serially correlated. This problem can lead to a loss of efficiency in estimates and lowered reliability. One way to correct for auto or serial correlation is through the use of generalized least squares (GLS) where the variables are transformed by generalized differencing. Thus, if the Durbin-Watson test indicated serial correlation, then p was estimated and the regression equations were reestimated (Kmenta, 1971; Ostrom, 1978).

Results

Women Aged 15-64

The OLS unstandardized regression coefficients, standard deviations, coefficients of determination, and Durbin-Watson statistics are presented in Table 2. In equation 1, the niche size, population, union, and fertility variables are entered, followed by the state in equation 2, and tertiary female education in equation 3. For the overall female share of the labor force, the specified model works well; all variables are significant and operate in the predicted direction with the exception of the education and fertility variables. The Durbin-Watson statistic indicates the absence of serial correlation (see Table 2, equations 1-3). The major determinant of women's labor force share is the relative size of the female population where a 1 percent change in the female population results in a 6.7 percent change in the female share of the labor force. The size of the productive niche has a positive influence (.7%) that is counteracted by the negative effect of unions (-.4%). In equation 2 we can see that when state strength

is included in the equation, this variable has a positive effect on women's labor force share. At the same time, the negative influence of unions (-.6%) increases and the effect of niche size (.6%) declines.

The nonsignificant influence of the general fertility rate is rather puzzling in light of previous research. In this situation there is a problem with multicollinearity: the zero-order correlation of fertility with unionization is .78 (see Table 1).[3] The union measure is, however, more highly correlated with the dependent variable and this relationship may account for the nonsignificant influence of fertility. We reestimated the model omitting the fertility measure. In analyses not reported here, the omission of the fertility measure results only in slight upward changes in the remaining coefficients.[4] We conclude, therefore, that on the aggregate level, and controlling for other factors, this measure of fertility has a nonsignificant impact on women's share of the labor force. This finding suggests also that fertility net of other factors may be decreasing in importance as a constraint on women's competitive abilities.

The lack of significant effects from the education variable as observed in equation 3 is interesting. We tried a number of different lags, with no apparent success. Two possible explanations are: (1) this particular measure is not tapping the influence of education on women's share of the labor force, or (2) there are non-significant tertiary effects.[5] Of the latter explanation, perhaps changes in women's share of tertiary education over time have not operated to increase women's share of the labor force or to provide a competitive advantage vis-a-vis men (Sorkin, 1973).

Women Aged 25-44

The processes determining the labor force share of younger women are relatively similar to the model for all women; however, this model specification has less predictive power (see Table 3). In the OLS equation, the Durbin-Watson statistics indicate the presence of serial correlation, so the regression equations were reestimated using GLS techniques and assuming a first-order autoregressive process ($\hat{p}$ is provided in the Durbin-Watson column—Ostrom, 1978). The labor force niche has a stable and positive influence on younger women's labor force share across all three equations; a percent change in the labor force results in a .2 percent change in younger women's share (equation 2). Unionization has a consistently negative influence where women's share declines at -.4 percent. The relative size of the younger female population has a nonsignificant effect in the first GLS equation and when state strength is included, the population size variable only approaches significance.. The state variable operates to raise younger women's share of the labor force (.3 percent).

Once again, fertility and the female share of education variables are not significant. For fertility, this finding appears to be a function of multicollinearity, where the union and population variables are more highly correlated with the dependent variable than is fertility.[6] As to the lack of effects from education, this particular measure has only a slight correlation with younger women's labor force share ($r = -.009$). Tertiary education does not enhance the competitive abilities of this age group. Further, the number of younger women in the population has a nonsignificant effect on younger women's share of the labor force. Obviously, other important

determinants of younger women's share of the labor force remain to be specified. In particular, for future research marital status could be another group characteristic that is related to fertility but mediates the supply of young women workers. The proportion of married versus single women may constrain the number of women who are able to compete (Oppenheimer, 1970).

Women Aged 45-64

The significant determinants of older women's share of the labor force differ somewhat from the models of all and younger women. Since the Durbin-Watson statistics allow us to reject the null hypothesis of zero autocorrelation in equations 1 and 2, GLS estimates will be discussed for the first two equations and OLS estimates for equation 3 (see Table 4). The notable differences for older women include the nonsignificant influence of the state and the positive influence of tertiary education. Concurrently, the size of the productive niche effects, albeit positive and significant, are less than for all and younger women (.07 versus .56 and .21). Unionization and population have the predicted effects that were also smaller than those of the other two groups. Finally, fertility has a nonsignificant influence. Here, the explanation is not multicollinearity but rather a small correlation with older women's labor force share ($r = -.13$).

The explanation for these findings is not readily apparent. The positive influence of education appears to be a statistical artifact, where a small zero-order relationship becomes positive in a multivariate context (Gordon, 1968). The relationship between the state and older women's labor force share, while weaker than in the case of all women, is mediated by the

high relationship between older women's population and the state variables. Finally, the negligible influence of fertility was predicted in our hypotheses; but an alternative expectation might be that the fertility rate would operate to increase older women's share of the labor force, especially if fertility was acting as a constraint on younger women's participation. This process is not taking place.

In general, older women's share of the labor force is strongly determined by the relative size of this age group followed by unionization and the labor force niche. As to the influence of the niche compared with the results for all and younger women, we must conclude that the size of the productive niche and other factors have played a less important role than would be expected. One reason for these differences might include earlier patterns of labor force participation that precluded older women's participation and favored younger women's participation, i.e., the demand for young and single female workers with less obsolete skills. At the same time, the specified model works moderately well, for all three age groups with some variations on the basis of age. Further specification of the younger and older women's models is needed: the influence of marital status on women's competitive abilities warrants additional investigation.

Women's Share of the Employed Civilian Labor Force

In order to examine women's share of the employed civilian labor force, a new set of equations is estimated. The results of regressing women's share of the employed labor force on the employed niche unemployment, population, union, and fertility variables are shown in Table 5, equation 1.[7] The Durbin-Watson statistics indicate the presence of serial correlation;

thus the GLS estimates are discussed. First, the size of the employed niche and unionization variables have significant effects that are in the predicted direction. The unemployment variable, however, has a positive effect on women's share of employment in contradiction to earlier expectations that women lose access to employment during periods of high unemployment. Finally, the popoulation and fertility variables have non-significant effects on women's share of employment.

The non-significant effects of fertility and population size are due to the multicollinearity problems cited earlier; in particular, the population size has a correlation of .87 with the niche variable. Hence, the basic equation is reestimated without the population variable while adding the education variable. The OLS and GLS estimates for these equations are shown in Table 5, equation 2.[8] The GLS results indicate that fertility has a significant negative effect on women's share of employment and that unionization retains its negative effects. Other variables operate in the predicted manner; however, education is significant but negative indicating that the number of degrees granted to women has small negative effects on women's employment.

The positive effects of unemployment on women's share of the labor force merit further attention. According to Hawley (1950), the unemployment rate is a proxy for the carrying capacity of the environment. Hence, from ecological theory, we might expect that women would be excluded from the labor force during periods of employment. The positive effects of unemployment, however, indicate that women's share of employment has continued to increase despite high levels of unemployment. These results, therefore, reflect a situation where women and men compete only indirectly for

employment--a relationship that confirms other research on women's employ-
ment during economic crises (Milkman, 1976).

In contrast with the results for the women's share of the labor force
equations, women's share of the employed civilian labor force is more
strongly determined by the size of the employed niche, unemployment,
unionization, education, and fertility. With the omission of the state
strength and population variables, fertility has a negative effect on
women's employment. Thus, the determinants of women's actual employment
differ somewhat from women's access to the labor force (as both employed and
unemployed workers).

Discussion

In evaluating these results in light of the theoretical model set
forth, there are three points for consideration: (1) the relative ef-
fectiveness of the theoretical model, (2) the influence of long-term struc-
tural processes on women's share of the labor force, and (3) directions for
future research. First, at a basic level, the measurement model explains
women's access to the labor force over time; a slightly modified model
explains women's share of employment in the civilian labor force. We know
that the size of the labor force, the relative number of women in the popu-
lation, and governmental involvement in the economy all operate to raise
women's access to the labor force while unionization operates to lower
women's access. At the same time, the size of the employed niche and unem-
ployment increase women's share of actual employment; unionization, fer-
tility, and education lower women's share. We suggest that these results,
in accordance with the hypotheses derived from ecological theory, provide

partial empirical support for the theoretical model and for utilizing an ecological framework in analyzing the problem area of women and the labor force. As to the unsuccessful results with the fertility and education measures in the women's share of the labor force equations, research and alternative operationalizations need to be undertaken. These results suggest, however, that over time, fertility, in terms of women's access to the labor force, may operate less as a constraint and that women's share of tertiary education may not be a significant attribute.

Second, the model and empirical results suggest that researchers in the area of women and the labor force need to look at how long-term structural and competitive processes affect women's economic participation relative to men. In particular, the influence of economic expansion, unemployment, the growth of female specific sectors, and the role of the state should be incorporated into theoretical considerations and analyses. The role of unions in perpetuating a gender division of labor should also be investigated.

Third, obviously this model requires further articulation and specification. A better measure of the supply of women workers relative to men is needed; perhaps a better measure would be the number of single and married women. Other points of concern should include a more specific examination of the actual extent of niche overlap between women and men in the labor force. Given the extreme degree of occupation segregation of women in the overall labor force and the positive effects of unemployment (Blau, 1978), we need to specify the particular realized niches or occupational categories where women and men actually compete, e.g., female and male managers

(Weiss et al., 1976), or where the relative proportion of women approaches parity.' Until sufficient longitudinal data are available, the question of niche overlap over time may be difficult to resolve: occupational statistics by sex are available by year only after 1953. Currently, the idea of competition and niche overlap can be utilized in ongoing studies of firm and worker characteristics (for example, see Blau, 1977).

An additional consideration for future research is the utility of this model for other nation-states and, in particular, for developed versus less developed nation-states. This topic is addressed by Ward (1982). The results from this research indicate that the role and structure of the economy within the context of the world economic system are important factors in the cross-national determination of women's share of the overall labor force and specific industrial sectors.

FOOTNOTES

[1]Milkman (1976) has noted that in past periods of economic crises, women's use production within the home was expected to compensate for any hardship caused by male unemployment. With the extensive expropriation of women's use production into the marketplace, families may be unable to rely on women's increased use production during economic crises. Hence, we make the argument that jobs have now become the major resource for survival for both women and men in advanced capitalist economies. Additionally, given the growing number of female headed families in the United States, many women do not depend on a male head of household to provide the total income for the family.

[2]The idea of the supply of male versus female workers may be more relevant in cross-national analyses utilizing countries that sustained substantial losses of the male population during war time. However, the argument is still made that the larger number of women in the population or by age group should have a positive effect on women's competition for access to the labor force.

[3]This high relationship is due to the situation in the 1950s where fertility was increasing while the percent of the unionized labor force was decreasing.

[4]When the effects of fertility are estimated while omitting the unionization variable, the fertility effects are significant and negative. However, the size of the productive niche variable becomes larger along with the effects of population; the state becomes nonsignificant.

[5]The nonsignificant effects could be due to the relationship among women's education, labor force participation, and husband's income where although women's education leads to greater labor force participation, this participation declines with husband's income.

[6]The effects of fertility on women's share of the labor force without controlling for unionization are also nonsignificant.

[7]The state and education variables are not included in the initial equations due to the low number of cases.

[8]In analyses not reported here, the state has nonsignificant effects on women's share of the employed civilian labor force while controlling for the employed civilian labor force, unemployment, and either unionization or fertility.

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Table 1

Correlations, Means, and Standard Deviations*

Variables	WLF 1564	WLF 2544	WLF 4564	WECLF	POPF 1564	POPF 2564	POPF 4564	NICHE	EMP NICHE	FERT	UNION	GOVREV	TERTED	UNR
WLF1564[a]	1.00													
WLF2544[a]	.829	1.00												
WLF4564[a]	.791	.446	1.00											
WECLF[b]	.990	.847	.719	1.00										
POPF1564[b]	.868	.589	.923	.814	1.00									
POPF2544[b]	-.847	-.548	-.685	-.861	-.677	1.00								
POPF4564[b]	.717	.297	.977	.512	.911	-.531	1.00							
NICHE[b]	.714	.640	.349	.928	.500	-.494	.402	1.00						
EMPNICHE[b]	.826	.752	.776	.847	.869	-.538	.750	.548	1.00					
FERT[b]	-.496	-.624	-.131	-.847	-.148	.713	.149	-.369	-.168	1.00				
UNION[b]	-.680	-.661	-.484	-.941	.423	.818	-.208	-.277	-.395	.782	1.00			
GOVREV[b]	.403	.172	.287	.142	.487	-.164	.519	.571	.446	.154	.294	1.00		
TERTED[c]	-.128	-.009	-.373	-.122	-.230	.002	-.394	-.206	-.123	-.293	-.085	-.104	1.00	
UNR[b]	-.159	.362	.249	.480	-.220	-.067	-.292	-.486	.313	-.316	-.399	-.740	.000	1.00
Mean	.325	.135	.101	.346	.505	.217	.162	.665	.602	.097	.299	.171	.395	.054
S.d.	.043	.013	.022	.042	.004	.015	.011	.020	.023	.018	.032	.039	.071	.031
N. of Cases	39	37	37	32	39	39	39	39	38	39	39	39	38	38

*Definition of variables (also described in the text):

WLF1564, WLF2544, WLF4564: female labor force (by age) divided by adult labor force aged 15-64

Table 1 (cont.)

WECLF: female employed civilian labor force divided by adult employed civilian labor force
POPF1564, POPF2544, POPF4564: female population (by age) divided by adult population
NICHE: total adult labor force divided by total adult population
EMPNICHE: total adult employed civilian labor force divided by adult population
FERT: general fertility rate
UNION: percent of nonagricultural labor force that is unionized
GOVREV: government revenues divided by Gross National Product
TERTED: bachelors degrees granted to females divided by total bachelors degrees
UNR: unemployment rate

[a]Measured at time 1.

[b]Measured at time minus 1.

[c]Measured at time minus 5.

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Table 2

Labor Force Share of Women Aged 15-64: OLS Regression Estimates[a]

Variables	OLS	OLS	OLS
	Equation 1	Equation 2	Equation 3
NICHE	.7064* (.0963)	.5657* (.1027)	.5694* (.1115)
UNION	-.4265* (.0905)	-.6456* (.1161)	-.6001* (.1211)
POP1564	6.7972* (.5894	5.4462* (.7370)	5.764* (.7671)
FERT	-.0937 (.1570)	.0465 (.1539)	.0487 (.1633)
GOVREV		.1945* (.0720)	.1669* (.0748)
TERTED			.0154 (.0228)
INTR	-3.441	-2.6465	-2.8249
R^2	.9600	.9673	.9659
N	39	39	38
Durbin-Watson	1.87	1.92	2.06
MSE	.00008	.00007	.00007

[a]Variables defined in Table 1.

*Significant, $p < .05$.

Table 3

Labor Force Share of Women Aged 25-44:
OLS and GLS Regression Estimates[a]

Variables	OLS	GLS	OLS	GLS	OLS	GLS
	Equation 1		Equation 2		Equation 3	
NICHE	.3637* (.0974)	.2290* (.0609)	.2066* (.0885)	.2230* (.0839)	.1953 (.1027)	.1980* (.0843)
UNION	-.2909* (.0903)	-.2094* (.0549)	-.6096* (.1073)	-.3642* (.0831)	-.5490* (.1257)	-.2910* (.0855)
POP2544	.3146* (.1880)	.0174 (.2159)	.8529* (.2023)	.3889 (.1979)	.7402* (.2392)	.2324 (.2102)
FERT	-.0344 (.1397)	.0098 (.1357)	-.0229 (.1144)	-.0553 (.1314)	-.0194* (.1415)	-.0335 (.1408)
GOVREV			.2670* (.0652)	.1243* (.0527)	.2416* (.0717)	.0953 (.0515)
TERTED					.0006 (.0208)	.0028 (.0214)
INTR	-.0838	.0416	-.0485	-.0042	-.0310	.0258
R^2	.6331	.4975	.7620	.6589	.6753	.5674
N	37	36	37	36	36	35
Durbin-Watson	.2540	.777[b]	1.013	.4789[b]	.835	.5220[b]
MSE	.00007	.00001	.00004	.00002	.00005	.00002

[a]Variables defined in Table 1.

[b]Autocorrelation coefficient.

*Significant, $p < .05$.

Table 4

Labor Force Share of Women Aged 45-64: OLS and GLS Regression Estimates[a]

Variables	OLS	GLS	OLS	GLS	OLS	GLS
	Equation 1		Equation 2		Equation 3	
NICHE	.0827*	.0797*	.0739*	.0739*	.0888*	.0876*
	(.0278)	(.0305)	(.0289)	(.0317)	(.0290)	(.0295)
UNION	-.0973*	-.0925*	-.1259*	-.1101*	-.0855*	-.0836*
	(.0235)	(.0256)	(.0353)	(.0346)	(.0348)	(.0349)
POP4564	2.1064*	2.1104*	2.0518*	2.077*	2.1682*	2.1710*
	(.0536)	(.0638)	(.0734)	(.0771)	(.0742)	(.0750)
FERT	-.0220	-.0300	.0149	-.0082	-.0052	-.0087
	(.0467)	(.0522)	(.0576)	(.0584)	(.0555)	(.0557)
GOVREV			.0241	.0151	-.0005	-.0012
			(.0223)	(.0224)	(.0212)	(.0212)
TERTED					.0143*	.0141*
					(.0060)	(.0062)
INTR	-.2671	-.2665	-.2516	-.2567	-.2922	-.2919
R^2	.9904	.9845	.9907	.9868	.9932	.9928
N	37	36	37	37	36	35
Durbin-Watson	1.34	.265[b]	1.51	.200	1.81	.035[b]
MSE	.000005	.000004	.000005	.000004	.000004	.000004

[a]Variables defined in Table 1.

[b]Autocorrelation coefficient.

*Significant, $p < .05$.

Table 5

Women's Share of the Employed Civilian Labor Force: OLS and GLS Regression Estimates[a]

Variables	OLS	GLS	OLS	GLS
	Equation 1		Equation 2	
CLFNICHE	.7375*	.6792*	.6506*	.5989*
	(.2921)	(.2984)	(.1798)	(.1939)
UNR	.5940*	.6481*	.5634*	.6088*
	(.1692)	(.1881)	(.1175)	(.1362)
UNION	-.5454*	-.5828*	-.6499*	-.6000*
	(.2042)	(.2071)	(.1227)	(.1503)
POPF1564	2.8773	1.0315		
	(1.7227)	(1.4342)		
FERT	-.2032	-.3396	-.4946*	-.5881*
	(.2523)	(.2716)	(.1817)	(.2069)
TERTED			-.1157*	-.1168*
			(.0203)	(.0247)
INTR	-1.4068	-.4143	.2106	.2347
R^2	.9386	.8976	.9703	.9425
N	31	31	31	31
Durbin-Watson	1.1161	.397[b]	1.0876	.4218[b]
MSE	.0001	.00008	.00005	.00004

[a]Variables defined in Table 1.

[b]Autocorrelation coefficient.

* Significant, $p < .05$.

APPENDIX A

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