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The Employment Status of Army Spouses

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Research Triangle Institute

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for

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The Army Family Research Program (AFRP) is a 5-year integrated research program that supports the Chief of Staff of the Army (CSA) White Paper 1983: The Army Family and The Army Family Action Plans (1984-1990) by developing databases, models, program evaluation technologies, and policy options that assist the Army to retain quality soldiers, improve soldier and unit readiness, and increase family adaptation to Army life. This report investigates the employment status of Army spouses, especially wives, who are in the civilian labor force or seeking to enter the labor force. It (1) describes labor force participation, employment, and earnings of military spouses relative to demographically similar civilians; (2) describes labor force participation, employment, and underemployment (i.e., not using training, experience, and skills on the job) of Army spouses; and (3) describes factors that lead to Army spouse satisfaction with military life. ─────

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19. ABSTRACT (Continued)

⌐──── ⁷ Unique factors related to military spouse work outcomes were identified through a review and analysis of the literature on the economic model of labor supply for married women and previous empirical research based on civilian women. ⌐⟨ ⟩ ⟨──

Descriptive statistics were used to portray the employment status and characteristics of Army spouses. Multivariate regression techniques were used to test hypotheses related to the determinants of labor force participation, employment, underemployment, earnings, and satisfaction with military life for spouses. An analysis was conducted to compare military wives and their civilian counterparts that systematically examines the determinants of labor supply, employment, and earnings. Army wives were examined in a separate analysis to determine the effects of individual characteristics and Army policy variables on labor force outcomes. The effect of employment and Army policy variables on spouse satisfaction with military life was also analyzed.

Military spouses were found to be less likely to work than civilian wives. Those who do work earn approximately the same amount as civilian wives, after controlling for other individual and household differences. Other characteristics of military wives that were seen to contribute to higher unemployment rates and lower earnings include geographic location, younger ages, and younger children.

Spouse employment programs, a longer time at the same location, more education, and CONUS locations are found to increase the likelihood that an Army wife will work.

Unemployment and the frequency of Permanent Change of Station (PCS) moves are found to be significant and negative factors of spouse satisfaction with military life. Child care services on post, satisfaction with proximity to population centers, and husband's income are seen to increase spouse satisfaction with military life.

The research results have important implications for Army policy and programs. Spouse employment programs aimed at increasing employment opportunities for unemployed Army wives, particularly following relocation, would be expected to significantly increase spouse satisfaction with military life and perhaps have a positive effect on retention. Policies that decrease the number and frequency of relocations over the career of the military husband may also improve spouse labor force participation and satisfaction with military life. A policy or program designed to increase the job skills and education of Army wives would be expected to increase employment opportunities for spouses, especially for spouses of junior enlisted personnel.

The Army sponsor for this effort, the Army Community and Family Support Center (CFSC), reviewed and approved an earlier draft of this report. Their comments indicate that the contents of this report on spouse employment will be useful in revising Army programs and policies.

ACKNOWLEDGMENTS

THE EMPLOYMENT STATUS OF ARMY SPOUSES

EXECUTIVE SUMMARY

Requirement:

To support the <u>Family Action Plans</u> (1984-1990) by investigating the employment status of Army spouses, especially wives, who are in the civilian labor force or seeking to enter the labor force by (1) describing labor force participation, employment, and earnings of military spouses relative to demographically similar civilians; (2) describing labor force participation, employment, and underemployment (i.e., not using training, knowledge, and skills on the job) of Army spouses; and (3) describing factors which lead to Army spouse satisfaction with the military way of life.

Procedure:

Unique factors related to military spouse work outcomes were identified through a review and analysis of the literature on the economic model of labor supply for married women and previous empirical research based on civilian women. Discussions with Army spouses and administrative personnel were conducted to develop further hypotheses.

Descriptive statistics were used to portray the employment status and characteristics of Army spouses. Multivariate regression techniques were used to test hypotheses related to the determinants of labor force participation, employment, underemployment, earnings, and satisfaction with military life for spouses. An analysis was conducted to compare military wives and their civilian counterparts that systematically examines the determinants of labor supply, employment and earnings. Army wives were examined in a separate analysis to determine the effects of individual characteristics and Army policy variables on labor force outcomes. The effect of employment and Army policy variables on spouse satisfaction with military life was also analyzed.

Findings:

Military spouses were found to be less likely to participate in the labor force and more likely to be unemployed than comparable civilian wives. The results also suggest that military wives do not earn significantly different wage rates or annual income compared to civilian wives, after controlling for other individual and household differences. Other characteristics of military wives which are significantly different from those of civilian wives were seen to contribute to observed lower participation rates, higher unemployment

rates, and lower earnings. In particular, geographic location, younger ages and younger children of military wives appear to be important factors of observed work outcome differentials relative to civilian wives.

The presence of spouse employment programs, increases in the length of time at the same location, increases in education, and CONUS locations are found to increase the likelihood that an Army wife will participate in the labor force. The length of time spent at the same location is also found to increase the likelihood that an Army wife will be employed.

Being unemployed and the frequency of Permanent Change of Station (PCS) moves are found to be significant and negative factors of spouse's satisfaction with the military way of life. Child care services located on post, satisfaction with proximity to population centers, and husband's income are seen to increase the spouse's satisfaction with military life. The results have important implications for retention and readiness to the extent that spouse satisfaction influences these outcomes.

Utilization of Findings:

The results based on secondary analyses have important implications for current Army policy and programs. Programs designed to identify job opportunities and increase placement of Army wives, particularly following a relocation to a new area, are clearly suggested by the results of the research. Moreover, spouse employment programs specifically aimed at increasing employment opportunities for unemployed Army wives would be expected to significantly increase spouse satisfaction with military life, and perhaps to have a positive effect on retention. Policies that decrease the number and frequency of relocations over the career of the military husband may also improve spouse labor force participation, employment and satisfaction with the military way of life. In addition, a policy or program designed to increase the job skills and education of Army wives would be expected to increase employment opportunities for spouses, especially for spouses of junior enlisted personnel.

The Army sponsor for this effort, the U.S. Army Community and Family Support Center (CFSC), reviewed and approved an earlier draft of this report. Their comments indicate that the contents of the report will be useful in revising Army programs and policies.

THE EMPLOYMENT STATUS OF ARMY SPOUSES

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THE EMPLOYMENT STATUS OF ARMY SPOUSES

Introduction and Overview

The Army Family Research Program

The Army Family Research Program (AFRP) is a long-range program of
integrated research activities designed to answer key policy questions about
Army families and the Army mission. This research program, sponsored by the
U.S. Army Community and Family Support Center, is being conducted by the U.S.
Army Research Institute for the Behavioral and Social Sciences (ARI) with the
assistance of a contract research consortium of Research Triangle Institute
(RTI), Caliber Associates, and the Human Resources Research Organization
(HumRRO).

The program is designed to address the major research issues in The Army
Family Action Plan I (Office of the Deputy Chief of Staff for Personnel, U.S.
Army, 1984) and assist Army policy and program personnel in designing future
policies and programs that both strengthen families and contribute to
retention and readiness. The purpose of the research is to produce input to
improved programs, policies, and practices that yield: (1) increases in the
strength and wellness of Army families; (2) enhanced spouse employment
opportunities; (3) improved retention of qualified personnel; (4) increased
soldier and unit readiness; and (5) a sense among soldiers and their families
of identity with and participation in Army community life.

Spouse employment is thought to be an important factor in the soldier's
commitment to military life, job performance, military readiness, and the
retention of enlisted personnel and officers. The importance that the Army
places on spouse employment and its expected relationship to readiness and
retention is clearly indicated in the White Paper 1983: The Army Family
(Chief of Staff, U.S. Army, 1983) and the Army Family Action Plan I (Office of
the Deputy Chief of Staff for Personnel, U.S. Army, 1984). There is a concern
that if being in the Army limits a spouse's ability to pursue satisfactory
employment opportunities then there will be a significant negative effect on
both readiness and retention.

In addition, the Army has recognized the importance of spouse employment as
an independent issue. Since the 1980 Army Family symposium, spouse employment
has become a primary target for policy and program development because of the
concern that Army life can create special problems for families in which the
wife needs or wants employment and career opportunities.

Because of these concerns the Army has initiated a series of policies and
programs directed towards the enhancement and facilitation of spouse
employment. In particular, employment programs are being implemented with the
intent of assisting spouses in obtaining satisfactory employment. One-stop
employment information centers, for example, are found on a number of bases,
with over a hundred scheduled to be opened by 1990.

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Research Objectives and Approach

Some research and considerable anecdotal evidence suggests that military spouses have a great deal of difficulty in finding and maintaining adequate employment and in building careers (Research Triangle Institute, in preparation).[1] These difficulties appear to have significant negative impacts on retention of their soldier spouses, and may have negative impacts on soldier readiness and on other career decisions as well. The overall purpose of this research is to learn why Army spouses have employment and career difficulties, how these difficulties affect the Army, and to use this knowledge to improve employment/career outlook for Army spouses. Figure 1 presents an overview of the conceptual model which guides the research.

The focus of the research presented in this report is on the impact of military life on employment and earnings of military spouses (wives) and how these outcomes are related to the spouses' satisfaction with military life. The approach used in this investigation takes into account Army factors that are hypothesized to affect spouse employment which, in turn, is expected to influence spouse satisfaction with military life. Spouse satisfaction is important for the Army because the underlying policy issue is the effect of spouse employment on soldier retention. The approach is to evaluate an index of spouse satisfaction as an indirect way of addressing this issue. Ongoing research for the Army Family Research Program is investigating approaches which more directly address the relationship of spouse employment, spouse satisfaction, and soldier retention.

The overall approach of the research includes a review of the relevant literature, interviews with policy makers and experts on spouse employment (Braddy, in preparation), and analyses of existing data sets. Specifically, the research approach is the following:

o   A review of the literature of labor supply models of married women and the economics of the family. An analysis of how these general models can be extended to include the special case of the military wife. Interviews and focus groups served as exploratory discussions to help identify potential factors which differentiate the military wife in the labor market.

o   An analysis of census data compares military wives and their civilian counterparts and systematically examines the determinants of labor supply, employment and earnings. The analysis serves to reveal underlying characteristics which account for much of the observed differences in work outcomes between military and civilian wives.

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[1]Throughout this report the term "spouse" refers exclusively to a wife. "Military spouse" refers to the wife of a member of _any_ of the military branches, "Army spouse" refers exclusively to a wife of a member of the Army, and "civilian" spouse refers to the wife of an individual who is not in the military.

o   Department of Defense (DoD) data are used to examine the
    characteristics of Army spouses and Army policy variables which
    determine labor force participation, employment, full-time employment,
    and underemployment (i.e., not using training, experience, or skills on
    the job). The analysis suggests certain policies may effectively
    increase participation and employment of Army spouses.
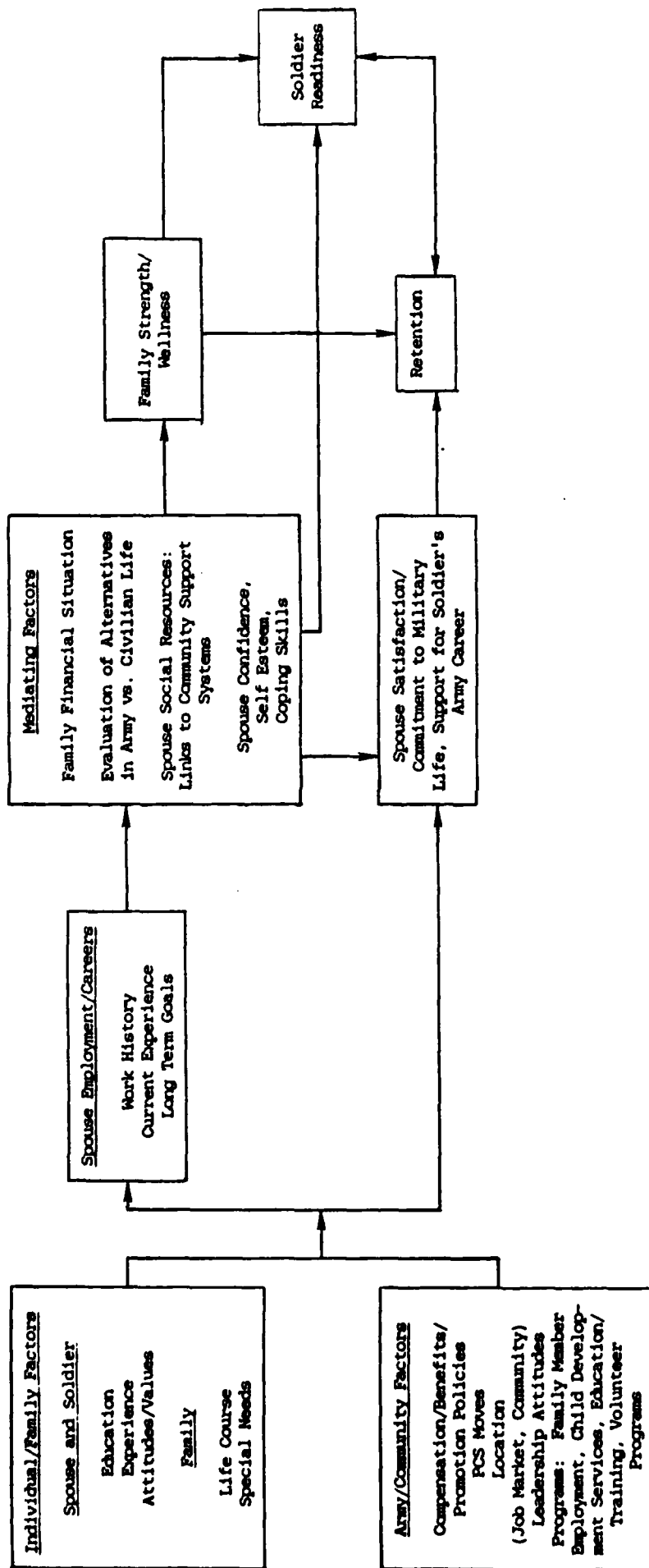
Figure 1. Spouse employment: conceptual framework for research

The following describes the boxes and flow of the figure:

Individual/Family Factors

Spouse and Soldier

Education
Experience
Attitudes/Values

Family

Life Course
Special Needs

Army/Community Factors

Compensation/Benefits/
Promotion Policies
PCS Moves
Location
(Job Market, Community)
Leadership Attitudes
Programs: Family Member
Employment, Child Develop-
ment Services, Education/
Training, Volunteer
Programs

Spouse Employment/Careers

Work History
Current Experience
Long Term Goals

Mediating Factors

Family Financial Situation

Evaluation of Alternatives
in Army vs. Civilian Life

Spouse Social Resources:
Links to Community Support
Systems

Spouse Confidence,
Self Esteem,
Coping Skills

**Spouse Satisfaction/
Commitment to Military
Life, Support for Soldier's
Army Career**

**Family Strength/
Wellness**

**Soldier
Readiness**

Retention

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o   The determinants of the spouse's satisfaction with military life,
    including employment status, are examined in an analysis of DoD data
    for Army wives. The results suggest that employment status is an
    important correlate of satisfaction with Army life and has important
    implications for retention and readiness.

o   Exploratory discussions were conducted with Army spouses and
    administrators to delineate reasons for working, barriers to
    unemployment, education and training needs, and perceived effects of
    spouse employment on readiness, retention, and family wellness. The
    qualitative information gathered from these discussions is valuable
    for generating hypotheses, formulating survey questions, and providing
    support for findings derived from quantitative data. The details of
    the methodology employed in and the results obtained from the
    exploratory discussions are contained in a separate report (Braddy, in
    preparation).

Background, Approach, and Data

In this section we review the economics literature which focuses on the labor supply of married women and the economics of the family, and describe how these general models can be extended to include the special case of the military wife. The conceptual framework used for much of the secondary analysis is based on the economic model of married women's participation in the labor force. Within this context, there are unique factors that are likely to be related to differences in work outcomes for military wives. The research presented in the later sections of this report contributes to the literature by incorporating the influence of the husband's being in the military on labor force outcomes of the wife. While there is a large literature on female labor force participation and earnings, there has been no previous systematic research which focuses on the military wife. Also presented is a conceptual framework which links labor force outcomes to spouse (wife) satisfaction with the military way of life.

Following the review of the literature and description of the theoretical framework, paragraphs are devoted to describing the empirical methods used in the analyses, including the probit model, selectivity correction, instrumental variables and simulations. The remaining paragraphs in this section are devoted to a description of the data bases used for the secondary analyses.

Background and Theoretical Framework

The original framework for the analysis of women's participation in the labor force was developed by Mincer (1962), and in it he expanded the labor supply model with the notion that the wage rate influences the allocation of time between work in the market and work in the home. Becker (1965, 1975, 1985) further expanded the individual labor supply model to include the family as the decision making unit.

Household Production

The household production approach hypothesizes a utility maximizing household which decides whether the wife will be in the labor force by examining her market wage rate relative to the value of her time spent at home (her reservation wage). According to the model, if time spent working at a job away from home more than compensates her for time lost in home production then she will choose to work in the market labor force, all other factors held constant.

The outcome of the household utility maximization process is that the choice of whether the wife will participate in the labor force will be determined by her market wage, her reservation wage, and personal tastes and preferences. It has generally been found in empirical investigations of the civilian labor force that the wife's labor supply is positively associated with her market wage rate and negatively associated with her husband's income (Mincer, 1962; O'Neill, 1985). One interpretation of the result found for husband's income is that the husband and wife are substitutes in home production and, as the opportunity cost of the husband spending time at home increases (i.e. as his market wage increases), the wife substitutes for him in

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the household (works less). An alternative explanation is that in households with high family income, both from the husband's labor income and other non-labor income, the financial need for the wife to work is decreased.

These results have important implications if they hold for Army wives. Previous research suggests that Army wives with low reservation wage rates and those married to husbands with low incomes (e.g., low ranking enlisted men) will be more likely to be in the labor force. An important question addressed by the research presented in this report is the extent that these women have difficulty in finding jobs, given their husbands are in the military. The ability of Army wives to find appropriate employment may be an important factor of satisfaction with the military way of life, commitment to the military, and ultimately retention.

Human Capital

Just as capital equipment or machines contribute to an individual's productivity, the possession of a skill, a body of knowledge, or valuable experience can make an individual more productive. The wage rate associated with a particular job, therefore, should reflect the costs of obtaining the education or training required to productively perform the job. Human capital theory suggests that education and experience are important determinants of the potential market wage (Becker, 1975; Mincer, 1962; Schultz, 1960). In empirical models which examine earnings, education and experience are used as proxies for productivity and are consistently found to be statistically significant determinants.[2]

The woman's number of years of education is expected to have a positive effect on wages and labor force participation. In the absence of complete work histories, the woman's age is used as a proxy for experience, and its squared value is also included in the analysis. A concave relationship between age and labor force participation is consistent with human capital theory and suggests that labor force participation increases with age up to some point, and then declines. A similar relationship between age and employment, and age and earnings, is also well established in the literature. An alternative specification for experience is to include a proxy variable which measures potential years of experience as a function of age and education, and its squared value. Because military wives generally are younger than civilian wives, it is expected that younger age contributes to lower labor force participation rates, higher unemployment, and lower wages than their civilian counterparts.

There is a substantial literature which deals with the question of why men's and women's wage rates differ (Becker, 1985; Corcoran & Duncan, 1979; Mincer & Polchek, 1974; Oaxaca, 1973; Polachek, 1975). Some authors argue that women earn lower wages than men simply because they have less human capital because they make a rational decision to invest less in themselves.

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[2]Thorough reviews of the theory and empirical research of the human capital approach are given in Mincer (1970) and Rosen (1977).

One of the purposes of the research presented in the next section is to determine whether the earnings of military wives are significantly different than comparable civilian wives and, if so, the factors which account for the difference. The human capital literature and wage gap research are helpful in this regard. Corcoran and Duncan (1979), for example, investigated the wage gap between men and women controlling for human capital characteristics including education, years of experience, training, years out of the labor force and other factors pertinent to career success in order to determine if wage discrimination was present. The research serves to emphasize the need to control for possible differences in human capital between civilian and Army wives to determine if having a husband in the Army, per se, has an effect on the wife's earnings.

Employment Interruptions

Previous research on the effects of interrupted careers also has implications for Army wives. While most of the research has focused on male/female differences, another question to be answered is whether wives of husbands in the military, who are likely to move more often (and thereby interrupt the wife's work pattern), are at a significantly greater disadvantage in the labor market than similar civilian wives. The literature suggests that it is important to include the factors which may influence whether the work experience of wives is interrupted in the analysis of work outcomes and wages. These factors include the number and ages of children and the frequency of location changes.

The household production model considers an individual to be productive in both the home and a market job, and the decision to work outside the home is dependent on these relative productivities. It is often assumed that when young children are present, the economic value to the family of having the wife remain in the home increases. As a result, many married women may interrupt their careers at this time. As children grow older, women may resume their careers. The wife's reservation wage, a measure of the value of her time spent in home production, is likely to be influenced by whether or not there are children in the household, and particularly by the age of the youngest child. A household which faces day care costs for pre-school aged children may find the net income contributed by a working wife too small (perhaps even negative) for it to be worthwhile. These demographic factors for households with young children are expected to increase the reservation wage and decrease the likelihood that wives in these households will be in the labor force. The presence of pre-schoolers may also influence whether a woman is employed, as well. Women may be less likely to be employed if their work hours are constrained by available day care hours. With respect to wage rates, children may negatively influence a woman's earnings to the extent that she is willing to accept a lower paying job in order to accommodate day care hours, or perhaps to be more conveniently located to a day care center. Because military wives are younger than civilian wives, they are more likely to have younger aged children, and so this factor may also contribute to lower

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participation, employment, and earnings of military wives relative to civilian wives.[3]

Whether "human capital depreciation" occurs when career interruptions take place has been a subject of controversy in the labor economics literature. Interruption of a work career may reduce earnings potential. The controversy has centered around whether real wages at re-entry are lower than wages at the time of labor force withdrawal. Mincer and Ofek (1982), for example, find that real wages are lower at re-entry and that the decline increases with the length of the interruption. Corcoran, Duncan, and Ponza (1983) on the other hand, find that interruptions reduce wages because work experience was not being accumulated, but do not find an additional penalty due to skills depreciation.

Mincer and Ofek (1982) also find rapid growth in wages after re-entry into the labor force. This rebound effect is interpreted as the "reconstruction" or "repair" of human capital which is assumed to be less costly than the new construction of human capital. After the pre-interruption wage level is restored, they find that the earnings profile of returners was the same as those who did not interrupt their career. Other results of the research suggest that interruptions associated with migration caused larger wage depreciation than interruptions without migration.

The frequency of interruptions due to migration may be a particularly important determinant of a military wife's earnings because of the number of Permanent Change of Station (PCS) moves made over the course of a military career. In addition, a change in location often requires an adjustment period and search time to find new employment, so it is expected that a move is negatively associated with labor force participation and employment.

Occupational Choice

The choice of occupation has been used to examine gender differences in earnings (Blau & Hendricks, 1979), and has implications for research which examines the differences between civilian and military wives.

Polachek (1981) argues that the differences in human capital is sufficient to explain gender differences in occupational distribution. England (1982) and Beller (1982), however, argue that discrimination is the underlying cause of occupational sex differences. Although there is agreement that occupational segregation contributes to wage differentials, the basis of the wage discrimination is not well established. The research suggests that it is important to control for differences in occupations when examining the determinants of work outcomes and earnings.

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[3]Schultz (1980) questions the interpretation of labor supply estimates containing family composition variables which are themselves the result of previous household decisions. A recent examination of the issue by Mroz (1987), however, indicates that there is no evidence that including family composition variables in labor supply estimations biases the results.

Spatial/Location Factors

Due to the relatively frequent permanent change of station (PCS) moves experienced by Army wives, the location of the assignment may be a particularly important determinant of both whether they are employed and their earnings potential. In general, military wives select their location conditional on their husband's location and are likely to be out of the labor force or unemployed directly following a PCS move. Thus, the decision to participate in the labor force as well as the decision of where to work is conditioned on the husband's job location for the majority of Army wives. In contrast, civilian households may have considerably more freedom to choose a location where the husband and wife jointly maximize employment opportunities.

Previous research (Lillydahl & Singell, 1985) suggests that there is a negative relationship between the distance to jobs and labor force participation for women. Research on work place and residential location suggests that women tend to earn less, work shorter hours, and commute less than men (Madden, 1981).

We expect that military wives may be worse off than their civilian counterparts because they are likely to choose their location conditional on the husband's location, and the labor market opportunities near military installations may not be as good as for most civilian wives. In addition, military wives located at installations outside the U.S. usually have limited employment opportunities.

The geographic location of the household is an important factor of labor market demand and is expected to be a determinant of work outcomes for married women. Poor labor demand conditions are likely to contribute to lower observed participation rates, employment, and earnings. Labor market demand may be a particularly important factor for military wives, many of whom are forced to be located near relatively isolated military bases. In general, women who are away from large population centers are likely to have lower participation rates (as discouraged workers), higher unemployment, and lower wages.

Discrimination

Much of the discrimination literature focuses on male-female wage differentials. However, the notion may be extended to military-civilian discrimination and suggests that there may be discrimination against military wives which may be related to the frequency of relocation. Because military wives are likely to be forced to move more frequently than civilian wives, it may be the case that employers are less likely to hire them, or pay them as well, as applicants who are more likely to stay in the area.[4]

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[4]In this research, discrimination in hiring is defined as a lower likelihood of a military wife being employed after controlling for differences in the characteristics of military and civilian wives. Discrimination in earnings is defined as lower wage rates or lower annual earned income of military wives after controlling for differences in the characteristics of military and civilian wives.

In order to test empirically for discrimination, wives with the same objective characteristics (education, experience, age, etc.) must be compared. Although many investigations have controlled for these characteristics in an attempt to explain gender wage differentials, most explain less than half of the variation in wages.[5] It may be difficult to sort out discrimination against military wives because of the confounding effects of relocation. For example, there is probably some period of time for adjustment to new surroundings and search time required to identify potential employers which is likely to have a negative influence on the likelihood of employment and, because of the interruption in work, a negative influence on wages.

Other Factors

Other socioeconomic and demographic factors may have direct effects on participation, employment, and earnings of married women. For example, women with husbands who earn low incomes are expected to be more likely to be in the labor force, all else equal. If military incomes are lower than civilian incomes for comparable married men, this may contribute to higher labor force participation of military wives. Other characteristics, including the ethnic background of the household and the civilian husband's occupation, may be useful as proxies for individual and household tastes and preferences for whether the wife is in the labor force.

Other characteristics of households, including whether the husband is an officer or enlisted man may also be useful as proxies for individual and household tastes and preferences in certain work outcome models. In addition, in a model of underemployment the spouse's motivations for working (economic need or to gain experience) may be an important determinant of whether she uses her acquired skills in her job.

Finally, and perhaps most importantly for the analysis of Army wives, Army policy factors which are likely to influence the spouse's work outcome directly should be included in work outcome models. An example is whether the woman is at a location that has an on-post spouse employment service. This policy variable may be used to examine the effectiveness of such services for labor force participation, employment and underemployment of Army wives. Other policy variables, already discussed, include the length of time that the household has been at the location (i.e., a policy related to the frequency of PCS moves), whether the assigned location is inside or outside the continental U.S. (CONUS or OCONUS), and the presence of child care services.

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[5]See Treiman and Hartmann (1981) for a review.

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Links to Satisfaction with Military Life and Soldier Readiness and Retention

Spouse employment is thought to be an important factor in a soldier's commitment to military life, job performance, military readiness, and the retention of enlisted personnel and officers, but no systematic research supports this assertion (Research Triangle Institute, in preparation). In this research the determinants of an intermediate outcome, spouse satisfaction with military life, are examined under the hypothesis that work outcomes may influence spouse support for the husband's military career. Figure 2 serves to clarify the conceptual framework for the analysis.

Individual, family and Army factors are hypothesized to affect spouse employment which, in turn, is expected to influence spouse satisfaction with military life. In addition to indirect effects of these factors which operate through spouse employment, these factors are also hypothesized to have a direct effect on satisfaction. An example of an indirect effect is frequent PCS moves which may have a negative effect on spouse employment because of search time required to find a new job following relocation, and being unemployed may lead to dissatisfaction with military life. Frequent PCS moves also may directly influence satisfaction, independent of whether moves cause unemployment. Relocations cause disruptions and require adjustment to new surroundings, finding housing, placing children in schools, locating suitable child care, etc. and may directly lead to dissatisfaction with military life. The empirical method used to estimate these relationships accounts for both the indirect and direct effects of the determinants of satisfaction, and is discussed in the following paragraphs.

Empirical Methods

For the comparison between military and civilian spouses, three models are separately estimated for married women: (1) labor force participation, (2) employment, and (3) earnings. For the analysis of Army wives, five models are separately estimated: (1) labor force participation, (2) employment, (3) full-time employment, (4) underemployment, and (5) satisfaction with military life.

A summary of the models, empirical methods, and the data used in the analyses is presented in Table 1.

The empirical approach used to model labor force participation is to estimate a reduced-form labor supply model, including variables related to the wife's potential market wage and her reservation wage, plus a set of other socioeconomic and demographic factors. Variables that are positively correlated with the potential market wage should increase the likelihood of labor force participation. Those that are positively correlated with the reservation wage should decrease the likelihood of participation. Similar expectations hold for the model of whether the woman is employed, and whether the woman works full-time.

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┌─────────────────────────────┐        ┌─────────────────────────────┐
│   Individual/Family Factors │        │        Army Factors         │
│             Age             │        │          Location           │
│          Education          │        │ Spouse Employment Programs  │
│      Family Composition     │        │     Child Care Programs     │
│          Experience         │        │                             │
└─────────────────────────────┘        └─────────────────────────────┘
           │     │                              │      │
           │     │      ┌───────────────────────┘      │
           │     │      │        ┌──────────────────────┘
           │     └──────┼────────┼──┐
           │            │        │  │
           │    ┌───────┴────────┴─┐│
           │    │ Spouse Employment ││
           │    └─────────┬─────────┘│
           │              │          │
    ┌──────┴──────────────┼──────────┴───┐
    │  Spouse Satisfaction with Military Life │
    └─────────────────────┬────────────────┘
                          │
          ┌───────────────┴─────────────────┐
          │  Soldier Readiness and Retention │
          └─────────────────────────────────┘
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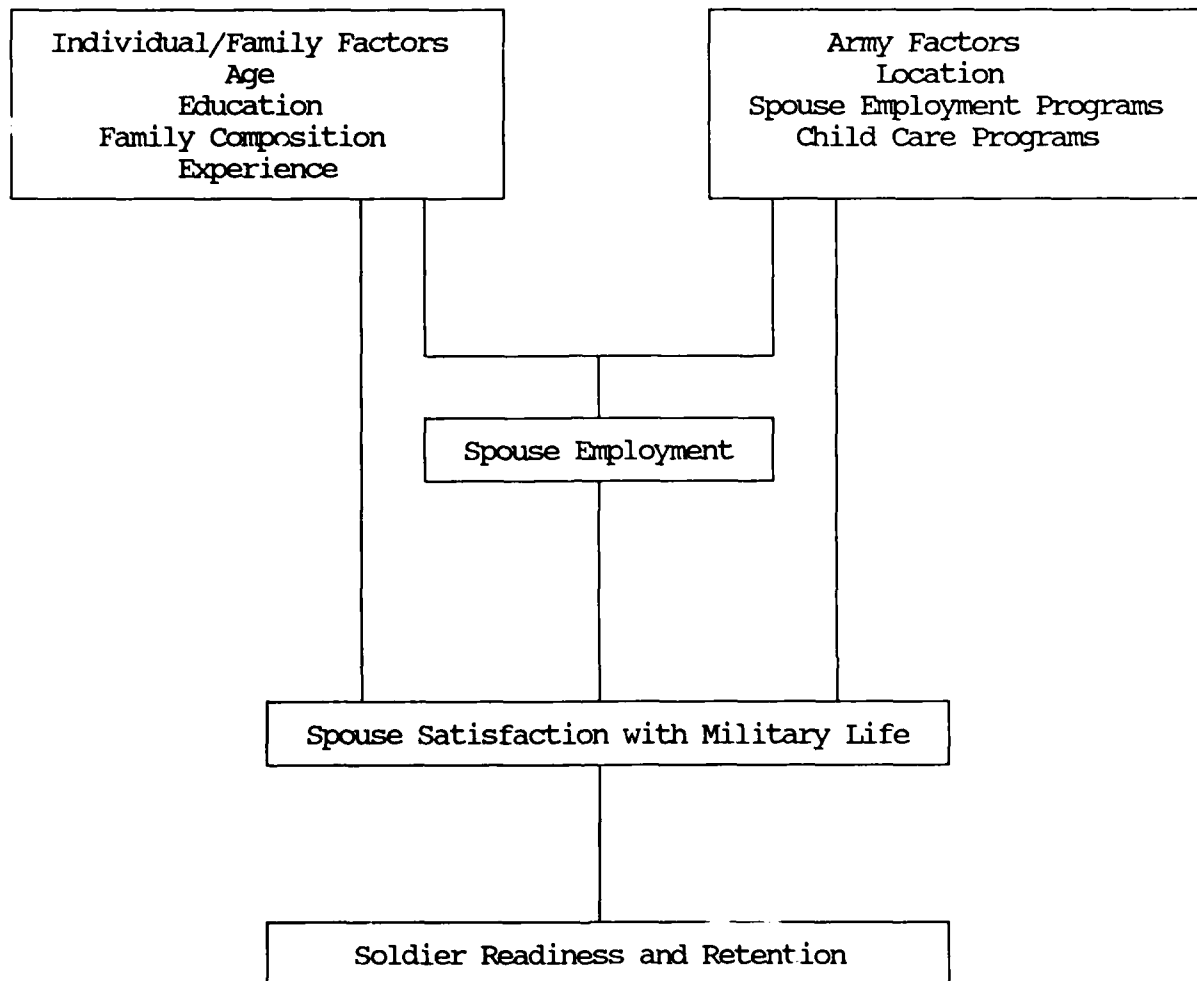
Figure 2. Hypothesized Relationship between Individual and Family Factors, Family Factors, Spouse Employment, Spouse Satisfaction, and Soldier Readiness and Retention

Table 1

Models, Methods, and Data

Model	Method(s)	Data
Labor Force Participation	Probit	o Current Population Survey 1985 DoD Surveys
Employment	Probit	o Current Population Survey
		o 1985 DoD Surveys
Full-Time Employment	Probit	o 1985 DoD Surveys
Underemployment	Probit	o 1985 DoD Surveys
Earnings	o Probit Selectivity Correction o OLS	o Current Population Survey
Satisfaction with Military Life	o Instrumental Variables o OLS	o 1985 DoD Surveys

Probit Method

The dependent variables for whether a married woman is in the labor force, whether she is employed, whether she works full-time, whether she uses her skills in her job, and whether she is satisfied with military life are defined as dichotomous variables. An appropriate statistical method for estimating the relationships for each model is the probit technique.[6] For example, the following probit equation was estimated for labor force participation of married women for the comparison between military and civilian wives:

$$P_i = X_i \, \beta_i + \epsilon_i \tag{1}$$

where: $P_i = 1$ if the woman was in the labor force, $P_i = 0$ if the woman was not in the labor force, β_i are the parameters to be estimated, ϵ_i is the error term, and X_i are the independent explanatory variables including such factors as age, education, ethnicity, husband's income, husband's occupation, household composition variables, change in location, geographic location, and whether the woman's husband is in the military.

A similar probit equation for whether the woman is employed is specified. For those wives who are in the labor force, the model examines the determinants of the probability that they are employed. The intent of the model is to examine the determinants of being employed for married women in households who desire that the woman works in the paid labor force. Thus, women who are not in the labor force are excluded from the model. We are not interested in estimating the probability of a randomly selected married woman being employed, especially for those households who have decided that the wife is not in the labor force. Therefore, a selectivity correction to condition the model estimation on the likelihood that a woman is in the labor force is inappropriate, because we are not interested in making inferences about the employability of women who have chosen not to work. We are particularly interested in the effect of spouse employment programs for women who have voluntarily entered the labor force.[7] For those wives who are employed, similar probit equations are specified for whether the woman works full-time, and whether she uses her skills in her job.

Selectivity Correction

For the analysis which compares military and civilian wives' earnings, it is important to control for potential selectivity bias because only those

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[6] For a complete description of the probit technique see Maddala (1983).

[7] The results of the model estimation are biased to the extent that some women are not in the labor force because they have dropped out after failing to find a job. We expect that the bias introduced by this factor is relatively small and does not seriously compromise the estimation results.

women who are working are observed to be earning income.[8] A two-step selectivity correction procedure (Heckman, 1979), with a probit equation as the first stage to predict whether the wife earns income, is used to examine the determinants of married women's earnings. The first step probit equation is estimated for the full sample of married women, and is similar in form to Equation (1), with the exception that the dependent variable is defined as whether the woman is employed.

It is important to note that all women are included in the first step of the estimation, regardless of whether they are in the labor force. For the estimation of earnings it is necessary to correct for potential selectivity bias because we only observe wages for those women who work, and a reason for not working (either unemployed or not in the labor force) may be that reservation wages are higher than wage offers. Unlike the model of whether a woman is employed, in this case it is crucial to control for differences in the characteristics of women who work and who do not work.

The fitted value of the probability of being employed from this equation is used to create an inverse Mills ratio, a measure of the bias introduced in the estimation of earnings because some the women were not employed and therefore had zero income. The inverse Mills ratio (λ_i) is computed for each individual i:

$$\lambda_i = f(Z_i)/F(Z_i) \tag{2}$$

where: $f(Z_i)$ is the standard normal density function, $F(Z_i)$ is the cumulative distribution function, and Z_i is the fitted value of the probability of being employed computed from the coefficient estimates obtained from the probit equation.

The second step of the procedure is an ordinary least squares (OLS) estimation of both hourly wages and annual income (for those women who earned income) and allows an analysis of whether being a military wife affects earnings, while controlling for other factors. Both hourly wages and annual income are examined because factors that are peculiar to the military household (e.g., frequent relocations) may have different effects on these earnings measures. The inverse Mills ratio is included as an independent explanatory variable in the OLS estimations of earnings and its estimated coefficient represents the normalized covariance between the error term in the probit equation and the error term of the income equations. In effect, the inverse Mills ratio corrects for the potential selectivity bias introduced by the exclusion of women with zero income in the OLS estimations of income. Also included in the income estimations is a dummy variable indicating whether the woman has a military husband in order to test for differences in earnings between military and civilian wives which are not accounted for by other factors.

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[8]For the purposes of this report, "earnings" refers to either wages or earned income, and includes self-employed and/or labor income.

Instrumental Variables

For the analysis of satisfaction with military life it is important to control for both the indirect and direct effects of individual, family and Army factors on satisfaction. For example, the geographic location of the household may have a direct influence on the spouse's satisfaction with military life, and may also have an indirect effect on satisfaction which operates through spouse employment. An instrumental variable approach is taken to account for these two effects. The likelihood that the spouse is employed, unemployed, and not in the labor force (the omitted category) are separately estimated using a probit equation similar to Equation (1), above. Fitted values (probabilities) using the results of these probit estimations are then entered in an OLS estimation of satisfaction with military life, where satisfaction is measured as a continuous index.[9]

Simulations

The interpretation of the magnitude of the coefficients in a probit model is difficult because the fitted value from the estimation is not a predicted probability. The probit estimates must be transformed into predicted probabilities before the magnitude of the effects of the estimation parameters can be meaningfully assessed. Probabilities are estimated for hypothetical households having sample means for all independent variables, and then changes in these probabilities are determined which result from changes in specific policy variables. The simulation results are revealing because statistical significance of a relationship does not necessarily indicate that the effect of the independent variable on the dependent variable will be large. The simulations based on the probit results present the effects of changes in independent variables on the probability of each work outcome.

Simulations are also carried out using the results of the OLS earnings equations. A direct interpretation of the coefficients of the earnings equations is difficult because semi-log estimations of hourly wages and annual income are performed. Moreover, because the earnings equations are corrected for selectivity bias, a simulation of a change in an independent variable initially requires that a change in the inverse Mills ratio be determined. Changes that affect the inverse Mills ratio represent a change in the likelihood that a spouse is employed which, in turn, may affect earnings. These indirect effects of independent variables are thereby controlled for in the simulations of direct effects of independent variables on earnings.

A similar approach is taken to simulate the direct and indirect effects of independent variables on spouse satisfaction with military life. Changes in factors that influence the probability of being employed and unemployed which subsequently affect satisfaction (the indirect effects) are taken into

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[9]Satisfaction with the military way of life is based on the spouse's response to Question 85 of the 1985 DoD Survey of Military Spouses. Responses range from very dissatisfied to very satisfied, an index of seven possible levels of satisfaction.

account, as well as the direct effect of these factors on satisfaction with the military way of life.

Data Sources

U.S. Current Population Survey

In order to examine whether military wives have significantly different work outcomes than comparable civilian wives, a data set containing observations on both types of spouses is required. DoD data sets only contain observations on military wives, so U.S. census data, collected in the same year (1985) as the DoD data used for the analysis that focuses on Army wives, were chosen for the analysis.

The Current Population Survey (CPS), sponsored by the Bureau of Labor Statistics and conducted by the Bureau of the Census, is well suited for the comparison and analysis of work outcomes for military and civilian wives. The universe is the civilian noninstitutional population of the U.S. and members of the military stationed in the U.S.[10] The March CPS file, also known as the Annual Demographic File, provides labor force data, data on income, employment status, and occupation, as well as individual and household characteristics.

A subset of the March 1985 CPS is used for the analysis of labor force participation, employment, and earnings of married women. Because the focus of this research is on the behavioral similarities and differences of women married to civilian men versus women married to military men, the sample is restricted to women who are between the ages of 16 and 45, with husbands who are full-time workers.[11] These selection criteria result in a sample population of 17,560 married women, of whom 17,010 have civilian husbands and 550 have husbands in the military.

The 1985 DoD Surveys

In order to focus specifically on Army wives, the latest available DoD data containing information on Army spouse work behavior was used for the analysis.

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[10]Because the CPS sample only contains members of the Armed Forces stationed in the U.S., the analysis necessarily excludes military wives who are located outside of the U.S. In a separate analysis these military wives are shown to have significantly different work outcomes due to limited employment opportunities overseas (Schwartz, Wood, & Griffith, in preparation).

[11]In order to provide additional measures of comparability, the age restriction is imposed to capture the sample of military wives and similarly aged civilian wives and, because military personnel can safely be assumed to be full-time workers, civilian wives with husbands who do not work full-time are excluded from the analysis. It is expected that the work outcomes for women who fall outside of these parameters would be significantly different than for the population examined.

The 1985 DoD Surveys of Officer and Enlisted Personnel and Military Spouses produced two primary data files: a Member File which includes officers and enlisted personnel and a Spouse File which includes spouses only. A subset of the 1985 DoD Spouse Survey is the primary source of data for the analysis of labor force outcomes of Army wives. These data are also used for the analysis of the determinants of satisfaction with military life. The dataset was constructed by selecting all female, non-military, Army spouses from the Spouse file. Several income variables from the Member file were merged with the Spouse file to create the final data set, referred to as the Army Couple file. The Army Couple file has 9,083 observations which includes spouses of officer and enlisted personnel and was used for the analyses of Army spouses in this report.[12]

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[12]See Griffith, Doering, and Mahoney (1986) for a complete description of the survey design and detailed information about the sample, data collection, response rates, and questionnaires.

Comparison between Military and Civilian Spouses

Recent census data indicate that military wives have a higher unemployment rate and earn less than civilian wives.[13] Some researchers have suggested that employers may be reluctant to hire military wives and, if wives are hired, pay them lower than market wages.[14] Wage and employment discrimination against military wives is an important issue for the military because of the relationship of the employment of military wives to the performance and retention of military personnel. There is a concern that if being in the military limits a wife's ability to obtain satisfactory employment, then her husband may be less likely to perform well in his job and less likely to remain in the Army. Due to the costs incurred from lower productivity and the replacement and retraining of personnel, there may be significant savings to the military from improved employment opportunities for the wives of military personnel.

While there is a large literature on female labor force participation and earnings, there have been no systematic investigations which focus on the military wife. The purpose of the research presented in this section is to examine labor force participation, employment, and earnings of military and civilian wives to determine if there are significant differences in work outcomes for these women, and to examine the underlying factors that may be responsible for these differences. The results of the research have important policy implications for the military, both in terms of addressing the employment problems of military wives and ultimately for improving job performance and retention of military personnel.

The variables and summary statistics for the Current Population Survey sample used in the research are described in the following section. The regression results are presented in the third section, followed by the simulation results in the fourth section.

Variable Definitions and Descriptive Statistics

The variables used in the analyses are listed and defined in Table 2. Means of civilian, military, and the full sample of married women are given in Table 3. Sample means and standard deviations, and means by sub-sample for each model are given in Appendix Tables A-1 through A-3.

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[13]The census data referred to were found in the March 1985 Current Population Survey, the data used for the analysis contained in this section. A description of the data is given in the previous section. Data which support the statement are given in Table 3.

[14]For a review of the theory and empirical evidence which suggests that discrimination may be a problem for military wives, see Army Spouse Employment Literature Review (Research Triangle Institute, in preparation).

Table 2

Comparison Between Military and Civilian Spouses: Variable Names and
Definitions

Dependent Variables:

Labor Force
    Participation

Dichotomous variable set equal to 1 if
woman is in the labor force and zero
otherwise, <u>for all women</u>.

Employed

Dichotomous variable set equal to 1 if
woman is employed and zero if woman is
unemployed, <u>for women in the labor force</u>.

Earns Income

Dichotomous variable set equal to 1 if
woman works for pay and zero otherwise,
<u>for all women</u>.

Log Hourly Wage

Log of woman's hourly wage.

Log Annual Income

Log of woman's annual earnings.

Independent Variables:

Husband in Military

Whether husband is in the military,
dummy variable (1=yes, 0=no).

Age

Wife's age, in years.

Age Squared

Wife's age, squared.

Education

Wife's education, years of formal schooling
completed.

Black

Wife's race is black, dummy variable
(1=yes, 0=no).

Hispanic

Wife's ethnicity is Hispanic, dummy
variable (1=yes, 0=no).

Husband's Earnings

Husband's annual income, in thousands.

Husband in Professional
    Occupation

Husband occupation-professional, dummy
variable (1=yes, 0=no).

Husband in Tech/Sales
    Occupation

Husband occupation-tech,sales,clerical,
dummy variable (1=yes, 0=no).

Husband in Service
    Occupation

Husband occupation-services, dummy
variable (1=yes, 0=no).

Table 2 (Continued)

Comparison Between Military and Civilian Spouses: Variable Names and
Definitions
_____

Husband in Laborer   Husband occupation-laborer, dummy
   Occupation   variable (1=yes, 0=no).

Husband in Other   Husband occupation-agriculture and
   Occupation   other, excluded category.

Managerial Occupation   Wife's occupation-administrator/manager,
                              dummy variable (1=yes, 0=no).

Professional Occupation   Wife's occupation-professional, dummy
                              variable (1=yes, 0=no).

Health-Related Occupation   Wife's occupation-health assistant,
                              dummy variable (1=yes, 0=no).

Teaching Occupation   Wife's occupation-teacher, except post-
                              secondary, dummy variable (1=yes, 0=no).

Technician Occupation   Wife's occupation-technician, dummy
                              variable (1=yes, 0=no).

Sales Occupation   Wife's occupation-sales, dummy variable
                              (1=yes, 0=no).

Clerical Occupation   Wife's occupation-clerical, dummy
                              variable (1=yes, 0=no).

Service Occupation   Wife's occupation-services, dummy
                              variable (1=yes, 0=no).

Manufacturing Occupation   Wife's occupation-manufacturing, dummy
                              variable (1=yes, 0=no).

Other Occupation   Wife's occupation-other (also includes
                              27 women with no work experience),
                              omitted category.

Full Time   Wife is full-time worker, dummy
                              variable (1=yes, 0=no).

Self-Employed   Wife is self-employed, dummy variable
                              (1=yes, 0=no).

Part Time and Self-   Wife is part-time and self-employed,
   Employed   dummy variable (1=yes, 0=no).

Table 2 (Continued)

Comparison Between Military and Civilian Spouses: Variable Names and Definitions

No Children, Young	No children and wife is age 29 or younger, excluded category.
Youngest Child Age 0-2	Youngest child is age 0-2, dummy variable (1=yes, 0=no).
Youngest Child Age 3-5	Youngest child is age 3-5, dummy variable (1=yes, 0=no).
Youngest Child Age 6-11	Youngest child is age 6-11, dummy variable (1=yes, 0=no).
Youngest Child Age 12-17	Youngest child is age 12-17, dummy variable (1=yes, 0=no).
Youngest Child Age 18+	Youngest child is age 18+, or no children and wife is age 30 or older, dummy variable, (1=yes, 0=no).
Number of Families in Household	Number of families in the household. A family is a group of two persons or more residing together and related by birth, marriage, or adoption. A household consists of all the persons who occupy a house, an apartment, or other group of rooms, or a room, which constitutes a housing unit.
Moved in Past 5 Years	Whether the wife made a major move in location in the last five years, dummy variable (1=yes, 0=no).
Central City	Whether the household is located in a central city area, dummy variable (1=yes, 0=no).
Metropolitan Area	Whether the household is located in one of the largest fifty-seven U.S. metropolitan areas, dummy variable (1=yes, 0=no).
New England Region	New England region, dummy variable (1=yes, 0=no).
Mid-Atlantic Region	Mid-Atlantic region, dummy variable (1=yes, 0=no).

Table 2 (Continued)

Comparison Between Military and Civilian Spouses: Variable Names and
Definitions

East North Central Region	East North Central region, dummy variable (1=yes, 0=no).
West North Central Region	West North Central region, dummy variable (1=yes, 0=no).
South Atlantic Region	South Atlantic region, dummy variable (1=yes, 0=no).
East South Central Region	East South Central region, dummy variable (1=yes, 0=no).
West South Central Region	West South Central region, dummy variable (1=yes, 0=no).
Mountain Region	Mountain region, dummy variable (1=yes, 0=no).
Pacific Region	Pacific region, omitted category.
Mills Ratio	Selectivity correction variable.

Table 3

Comparison Between Military and Civilian Spouses: Sample Means by Military
and Civilian Wives

Variable	Military	Civilian	All
LFP Model:	(N=550)	(N=17010)	(N=17560)
Labor Force Participation	0.5200	0.6700	0.6653
Husband in Military	----	----	0.0313
Age	29.4782	32.9497	32.8409
Age Squared	911.0818	1131.4655	1124.5628
Education (Yrs)	13.0018	12.8565	12.8610
Black	0.0964	0.0528	0.0542
Hispanic	0.0745	0.0974	0.0966
Husband's Earnings	19.8805	25.8122	25.6264
Number of Families in HH	1.0327	1.0396	1.0394
Husband in Prof Occupation	0.0000	0.2859	0.2770
Husband in Tech/Sales Occ	0.0000	0.1914	0.1854
Husband in Service Occ	0.0000	0.0657	0.0637
Husband in Labor Occ	0.0000	0.4240	0.4108
Youngest Child Age 0-2	0.3400	0.2531	0.2559
Youngest Child Age 3-5	0.1545	0.1542	0.1542
Youngest Child Age 6-11	0.1745	0.2061	0.2051
Youngest Child Age 12-17	0.0855	0.1490	0.1470
Youngest Child Age 18+	0.0673	0.1276	0.1257
Moved in Past 5 Years	0.7945	0.2171	0.2352
New England Region	0.0345	0.0806	0.0792
Mid-Atlantic Region	0.0182	0.1321	0.1285
East North Central Region	0.0582	0.1423	0.1396
West North Central Region	0.0873	0.1017	0.1013
South Atlantic Region	0.2527	0.1495	0.1527
East South Central Region	0.0400	0.0503	0.0500
West South Central Region	0.0764	0.0996	0.0989
Mountain Region	0.0964	0.1032	0.1030
Metropolitan Area	0.2036	0.3526	0.3480
Central City	0.1564	0.1868	0.1858

Table 3 (Continued)

Comparison Between Military and Civilian Spouses: Sample Means by Military and Civilian Wives

Variable	Military	Civilian	All
Employment Model:	(N=286)	(N=11397)	(N=11683)
Employed and in the Labor Force	0.8497	0.9481	0.9457
Managerial Occupation	0.0769	0.0854	0.0852
Professional Occupation	0.0315	0.0660	0.0651
Health-Related Occupation	0.0559	0.0428	0.0431
Teaching Occupation	0.0385	0.0752	0.0743
Technician Occupation	0.0420	0.0379	0.0380
Sales Occupation	0.1678	0.1133	0.1146
Clerical Occupation	0.2937	0.3080	0.3076
Service Occupation	0.1958	0.1395	0.1409
Manufacturing Occupation	0.0420	0.0906	0.0894
Earnings Models:	(N=207)	(N=9810)	(N=10017)
Wife's Hourly Wage	5.7125	6.0733	6.0657
Wife's Annual Income	6470.10	8355.93	8311.88
Full Time	0.4638	0.5545	0.5527
Self-Employed	0.0242	0.0276	0.0276
Part Time and Self-Employed	0.0193	0.0163	0.0164

The sample statistics given in Table 3 indicate that a lower proportion of military wives are in the labor force (52 percent) than civilian wives (67 percent). The average military wife is about 29 years old, considerably younger than the average civilian wife (about 33 years old). The proportion of military wives whose youngest child is under two years old is larger than civilian wives (34% versus 25%) and indicates that the children of military wives are generally younger than those of civilian wives. Military wives have about the same level of education (about 13 years) as civilian wives, and there is a larger proportion of black military wives (about 10 percent) than black civilian wives (about 5 percent). The average annual income of husbands is considerably less for the military ($1,880) relative to the civilian sample ($25,810). Over 79 percent of military wives made a major move in location over the previous five year period compared to about 22 percent of civilian wives. The proportion of military wives living in large metropolitan areas (20%) and in central cities (16%) is less than the proportion of civilian wives in these areas (35% and 19%). In addition, military wives are more heavily concentrated in the South Atlantic region, and less heavily concentrated in the New England, Mid Atlantic, and East North Central regions.

Of married women in the labor force about 85 percent of military wives are employed (15 percent unemployed) compared to an employment rate of about 95 percent for civilian wives (5 percent unemployed). The occupation of the women in the labor force also differs between military and civilians. There is a higher proportion of military wives in health, sales, and service occupations, and a lower proportion in professional, teaching, clerical, and manufacturing occupations.

For women who are employed, the average military wife earns $5.71 per hour and $6470 per year, compared to the average civilian wife who earns $6.07 per hour and $8356 per year. Of these women, 46 percent of the military wives work full-time compared to 55 percent of civilian wives.

Results

The results of the probit estimations for labor force participation and employment including coefficient estimates, asymptotic t-statistics, and log likelihood ratios, are presented in Table 4.

In general, the coefficients are interpreted in terms of the direction of change in the probability that the wife will be in each of the work-related outcomes (i.e., in the labor force, or employed), given a change in each independent variable.

Labor Force Participation

The coefficient estimate for having a husband in the military is found to be a statistically significant and negative factor of labor force participation. The result suggests that women who are married to men in the military are less likely to be in the labor force, all else equal. One possible explanation for this result is that military wives may be more likely

Table 4

Comparison Between Military and Civilian Spouses: Probit Estimation Results
For Labor Force Participation (LFP) and Employment (Employed) (t-statistics)

Independent Variable	LFP	Employed
Intercept	-1.0584 *** (-4.1799)	0.8875 * (-1.9537)
Husband in Military	-0.2133 *** (-2.6387)	-0.4635 *** (- 4.5748)
Age	0.0798 *** (5.1559)	0.0932 *** (3.17(3)
Age Squared	-0.0014 *** (-6.0646)	-0.0011 ** (-2.5164)
Education	0.1061 *** (21.3824)	0.0496 *** (4.7341)
Black	0.3043 *** (6.1335)	-0.2559 *** (-3.3611)
Hispanic	-0.0097 (-0.2561)	-0.0826 (-1.1332)
Husband's Earnings	-0.0129 *** (-18.0648)	----
Number of Families in Household	-0.1490 *** (-3.2436)	----
Husband in Professional Occupation	0.2693 *** (4.3327)	----
Husband Tech/Sales Occupation	0.3079 *** (4.9428)	----
Husband in Service Occupation	0.2687 *** (3.8349)	----
Husband in Labor Occupation	0.1804 *** (3.0725)	----
Managerial Occupation	----	0.5161 *** (4.8182)
Professional Occupation	----	(.5868 *** (4.6096)

Table 4 (Continued)

Comparison Between Military and Civilian Spouses: Probit Estimation Results
For Labor Force Participation (LFP) and Employment (Employed) (t-statistics)

Independent Variable	LFP	Employed
Health-Related Occupation	----	0.8096 *** (.0867)
Teaching Occupation	----	0.7810 *** (5.5534)
Technician Occupation	----	0.4305 *** (3.3572)
Sales Occupation	----	0.3986 (4.3079)***
Clerical Occupation	----	0.5747 (6.8311)***
Service Occupation	----	0.4378 *** (4.9516)
Manufacturing Occupation	----	0.0723 (0.8086)
Youngest Child Age 0-2	-1.0308 *** (-23.9951)	-0.3053 *** (-4.2048)
Youngest Child Age 3-5	-0.7770 *** (-15.8815)	-0.3188 *** (-3.7565)
Youngest Child Age 6-11	-.4299 *** (-8.3251)	-0.3310 *** (-3.7162)
Youngest Child Age 12-17	-0.1518 *** (-2.6301)	-0.3120 *** (-3.0569)
Youngest Child 18+	-0.0279 (-0.4759)	-0.2808 *** (-2.7843)
Moved in Past 5 Years	-0.1846 *** (-7.1841)	-0.2041 *** (-4.2557)
New England Region	0.0238 (0.5019)	0.0559 (0.5857)

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Table 4 (Continued)

Comparison Between Military and Civilian Spouses: Probit Estimation Results
For Labor Force Participation (LFP) and Employment (Employed) (t-statistics)

Independent Variable	LFP	Employed
Mid-Atlantic Region	-0.2104 ***	-0.1078
	(-5.3423)	(-1.3448)
East North Cen Region	-0.0778 **	-0.1605 **
	(-1.9918)	(-2.1087)
West North Cen Region	0.1229 ***	0.0964
	(2.7878)	(1.0946)
South Atlantic Region	0.0020	0.0566
	(0.0503)	(0.7345)
East South Cen Region	-0.2071 ***	-0.1605
	(-3.8152)	(-1.5849)
West South Cen Region	-0.0403	-0.0609
	(-0.9402)	(-0.7311)
Mountain Region	-0.0840 *	0.0027
	(-1.9480)	(0.0318)
Metropolitan Area	-0.0377	0.0272
	(-1.5353)	(0.5628)
Central City	-0.0427	0.0963 *
	(-1.5240)	(1.7167)

*** t-statistic significant at .01 level
 ** t-statistic significant at .05 level
  * t-statistic significant at .10 level

(-2.0) Times Log Likelihood Ratio (distributed Chi-square):

	2325.92 (28 d.f.)	393.93 (31 d.f.)
PROB > χ^2	.0001	.0001

Observations:

Dep Variable = 0	5877	634
Dep Variable = 1	11683	11049
Total	17560	11683

to be discouraged workers.[15]   That is, they may be less likely to find a job and, after some period of searching, they may simply stop looking for work and drop out of the labor force.[16]

Another plausible explanation for the result is related to the frequency of changes in location. A change in location in the previous five years is found to be a statistically significant and negative predictor of participation, but may not fully capture the greater likelihood that a military wife has recently moved.[17] Because military wives change locations more frequently than civilian wives, they may be more likely to be temporarily out of the labor force setting up the household and getting adjusted to new surroundings before looking for a job at the new location.[18] Yet another possible explanation is that military wives may be more likely than civilian wives to prefer home production, and perhaps volunteer work, to jobs for pay in the market labor force.[19]

Other results from the estimation are basically in keeping with the findings of earlier investigations of labor force participation of married women. Differences in the characteristics of military and civilian wives are seen to be responsible for countervailing influences on the likelihood that a military wife will participate in the labor force relative to a civilian wife. The results suggest, as expected, that older women, with more potential years of labor market experience, are more likely to participate, up to a point, and

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[15]A discouraged worker is defined as someone who has dropped out of the labor force because of difficulty in finding a job, either because no suitable jobs are available or because the reservation wage exceeds perceived wage offers.

[16]Data on the length of time spent searching for a job are unfortunately not included in the data sets used for the analyses.

[17]The March 1985 CPS data, unlike previous CPS samples, does not contain data on whether the household moved in the previous year, a variable that may have been preferred to whether the household moved in the previous five year interval. However, the variable used in these analyses serves as a good proxy for whether the woman is likely to be a frequent or infrequent mover. The variable has been constructed to reflect moves that were likely to cause an interruption in work (e.g., a move from a different noncontiguous state).

[18]Based on DoD data, the average length of time spent in one location for a military wife in 1985 was less than 24 months (Griffith et al., 1986).

[19]Military wives, particularly the wives of officers, are often expected to do a certain amount of volunteer work. Unfortunately, the CPS data do not distinguish between officer and enlisted husbands, nor do they give information on unpaid volunteer work.

beyond the point, less likely.[20] In general, women with younger children, and therefore higher reservation wages, appear to be less likely to be in the labor force. Because military wives have relatively younger children than civilian wives, this factor also contributes to a lower likelihood that they participate.

Other characteristics of military wives tend to increase the likelihood that they participate in the labor force relative to civilian wives. The results suggest that wives who have husbands with low incomes are more likely to be in the labor force. The result is consistent with previous findings and suggests that households with a greater financial need are more likely to have the wife in the labor force. This factor tends to increase the relative probability of military wives being in the labor force because their husbands' salaries are lower than those of civilian husbands. The results also suggest that black married women are more likely to be in the labor force and, because there is a larger proportion of black military wives than black civilian wives, this factor also contributes to a relatively higher likelihood of a military wife being in the labor force.

Employed versus Unemployed

There are a few differences between the specification for whether the wife is in the labor force and the model of whether the wife is employed. The specification for employment omits the husband's income and occupation, and includes the wife's occupation to control for differences in labor demand for various occupations.[21]

Having a husband in the military is found to be a statistically significant and negative factor of whether the wife is employed. That is, after controlling for socioeconomic and demographic differences between military and civilian wives, military wives still have a lower probability of being employed than comparable civilian wives. This residual effect of being a military wife may be due, in part, to hiring discrimination. Employers may prefer civilian wives who are less likely to move out of the area. Another possible explanation is that because military wives move more frequently (and moving is found to be a statistically significant and negative factor of

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[20]The age of the woman where the likelihood of labor force participation is at its maximum, is about 30 years old.

[21]While husband's income was found to affect labor force participation, there is no reason to expect that, once the woman enters the labor force, the husband's earnings will affect the likelihood that she is employed. Although the husband's occupation was included in the labor force participation model to control for tastes and preferences, the husband's occupation is omitted in the model of whether the woman is employed or unemployed.

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employment), they are probably more likely to be temporarily unemployed as a result of relocating.[22]

Other results of the estimation serve to identify the characteristics of military wives which also lead to a relatively higher observed unemployment rate for these women. Because age is seen to positively influence employment, the result suggests that part of the reason that military wives are less likely to be employed is simply that they are relatively young. The presence of younger aged children tends to increase the reservation wage for these women, and this also negatively relates to being employed. The higher proportion of black wives in the military is an additional negative influence on the relative probability that military wives are employed.

On the other hand, the results suggest that some characteristics of military wives tend to be offsetting positive influences on the likelihood that a woman is employed. For example, women in health, sales, and service occupations are more likely to be employed, and these are occupations where there is a larger proportion of military than civilian wives.

Wage Rates and Annual Income

Two dependent variable measures of earnings are estimated with ordinary least squares (OLS) in semi-log form: (1) the log of the hourly wage rate, and (2) the log of annual income. The results of the first stage probit estimation and the two earnings estimations are given in Table 5.

The results of the first stage probit estimation of whether the woman earns income indicate that, regardless of whether or not a woman is in the labor force, being a military wife is a statistically significant and negative factor of being employed.[23] However, the results of the earnings estimations indicate that being a military wife is not a statistically significant determinant of hourly wages or annual income. The results suggest that there

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[22]Another possible explanation is that sufficient controls for labor market demand conditions have not been fully captured by the wife's occupation and geographic location variables.

[23]The result is consistent with the previous result found in the estimation of whether a woman in the labor force is employed.

Table 5

Comparison Between Military and Civilian Spouses: Probit Selectivity and OLS
Earnings Estimation Results (t-statistics)

Independent Variable	Earns Income	Log of Hourly Wage	Log of Annual Income
Intercept	0.1343 (0.525)	-0.4503 ** (-2.265)	6.0669 *** (24.329)
Husband in Military	-0.1806 ** (-2.227)	-0.0395 (0.719)	-0.1029 (-1.494)
Age	0.0204 (1.310)	0.0905 *** (7.343)	0.1018 *** (6.591)
Age Squared	-0.0007 *** (-2.932)	-0.0013 *** (-7.007)	-0.0014 *** (-6.232)
Education	.0982 *** (19.878)	0.0478 *** (10.020)	0.0460 *** (7.687)
Black	0.3248 *** (6.478)	0.0546 * (1.658)	0.1009 ** (2.445)
Hispanic	-0.0074 (-0.196)	-0.0244 (-0.811)	0.0259 (0.687)
Husband's Earnings	-0.0116 *** (-16.056)	----	----
Number of Families in HH	-0.1450 *** (-3.126)	----	----
Husband in Prof. Occupation	0.2528 *** (4.079)	----	----
Husband in Tech/ Sales Occupation	0.2697 *** (4.342)	----	----
Husband in Service Occupation	0.2978 *** (4.248)	----	----
Husband in Labor Occupation	0.2139 *** (3.652)	----	----
Full Time	----	0.1534 *** (9.470)	1.0623 *** (52.296)

Table 5 (Continued)

Comparison Between Military and Civilian Spouses: Probit Selectivity and OLS
Earnings Estimation Results (t-statistics)

Independent Variable	Earns Income	Log of Hourly Wage	Log of Annual Income
Self-Employed	----	-0.4631 *** (-6.435)	-0.3921*** (-4.345)
Part Time and Self-Employed	----	-0.1897 ** (-2.031)	-0.2482 ** (-2.118)
Managerial Occupation	----	0.3521 *** (7.090)	0.4556 *** (7.314)
Professional Occupation	----	0.3974 *** (7.479)	0.4312 *** (6.471)
Health Occupation	----	0.5788 *** (10.403)	0.6972 *** (9.992)
Teaching Occupation	----	0.2921 *** (5.548)	0.3085 *** (4.674)
Technician Occupation	----	0.4260 *** (7.583)	0.5042 *** (7.158)
Sales Occupation	----	0.0343 (0.721)	0.0313 (0.524)
Clerical Occupation	----	0.1845 *** (4.215)	0.2268 *** (4.130)
Service Occupation	----	-0.0766 (-1.639)	-0.1732 *** (-2.957)
Manufacturing Occupation	----	0.1523 *** (3.116)	0.3061 *** (4.993)
Youngest Child Age 0-2	-0.9658 *** (-21.158)	-0.0433 (-1.398)	-0.1601 *** (-4.124)
Youngest Child Age 3-5	-0.8271 *** (-16.119)	-0.0902 *** (-2.662)	-0.2203 *** (-5.185)

Table 5 (Continued)

Comparison Between Military and Civilian Spouses: Probit Selectivity and OLS
Earnings Estimation Results (t-statistics)

Independent Variable	Earns Income	Log of Hourly Wage	Log of Annual Income
Youngest Child Age 6-11	-0.4905 *** (-9.118)	-0.1332 *** (-3.899)	-0.2523 *** (-5.889)
Youngest Child Age 12-17	-0.2188 *** (-3.683)	-0.1014 *** (-2.637)	-0.1609 *** -3.337)
Youngest Child 18 or Over	-0.1028 * (-1.711)	0.0089 (0.240)	-0.0458 (-0.991)
Moved in Past 5 Years	-0.0796 *** (-3.067)	-0.0288 (-1.488)	-0.0529 ** (-2.177)
New England Region	0.0835 * (1.764)	-0.0817 ** (-2.428)	-0.1038 ** (-2.458)
Mid-Atlantic Region	-0.1160 *** (-2.953)	-0.1572 *** (-5.267)	-0.1887 *** (-5.042)
East North Central	-0.0194 (-0.498)	-0.1306 *** (-.513)	-0.1486 *** (-4.095)
West North Central	0.1247 *** (2.842)	-0.2201 *** (-7.029)	-0.1867 *** (-4.755)
South Atlantic Region	0.0539 (1.387)	-0.1517 *** (-5.355)	-0.1293 *** (-3.641)
East South Central	-0.1492 *** (-2.742)	-0.2275 *** (-5.417)	-0.2109 *** (-4.005)
West South Central	-0.0026 (-0.603)	-0.1732 *** (-5.318)	-0.1444 *** (-3.534)
Mountain Region	-0.0250 (-0.580)	-0.1141 *** (-3.515)	-0.0915 ** (-2.247)

Table 5 (Continued)

Comparison Between Military and Civilian Spouses: Probit Selectivity and OLS
Earnings Estimation Results (t-Statistics)

Independent Variable	Earns Income	Log of Hourly Wage	Log of Annual Income
Metropolitan Area	-0.0329 (-1.340)	0.1291 *** (7.271)	0.1242 *** (5.579)
Central City	-0.0550 ** (-1.964)	0.0502 ** (2.467)	0.0759 *** (2.977)
Mills Ratio	----	-0.0644 *** (-2.662)	0.0126 (0.415)

*** t-statistic significant at .01 level
** t-statistic significant at .05 level
* t-statistic significant at .10 level

(-2.0) Times Log Likelihood Ratio (distributed Chi-square):
                1910.42 (28 d.f.)

PROB > χ^2 .0001

F   58.863 (35 d.f.) 153.783 (35 d.f.)

PROB > F   .0001   .0001

Adjusted R-square   0.1534   0.3481

Observations:
Dep Variable = 0   5564
Dep Variable = 1   11996

        Total   17560   10017   10017

is no systematic wage discrimination against military wives.[24] It appears that, while military wives are less likely to be employed, status as a military wife does not affect earnings once other background characteristics are taken into account.[25] Individual and household characteristics which directly affect earnings, and which differentiate military wives from civilian wives, are seen to be responsible for observed differences in hourly wages and annual income.

Interruptions in work appear to have a negative effect on annual income, but not on hourly earnings. A change in location is found to be a statistically significant and negative factor of annual income and, because military wives move more often than civilian wives, the results suggest that these interruptions are partially responsible for annual income differentials between the two groups. It is likely that a change in location causes some period of adjustment and unemployment which decreases annual income relative to that earned by civilian wives. Hourly wage rates, on the other hand, do not appear to be significantly affected by changes in location. Other individual and household factors appear to be more important determinants of wage rates.

A location in a large metropolitan area and in a central city are found to be statistically significant and positive predictors of both hourly wages and annual income, suggesting that, because military wives are not located in these areas in the same proportion as civilian wives, military wives earn less than civilians, on average.

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[24]The result should be viewed with some caution. A more complete econometric specification to test for discrimination would include the estimation of the earnings equations separately for military and civilian wives (followed by an estimation of a wage gap by multiplying the difference between military and civilian wives' characteristics times the estimated military wives' coefficients), and using two-stage least squares to control for potential simultaneity caused by women who have better labor market opportunities that may influence the participation decision (i.e., control for the possible reverse causation between wage rates and experience). However, because our estimations without these controls do not provide any evidence of discrimination against military wives in wage rates or annual earned income, it is unlikely that further controls will reveal statistically significant discrimination results.

[25]The selectivity variable (MILLS) is a statistically significant factor in the estimation of hourly wages, and corrects for the bias introduced from not observing wages for women who do not work. The correction variable is statistically insignificant in the estimation of annual income, and suggests that there is no selectivity bias present. The statistically significant and negative Mill's coefficient in the hourly wage estimation indicates the presence of a negative covariance between the error terms of hourly wage rates and the probit model which, if the Mill's ratio was not included in the estimation, would lead to an under prediction of hourly wage rates.

As expected, a woman's age is found to be a statistically significant and positive determinant of hourly wages and annual income. The results suggest that another reason military wives earn less than civilian wives is that they are younger and have fewer years available for work experience than civilian wives. In addition, the variables which control for the presence of children (under 18 years old) in the household are found to be negative determinants of wages and annual income and, in all but one case, are statistically significant. These results suggest that married women with children may be willing to accept lower paying jobs in order to accommodate day care and school schedules and, because a higher proportion of military wives have younger children than civilian wives, they earn less than civilian wives.

A larger proportion of military wives work part-time and, because working full-time is found to be a statistically significant and positive determinant

of wages and annual income, this factor also leads to earnings for military wives which are lower than for comparable civilian wives.[26]

Simulations

Table 6 presents simulations performed using the probit estimates to obtain predicted probabilities of labor force participation and employment, and selectivity corrected OLS estimates to obtain fitted values for hourly wage rates and annual income. Probabilities and earnings are estimated for hypothetical households having sample means for all independent variables, and then changes in these probabilities and earnings are determined which result from changes in independent variables.

The independent variables chosen for the simulations are those which were found to be particularly relevant for military wives. The changes examined are whether the woman is married to a husband in the military, a decrease in the average age of the woman, whether a child under two years old is present in the household, whether the woman moved in the last five years, and whether the woman is located in a large metropolitan area.

If each married woman in the sample had a value for each independent variable set at its sample mean for each model, then the information presented in Table 6 indicates that approximately 71 percent of the women would be in the labor force, about 96 percent of those in the labor force would be employed, the women would earn $6.37 an hour, and $8853 per year. The simulation results indicate expected changes in these average (base) probabilities and earnings that would result from changes in the explanatory

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[26]In a separate analysis a probit estimation was performed to examine whether being a military wife affects the likelihood of working full-time or part-time. The coefficient estimate for having a husband in the military was found to be a statistically insignificant determinant in the model. Other individual and household characteristics appear to account for a higher probability that a military wife works part-time (Schwartz, in preparation).

Table 6

Comparison Between Military and Civilian Spouses: Simulation Results

	LFP	Employed	Hourly Wage	Annual Income
Base Probability and Earnings	.7073	.9609	$6.37	$8853
Simulated Changes:				
Husband in the Military	-.0769*	-.0571*	-$0.18	-$884
Average Age of Military Spouse (29.48 years)	+.0091*	-.0072*	-$0.26*	-$393*
Child under 2 years old	-.3785*	-.0305*	+0.28	-$1481*
Moved in the last five years	-.0650*	-.0191*	-$0.16	-$468*
Live in large metropolitan area	-.0130	+.0023	+$0.85*	+$1117*

*Coefficient estimate is statistically significant at the .10 level, or better.

variables. The magnitude of changes are best evaluated relative to the base probabilities and earnings.

The simulation results indicate that women who are married to husbands in the military are .0769 less likely to be in the labor force and .0571 less likely to be employed. Relative to the base probability for women married to civilian husbands, being a military wife decreases the probability of being in the labor force by about 11 percent, and decreases the probability of being employed by about 6 percent. Having a husband in the military is not found to be a statistically significant factor of hourly earnings or annual income.

The average age of military wives is used to simulate the effect of younger age on the probability of being in the labor force, employed, and on earnings. The average age of military wives is 29.48 compared to the sample average of 32.84. The results indicate that the average aged military wife is slightly more likely (+.0091) to be in the labor force. The results indicate that the average age of military wives is near the peak of the concave labor force participation profile and that women who are older than this age are less likely to participate in the labor force.

The results also indicate that the average aged military wife is .0072 less likely to be employed. Relative to the base probability, younger average age decreases the probability of being employed by about .75 percent. In addition, the effect of younger average age decreases hourly earnings by about $.26, and decreases annual earnings by about $393. These results represent about a 4.1 percent decrease in average hourly wages and a 4.4 percent decrease in annual income due to younger average age.

The effect of having young children in the household is simulated by examining the change in probability of labor force participation, employment, and in earnings which results from having a child under two years old. The results indicate that women with children under two years old are .3785 less likely to be in the labor force than women without children in this age bracket. Relative to women without a child less than two years old, this represents a decrease of about 50 percent in the likelihood of being in the labor force. Women with children in this age group are also .0305 less likely to be employed, representing about a 3 percent decrease relative to women without children in the age group. Moreover, children under two years old decrease annual income by $1481 a year. This is about 17 percent less income than that made by women without children under two years old. The presence of children under two years old is not a statistically significant predictor of hourly wage rates.

The simulation results indicate that a woman who moved in the past five years is .0650 less likely to be in the labor force, and this represents about a 10 percent decrease in the likelihood relative to a woman who did not move. A woman who moved is seen to be .0191 less likely to be employed and relative to the base probability for a woman who did not move, this only represents about a 2 percent decline in the likelihood of being employed. The simulation results also indicate that a woman who moved would earn $468 per year less, or about 5 percent less than the average earnings of a woman who did not move. A

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move in the last five years is not found to be a statistically significant factor of hourly wage rates.

A woman who lives in a large metropolitan area is seen to earn $.85 per hour more, and $1117 per year more, than a woman who does not live in a large metropolitan area. Relative to the average earnings of women who do not live in these areas, these women earn about 12 percent more per hour, and about 16 percent more per year. Living in a large metropolitan area is not found to be a statistically significant predictor of labor force participation or employment.

Labor Force Status of Army Spouses

The purpose of the research presented in this section is to examine the underlying determinants of Army wives' labor force participation, employment, level of employment, and underemployment, with a focus on the effect of on-post spouse employment programs and other Army policies on these outcomes. The research is based on the 1985 DoD Member and Spouse Survey data, and uses both descriptive and multivariate regression methods to examine the factors related to spouse work outcomes.

Variable definitions and summary statistics are given in the next section. Regression results are presented in the second section, and are followed by simulation results.

Variable Definitions and Descriptive Statistics

The variables used in the analyses are taken from the Army Couple file described above. Table 7 provides a complete listing of all variables and definitions.

Means, standard deviations, and ranges of all analysis variables for the Army Couple sample are included in Table 8. Summary statistics of variables by sub-sample for each model are given in Appendix Tables A-4 through A-7.

The summary statistics indicate that the typical Army spouse in the sample has about one year of college education, is about 31 years old,[27] has lived in the same location a little over 23 months, has a husband who earns an average of $20,234 per year, and has had available about 12 years for labor force participation (potential experience). About 16 percent of the sample spouses are black, 7 percent are Hispanic, 9 percent other, and the remainder white.

About 46 percent of the sample have children under 6 years old, 68 percent have children under 12 years old, and 79 percent have children under 18 years of age. About 69 percent of the sample spouses live in the continental U.S. (CONUS), and 53 percent have available a spouse employment program on-post. Of the sample spouses who work, nearly 10 percent report that the reason they work is to meet basic family expenses, while nearly 66 percent report that they are working because they plan to have a career, or because they enjoy working.

In Table 9 we present selected characteristics of Army spouses by each of the four work-related outcomes. Sample weights are used to calculate these estimates of the percent of the total population of Army spouses in each category shown. These cross-tabulations also serve to illustrate the simple

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[27]Note that average age is not shown in Table 8, however potential experience is calculated from age and education (i.e., potential experience = age – years of education – 6).

Table 7

Labor Force Outcomes for Army Spouses: Variable Names and Definitions

Variable	Definition
Dependent Variables:	
Labor Force Participation	Dichotomous variable set equal to 1 if woman is in the labor force and zero otherwise, for all women.
Employed	Dichotomous variable set equal to 1 if woman is employed and zero if woman is unemployed, for women in the labor force.
Full Time	Dichotomous variable set equal to 1 if woman works full time and set equal to zero if woman works part time, for women who are employed.
Uses Skills	Dichotomous variable set equal to 1 if woman uses her training, job skills or experience a great deal or completely at her current job. Equals zero if woman uses her training, job skills or experience somewhat, very little or not at all, for women who are employed.
Independent Variables:	
Education	Spouse education, years of formal schooling completed.
Black	Race is black, dummy variable (1=yes, 0=no).
Hispanic	Ethnicity is hispanic or spanish, dummy variable (1=yes, 0=no).
Other	Race is neither black, hispanic or white, dummy variable (1=yes, 0=no).
White	Race is white, dummy variable (1=yes, 0=no) (Omitted category).
No Children, Young	No child dependents at location and spouse is age 29 or younger (1=yes, 0=no) (Omitted category).
Youngest Child Age 0-5	Youngest child is age 0-5, dummy variable (1=yes, 0=no).
Youngest Child Age 6-11	Youngest child is age 6-11, dummy variable (1=yes, 0=no).

Table 7 (Continued)

Labor Force Outcomes for Army Spouses: Variable Names and Definition

Variable	Definition
Youngest Child Age 12-17	Youngest child is age 12 - 17, dummy variable (1=yes, 0=no).
Youngest Child 18+	Youngest child is age 18 or older or no children at location and spouse age 30 or older, dummy variable (1=yes, 0=no).
CONUS	Geographic location is continental U.S., dummy variable (1=yes, 0=no).
Experience	Age minus years of schooling, minus 6.
Distance	Spouse rating of distance to population centers, 1 is very poor (long distance) and 5 is excellent (very close).
Husband's Wages	Member's annual taxable military income, in thousands.
Months at Location	Number of months at present location.
Spouse Employment Program	Spouse employment services are available on post, dummy variable (1=yes, 0=no).
Officer	Husband is an officer, dummy variable (1=yes, 0=no).
Work Career	If "planned to have career," 'independence/self-esteem," "enjoy working," or "gain experience for future career" was a major factor in decision to work, dummy variable (1=yes, 0=no).
Work Needs	If "needs money for basic family expenses" was a major contribution in decision to work AND "planned to have career," "independence/self-esteem," "enjoy working," and "gain experience for future career" were either minor contributions or no contribution in the work decision, dummy variable (1=yes, 0=no).

Table 8

Labor Force Outcomes for Army Spouses: Summary Statistics

Variable	Mean	Standard Deviation	Minimum Value	Maximum Value
LFP	0.5429	0.4982	0.0000	1.0000
Employed	0.7847	0.4111	0.0000	1.0000
Full Time	0.6606	0.4736	0.0000	1.0000
Uses Skills	0.5721	0.4949	0.0000	1.0000
Education	13.1542	2.2390	1.0000	20.0000
Black	0.1580	0.3647	0.0000	1.0000
Hispanic	0.0722	0.2589	0.0000	1.0000
Other	0.0945	0.2926	0.0000	1.0000
Child 0-5	0.4622	0.4986	0.0000	1.0000
Child 6-11	0.2170	0.4122	0.0000	1.0000
Child 12-17	0.1131	0.3167	0.0000	1.0000
Child 18+	0.0873	0.2823	0.0000	1.0000
CONUS	0.6871	0.4637	0.0000	1.0000
Hus Wages	20.2344	9.9161	3.7460	83.9570
Experience	12.1538	6.8885	0.0000	46.0000
Distance	3.7447	1.0009	1.0000	5.0000
Months at Location	23.2564	18.9880	0.0000	120.0000
Sps Emp Prg	0.5290	0.4992	0.0000	1.0000
Officer	0.3369	0.4727	0.0000	1.0000
Exp Sqrd	194.8988	208.7663	0.0000	2,116.0000
Work Career	0.6564	0.4750	0.0000	1.0000
Work Needs	0.0958	0.2944	0.0000	1.0000

Table 9

Labor Force Outcomes For Army Spouses: Characteristics by Labor Force Outcome (percent)

Independent Variable	Labor Force	Employed	Full Time	Uses Skills
Education:				
Less than 12 years	35	65	67	48
HS Degree	50	76	64	50
Some College	60	79	68	56
College Degree	61	79	68	63
More than a College Degree	73	83	72	75
Location:				
CONUS	54	77	66	57
OCONUS	52	75	66	49
Life Course:				
Spouse Age Less than 29 and No Children	67	73	69	52
Youngest Child Age 0-5	41	70	61	51
Youngest Child Age 6-11	61	81	62	56
Youngest Child Age 12-17	68	88	71	65
Youngest Child Age 18+, or No Children and Spouse Age 30+	62	80	77	57
Spouse Employment Program:				
No	46	77	67	58
Yes	59	76	66	53
ALL	53	77	67	55

underlying relationship between the independent variables and each of the outcomes.[28]

Over half (53 percent) of all Army spouses are in the labor force. Among those who are in the labor force, 77 percent report that they are employed, 67 percent report they are employed full-time, and 55 percent report that they use their skills in their job.

As the education of the spouse increases, the percent of the sample for each outcome tends to increase. Only 35 percent of Army wives with less than 12 years of education are in the labor force, with 65 percent of these employed. In contrast, 73 percent of the most highly educated (those with more than a college degree) are in the labor force, with 83 percent employed.

There is not a large difference in the percent of spouses in the labor force, employed, or level of employment by CONUS/OCONUS location. However, 57 percent of the CONUS spouses are in jobs which use their skills while only 49 percent of OCONUS spouses report that they are using their skills in their job.

Army spouses with children under age 5 have the lowest labor force participation rate (41 percent) and lowest employment rate (70 percent). Of all spouses by life course stage, those with the youngest child between the ages of 12 and 17 have the highest participation rate (68 percent), and also the highest employment rate (88 percent).

Spouses who have access to an on-post employment program have a 59 percent labor force participation rate; those that do not have a program have a 46 percent rate. However, the rate of employment and the percent of full-time workers is not very different for those with and without spouse employment programs. In locations where employment programs are available, there is a slightly lower percent of spouses who report using their skills (53 percent), than for locations where there is not an employment program (58 percent).

Results

The results of the probit estimation of each work outcome model, including coefficient estimates, asymptotic t-statistics, and log likelihood ratios, are presented in Table 10. Independent variable means variable for each model are given in Appendix Tables A-4 through A-7.

In general, the coefficients are interpreted in terms of the direction of change in the probability that the spouse will be in each of the work-related

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[28]It should be noted that the two-way cross-tabulations shown in Table 9 simply give the bivariate relationship between the independent variable and each outcome. Unlike regression models, all other variables are not held constant.

Table 10

Labor Force Outcomes for Army Spouses: Probit Estimation Results
(t-statistics)

Independent Variable	LFP	Employed	Full Time	Uses Skills
Intercept	-1.7050 ***	-0.4454 *	-0.0263	-1.3544***
	(-10.5042)	(-1.8594)	(-0.1102)	(-5.2958)
Education	0.1264 ***	0.0172	0.0311 **	0.0670***
	(12.3186)	(1.2169)	(2.0791)	(4.4355)
Black	0.4613 ***	-0.1163	0.1373 *	-0.2414***
	(8.0897)	(-1.6183)	(1.7959)	(-2.9185)
Hispanic	-0.0910	-0.2608 **	-0.0629	0.2145
	(-1.2624)	(-2.4374)	(-0.5237)	(1.6141)
Other	-0.1128 *	-0.1918 *	0.0381	-0.3023***
	(-1.7280)	(-1.8816)	(0.3495)	(-2.6027)
Youngest Child 0-5	-0.6968 ***	-0.2444 ***	-0.2832 ***	0.0465
	(-10.7639)	(-4.1337)	(-4.4884)	(0.7063)
Youngest Child 6-11	-0.1245	----	----	----
	(-1.5449)			
Youngest Child 12-17	0.2052 **	----	----	----
	(2.1457)			
Youngest Child 18+	0.0907	----	----	----
	(0.9264)			
CONUS	0.1384 ***	0.0110	-0.0569	0.1055
	(3.5146)	(0.1841)	(-0.9348)	(1.6413)
Husband's Wages	-0.0208 ***	----	0.0056	----
	(-5.7789)		(-0.9831)	
Experience	0.0488 ***	0.0433 ***	0.0015	0.0134***
	(4.7676)	(3.2567)	(0.2564)	(2.6946)
Experience Squared	-0.0018 ***	-0.0013 ***	----	----
	(-5.8973)	(-2.8317)		

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Table 10 (Continued)

Labor Force Outcomes for Army Spouses: Probit Estimation Results
(t-statistics)

Independent Variable	LFP	Employed	Full Time	Uses Skills
Distance	0.0709 ***	0.1319 ***	0.0412	0.0477
	(3.9402)	(4.9655)	(1.4805)	(1.6128)
Months at Location	0.0052 ***	0.0166 ***	0.0028 **	0.0052***
	(5.1522)	(9.6952)	(2.0822)	(3.7058)
Spouse Emp Program	0.2419 ***	0.0040	0.0282	-0.0887
	(6.5770)	(0.0712)	(0.4971)	(-1.4964)
Officer	-0.1022	0.1891 ***	-0.1430	0.0211
	(-1.6163)	(2.6698)	(-1.4828)	(0.2985)
Work Career	-----	-----	-----	0.2375***
				(3.5770)—
Work Needs	-----	-----	----	-0.2022 *
				(-1.8769)

*** t-statistic significant at 0.01 level
**   t-statistic significant at 0.05 level
*   t-statistic significant at 0.10 level

(-2.0) Times Log Likelihood Ratio (distributed Chi-square):

798.4975	244.7198	44.2309	124.8272
(16 d.f.)	(12 d.f.)	(12 d.f.)	(14 d.f.)

Prop > χ^2 .0001   .0001   .0001   .0001

Observations:

Dep. Var = 1	2929	2508	1534	1215
Dep. Var = 0	2555	611	810	890
Total	5484	3119	2344	2105

outcomes (i.e., in the labor force, employed, working full-time, or using her skills), given a change in each independent variable.[29]

Labor Force Participation

Three Army policy variables are found to be statistically significant factors with respect to the probability that a spouse is in the labor force. Spouses located in CONUS appear to be more likely to be in the labor force than those OCONUS. One possible explanation for the result is that Army wives in OCONUS locations have fewer opportunities for employment and drop out of the labor force as discouraged workers.[30] As expected, the length of time spent at the location is found to be positively related to labor force participation. The presence of a spouse employment program on the post is also seen to have a statistically significant and positive effect on participation.[31]

The remaining results are basically in keeping with the findings of earlier research on the labor force participation of married women.[32] The results

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[29]The coefficients indicate the direction of change in the likelihood of being in each outcome and the asymptotic t-statistics give the degree of confidence of the estimate. The magnitude of the change in probability given a change in independent variable requires simulation analysis.

[30]The 1985 DoD Survey does not contain a measure of whether the spouse is a discouraged worker. We hope to gather this information in a subsequent survey and examine the factors which are related to women who drop out of the labor force because of an inability to find work.

[31]If the labor supply decision and the presence of a spouse employment program are jointly determined, then inclusion of the variable may introduce a bias in the results. The results may be overstated if the employment program was placed at a location where the likelihood of employment was low and effectively increased the likelihood of employment. The results may be understated if the employment program was placed at a location where the likelihood of employment was low and it did not increase the likelihood of employment. These countervailing forces on the bias from including a potentially endogenous variable suggest that the results are not seriously compromised. In the absence of knowledge of the spouse employment program location decision rule, we treat program location as exogenous to the household decision of whether the wife will enter the labor force. For an interesting instrumental variables approach for when the decision rule for placement of programs is known, see Smith and Goon, 1987.

[32]For a comprehensive literature review of the theory and empirical evidence regarding factors affecting the spouse employment decision and employment outcomes, see Army Spouse Employment Literature Review (Research Triangle Institute, in preparation).

suggest that Army spouses with higher levels of education, black women, and women with children 12-17 years old are more likely to be in the labor force. The results also suggest, as expected, that women with more years of potential experience are more likely to participate, up to a point, and beyond the point, less likely. Women with pre-school children, and higher reservation wages, appear to be less likely to be in the labor force.

An increase in the husband's wage appears to decrease the likelihood that the spouse is in the labor force. This result is also consistent with previous findings and suggests that households with a greater financial need are more likely to have the spouse in the labor force.

In previous investigations, the distance to population centers has been found to have an inverse relationship with labor force participation. Our distance measure is a proxy for actual distance to population centers, with high values associated with nearness. Thus, the positive and statistically significant result found for our distance proxy suggests that the closer the household is to population centers, the more likely the spouse will be in the labor force; this result is in keeping with previous research.

Employed versus Unemployed

Compared to the specification for whether the spouse is in the labor force, the specification for employment has two major differences. First, a single variable to indicate the presence of a pre-school child in the household has been substituted for the life course stage variables. The hypothesis is that a pre-school child will increase the reservation wage, thereby decreasing the likelihood that the spouse will be observed to be employed. Older children in the household are hypothesized to affect the decision to be in the labor force (and were found to be important determinants in that model), but are not likely to be important factors in whether the woman actually finds a job.[33]

The second difference in this specification is that the husband's income has been omitted. Again, other family income was found to affect labor force participation, but there is no reason to expect that, once the woman enters the labor force, the husband's wage rate will affect the likelihood that she is employed.

With respect to policy variables, the number of months that the household has been at the present location is found to be a positive and significant factor for whether the spouse is employed. Spouse employment programs and whether the location is CONUS, however, do not appear to be statistically significant factors affecting employment. Characteristics of the individual and household, the length of time at the location, and the proximity to job

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[33]Early estimates of the model indicated that the life course variable categories for older children in the household were statistically insignificant, and they were subsequently dropped.

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opportunities appear to be the key determinants of whether the spouse is employed or unemployed.

The results suggest that Hispanic and other minority spouses are less likely to be employed than white spouses, and, as expected, women with pre-school age children appear to be less likely to be employed than those without pre-school age children.

As was the case for labor force participation, potential years of experience is found to have a statistically significant and positive effect on the likelihood of being employed up to a point and, beyond some point, the effect is negative. All else equal, it appears that the spouse of an officer is more likely to be employed than the spouse of an enlisted man. Perhaps some employers discriminate by rank of the serviceman, or perhaps officers' wives have better information networks for finding jobs. The results also suggest that households which are located closer to population centers, where jobs are likely to be more available, are more likely to have a spouse employed rather than unemployed.

Full-Time versus Part-Time Employment

For spouses who work, this model examines the likelihood of working full-time versus part-time. The specification is similar to the specification for whether the spouse is employed, the exception being that the experience squared term is deleted and husband's wage is included. While we hypothesize that potential years of experience has a positive influence on the likelihood that the spouse works full-time, we have no a priori rationale for hypothesizing that, at some point, more years of experience would lead to a lower likelihood of full-time employment. In fact, the results suggest that number of potential years of experience does not affect the probability that the spouse is a full- time worker.

We also hypothesize that spouses with husbands who earn higher salaries would be less likely to work full-time, because household financial need is less for these households. However, the results suggest that husband's earnings are not statistically significant determinants in the full-time/part-time outcome.

One policy variable, the length of time at the location, is found to be statistically significant and positive, and suggests that the longer the household is stationed in an area, the more likely the spouse is to change from part-time to full-time employment. Perhaps there is a tendency to take part-time jobs temporarily until a full-time job opportunity is available.

Other policy variables, including CONUS/OCONUS assignment and whether there is a spouse employment program available on-post, do not appear to be statistically important determinants of the likelihood that the spouse will work full-time.

The results also suggest that blacks and spouses with higher levels of education are more likely to work full-time. In addition, women with pre-school age children, who probably face day care constraints or prefer to

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have time at home with the child, appear to be more likely to work part-time, rather than full-time.

Underemployment

For spouses who work, this model examines a measure of underemployment status. The dependent variable, "uses skills", is a measure of the degree to which the spouse's job utilizes her training, experience, and skills. A woman is defined to be undcremployed if she says her current job does not utilize her training, experience, or skills.[34]

The specification is similar to the specification for whether the spouse works full-time, except in this model we have included two motivational factors for working and excluded the husband's wage, which is highly correlated with whether there is a financial need. A spouse who says she works only because the household needs her income to meet basic financial needs (work needs) is hypothesized to be more likely to accept a job which does not use her background (i.e., underemployed). On the other hand, a spouse whose primary motivation for working is for career development (work career), is hypothesized to be more selective in her choice of job, and to have a job which more closely matches her capabilities. In both cases the estimation results are consistent with the expected influence of these motivational factors, and are statistically significant.

The length of time spent at the same location is a statistically significant and positive factor of the probability of being in a job which uses acquired skills. Like finding full-time work, perhaps spouses need time to find a job (or for a job to become available) which properly matches their skills. The results suggest that those observed to be underemployed may, if given availability of jobs and enough time in the same location, be able to obtain jobs which more closely match their skills. Having the Family Member Employment Program on post and having a CONUS location do not appear to be statistically significant factors of underemployment status.

The results also suggest that spouses with higher levels of education and more experience are more likely to be in jobs which use their training and skills. Blacks and other minority spouses appear to be more likely to be underemployed in their jobs than whites.

Simulations

Table 11 presents simulations of the effects of changes in Army policy variables on work outcomes. Probabilities are estimated for hypothetical households having sample means for all independent variables, and then changes in these probabilities are determined which result from changes in specific policy variables. The simulations present the effects of changes in four independent variables on the probability of each work outcome. The changes

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[34]In future data collection and research we hope to measure and analyze underemployment more accurately.

examined are in the spouse's education, the number of months at the same location, whether a spouse employment program is available on post, and whether the household is assigned to a CONUS location.

From the information presented in Table 11, we see that if each woman in the sample had a value for each independent variable set at its sample mean for each model (see Appendix Tables A-4 through A-7), then approximately 54 percent of the spouses would be in the labor force, about 83 percent of those in the labor force would be employed, about 65 percent of employed wives would be working full-time, and about 58 percent would be in jobs which use their acquired skills.

The simulation results indicate expected changes in the average (base) probabilities that would result from changes in the explanatory variables. The magnitude of the effect of changes is best evaluated relative to the base probability of each work outcome.

The simulation results for an increase of one standard deviation in years of education of the spouse (+2.39 years) indicate an increase of .1166 in the probability that the spouse is in the labor force, or about a 22 percent increase in the base probability. Similarly, the model predicts that the increase in education would result in a .027 increase in the likelihood of full-time employment (about a 3 percent increase in the base probability), and a .0613 increase in the likelihood that the spouse is working in a job which uses her skills (about a 6.5 percent increase in the base probability). The simulated increase in education has an insignificant effect on the probability that the spouse is employed. Given that a one standard deviation increase is about an 18 percent increase in years of education, the results suggest that labor force participation is responsive (elastic) to changes in education. Conversely, increases in education appear to have an inelastic effect on the likelihood of employment, whether the spouse is working full-time, and whether she has a job which uses her skills.

An increase of one standard deviation (about 19 months) in the number of months that the household is stationed in the same location is predicted to increase the base probability of labor force participation by about 7 percent, employment by about 8 percent, full-time employment by 3 percent, and whether the spouse uses her skills in the job by about 6.5 percent. This relatively large increase in the time spent in one location (an increase of about 75 percent above the mean in each model), suggests that although a longer period of time in one location has a positive effect on work outcomes, the responsiveness of work outcomes to longer assignments is inelastic.

The effect of a spouse employment program on the base probability is simulated by examining the probability of each work outcome with and without an employment program. Spouses who have an employment program on post are predicted to be .0959 more likely to be in the labor force than spouses who do not have an employment program. As a percent of the base probability in the absence of an employment program, this result suggests that an employment

Table 11

Labor Force Outcomes for Army Spouses: Simulation Results

	LFP	Employed	Full Time	Uses Skills
Base Probability	.5371	.8268	.6538	.5811
Simulated Changes:				
Increase education by 1 std. dev. (+2.39 years)	+.1166*	+.0103	+.0270*	+.0613*
Increase number of months at same location by 1 std. dev.(+18.99 mos.)	+.0390*	+.0686*	+.0196*	+.0380*
Presence of Spouse Employment Program	+.0959*	+.0010	+.0104	-.0346
CONUS Location	+.0551*	+.0029	-.0209	+.0414

*Coefficient estimate is statistically significant at the .10 level, or better.

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program will increase the likelihood of labor force participation by nearly 20 percent. Spouse employment programs are not statistically significant factors in other work outcome models.

The simulation results indicate that spouses who are stationed in the continental U.S. are .0551 more likely to be in the labor forces. Relative to the base probability for spouses at OCONUS locations, a CONUS location increases the probability of labor force participation by about 11 percent. CONUS locations are not found to be statistically significant factors of employment, full-time employment, or underemployment.

Labor Force Status and Satisfaction with Military Life

In the previous section the determinants of Army wives' labor force outcomes were examined. The purpose of the research presented in this section is to examine the relationship between spouse labor force outcomes and satisfaction with the military way of life.

The relationship between spouse employment and retention is suggested in the White Paper 1983: The Army Family (Chief of Staff, U.S. Army, 1983) and the Army Family Action Plan I (Office of the Deputy Chief of Staff for Personnel, U.S. Army, 1984). Although spouse employment is thought to be an important factor in the member's retention decision, the link is not well established. Previous research suggests, however, that spouse opinion is a significant factor in the member's reenlistment decision (Bowen, in preparation; Pittman & Orthner, 1987). To the extent that the employment status of Army spouses affects the spouse's opinion about military life, spouse employment has the potential to affect retention indirectly through the spouse's opinion or attitude. Conversely, there is a concern that being in the Army limits a spouse's ability to pursue satisfactory employment opportunities. Then, to the extent that the spouse's employment opportunities influences her opinion about the military, there may be a negative effect on retention.

We examine the link between spouse employment and the wife's attitude toward the military way of life. The conceptual model used as the basis for the model specification is discussed in a previous section. Multivariate regression techniques are used to estimate the spouse's satisfaction with military life as a function of household economic conditions, individual characteristics, spouse employment status, and Army policy variables including child care availability, proximity to job opportunities, and relocation. The analysis is based on the Army portion of the 1985 DoD Member and Spouse Survey data.

Variable definitions and summary statistics are presented in the next section. Regression results are presented in the second section followed by simulation results.

Variable Definitions and Descriptive Statistics

The variables used in the analysis are taken from the Army Couple File described in a previous section. Table 12 provides a complete listing of all variables and definitions used in the analysis of satisfaction with military life.

The dependent variable used in the analysis is an index number ranging from 1 to 7 (very dissatisfied to very satisfied), taken from the spouse's response to a question on the level of overall satisfaction with the military as a way of life. Sample means by three levels of the index (very dissatisfied, neither satisfied nor dissatisfied, and very satisfied), and for the full sample are given in Table 13. Means, standard deviations, and the range for all of the model variables are presented in Table A-8 of the appendix.

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Table 12

Labor Force Outcomes and Satisfaction with Military Life: Variable Names and Definitions

Variable	Definition
Dependent Variable:	
Satisfied	Index of wife's satisfaction with the military as a way of life (very dissatisfied = 1, very satisfied = 7).
Independent Variables:	
Employed	Instrumental variable, estimated with probit as dichotomous variable set equal to 1 if woman is employed and zero if woman is unemployed or not in the labor force, for all women. (Estimation results given in Appendix Table A-8.)
Unemployed	Instrumental variable, estimated with probit as a dichotomous variable set equal to 1 if woman is unemployed and zero if woman is employed or not in tho labor force, for all women. (Estimation results given in Appendix Table A-8.)
Not in LF	Variable set equal to 1 if woman is not in the labor force and zero if woman is employed or unemployed, for all women (Omitted instrumental variable category).
Education	Spouse education, years of formal schooling completed.
Black	Race is black, dummy variable (1=yes, 0=no).
Hispanic	Ethnicity is hispanic or Spanish, dummy variable (1=yes, 0=no).
Other	Race is neither black, hispanic or white, dummy variable (1=yes, 0=no).
White	Race is white, dummy variable (1=yes, 0=no) (Omitted category).
Age	Age of the woman, in years.
Children	Number of children in the household.

Table 12 (Continued)

Labor Force Outcomes and Satisfaction with Military Life: Variable Names and Definitions

Variable	Definition
CONUS	Geographic location is continental U.S., dummy variable (1=yes, 0=no).
Distance	Spouse rating of distance to population centers, 1 is very poor (long distance) and 5 is excellent (very close).
Husband's Wages	Member's annual taxable military income, in thousands.
PCS Moves	Number of times had Permanent Change of Station.
Child Care Program	Child core services are available on post, dummy variable (1=yes, 0=no).
Officer	Husband is an officer, dummy variable (1=yes, 0=no).

Table 13

Labor Force Outcomes and Satisfaction with Military Life: Means by Level of Satisfaction

Variable	Very Dissatisfied	Neither Dissatisfied nor Satisfied	Very Satisfied	All
Satisfaction	1.0000	4.0000	7.0000	4.6870
Employed	0.4493	0.4161	0.4583	0.4352
Unemployed	0.1093	0.1108	0.0927	0.1054
Education	13.1713	12.8631	13.2857	13.1542
CONUS	0.6848	0.6714	0.7189	0.6871
Husband's Wages	19.6644	18.4878	24.0555	20.2344
Age	31.1544	30.0530	33.8833	31.2318
Black	0.1456	0.1576	0.1449	0.1580
Hispanic	0.0573	0.0995	0.0564	0.0723
Other	0.0883	0.1667	0.0548	0.0945
PCS Moves	3.6740	3.3713	4.6968	3.8729
Child Care Program	0.6327	0.6881	0.7384	0.7133
Children	1.4843	1.5168	1.6379	1.5996
Distance	3.6724	3.6371	3.9429	3.7447
Officer	0.3113	0.2575	0.4569	0.3369

The statistics shown in Table 13 indicate that the mean level of satisfaction with military life is about 4.7 and indicates that, on average, Army wives are somewhat satisfied (4 indicates neither satisfied nor dissatisfied and 5 indicates somewhat satisfied). The average probability of being employed is about .44 and the average probability of being unemployed is about .11, indicating the average probability of not being in the labor force (the excluded category) is about .45.[35]

About 71% of the sample has access to child care services on the Army base, about 69% are located in CONUS and the average number of PCS moves is about 3.9 moves. The average spouse is about 31 years old with 13 years of education and has a husband (member) who earns about $20,000 per year.

The average probability of being employed is about the same for wives who are very dissatisfied (44.9%) and for those who are very satisfied (45.8%), and slightly lower for those who are neither dissatisfied nor satisfied (41.6%). The mean probability of being unemployed is about 11 percent for wives who are very dissatisfied and for those who are neither dissatisfied nor satisfied, and about 9 percent for those who are very satisfied with military life.

A higher percent of women who are very satisfied with military life are at CONUS locations (72%) than either of the other two lesser categories of satisfaction (about 68%). Women who are very satisfied have had a higher average number of PCS moves (about 4.7) than women who are very dissatisfied (about 3.7), and women who are neither dissatisfied nor satisfied (about 3.4). About 45 percent of the women who report they are very satisfied with military life are married to officers compared to about 31 percent of those who are very dissatisfied, and 26 percent who are indifferent.

The sample means also indicate that average husband's wages are higher for wives who are very satisfied with military life ($24,056) compared to women who are very dissatisfied with military life ($19,600), and those who are neither dissatisfied nor satisfied ($18,488).

Women who are very satisfied with military life have a higher average number of children (1.6) than those who are neither dissatisfied nor satisfied (1.5), and those who are very dissatisfied (1.4). About 73 percent of wives who are very satisfied have child care programs on base which is higher than for those who are neither satisfied nor dissatisfied (69%), and very dissatisfied (63%).

Women who are very satisfied are older on average (about 34 years old) than women who are neither dissatisfied nor satisfied (about 30 years old), and women who are very dissatisfied (about 31 years old). The average number of

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[35]Note that the employment status variables are instruments created from first stage probit equations, and therefore represent the probability of each woman being in each employment status category.

years of education of spouses is about the same (about 13 years) for the three
levels of satisfaction.

Results

The results of the probit estimations used to create instrumental variables
for being employed and unemployed, including estimated coefficients,
t-statistics and log likelihood ratios are contained in Appendix Table A-9.
Each of the estimations is performed using the entire sample of women. That
is, status as employed versus all others (both those unemployed and those not
in the labor force) is estimated. A similar estimation is performed for
status as unemployed versus all others.

Fitted values obtained from these estimations are included as independent
variables in the spouse satisfaction model and represent the probability of
being employed and unemployed for each woman in the sample. Because being
employed, unemployed, or not in the labor force is known to be related to many
of the same variables which are expected to have a direct effect on spouse
satisfaction with military life,[36] instrumental variables are constructed in
order to control for the indirect effects of these variables which may operate
through employment status.

The results of the ordinary least squares (OLS) estimation for the Army
spouse's satisfaction with military life including coefficient estimates, t-
statistics, and adjusted R-squares are presented in Table 14. In general, the
coefficients represent the change in the level of satisfaction given a change
in each of the independent variables.

The results suggest that being unemployed as well as several Army policy
variables are important in determining Army wives' satisfaction with the
military as a way of life. The probability of being unemployed is found to be
a statistically significant and negative determinant of satisfaction, and the
probability of being employed is found to be a statistically insignificant
determinant of satisfaction. That is, it appears that spouses who are
unemployed and looking for a job are less satisfied with the military way of
life. However, being employed does not appear to affect satisfaction. A
plausible explanation for these results is that women who are unemployed tend
to attribute part of their inability to find a job to military life in
general, but once employed other factors are more important in the way they
feel about the military way of life.

The husband's (member's) wage has a statistically significant positive
relationship with satisfaction. This finding suggests that the direct effect
of an increase in the husband's wage would tend to increase the wife's
satisfaction with the military way of life. In addition, the husband's wage
is a statistically significant and negative factor of being unemployed. That
is, women whose husbands have higher wages are more likely to either be
employed or not in the labor force. Because being unemployed is seen to have

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[36]See the previous section, "Labor Force Outcomes for Army Spouses."

Table 14

Labor Force Outcomes and Satisfaction with Military Life: OLS Estimation
Results (t-statistics)

Independent Variable	Satisfaction Index
Intercept	3.8041 *** (18.121)
Employed	-0.2130 (-1.195)
Unemployed	-1.0596 * (-1.821)
Education	-0.0408 *** (-2.874)
CONUS	0.0646 (1.405)
Husband's Wages	0.0129 ** (2.474)
Age	0.0255 *** (5.306)
Black	0.2570 *** (3.218)
Hispanic	0.1367 (1.623)
Other	-0.2598 *** (-3.265)
PCS Moves	-0.0202 ** (-2.057)
Child Care Program	0.2028 *** (4.182)
Children	-0.0034 (-0.152)

Table 14 (Continued)

Labor Force Outcomes and Satisfaction with Military Life: OLS Estimation
Results (t-statistics)

Independent Variables	Satisfaction Index
Distance	0.1137 ***
	(4.769)
Officer	0.1136
	(1.301)

*** t-statistic significant at .01 level
 ** t-statistic significant st .05 level
  * t-statistic significant at .10 level

F	17.967 (14 d.f.)
Prob > F	.0001
Adjusted R-square:	0.0408

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a negative effect on satisfaction, an increase in member wages would also be expected to increase satisfaction through the indirect effect of wages on being unemployed.

The presence of child care services on post is also found to be a statistically significant and positive factor of satisfaction and suggests that the placement of child care centers on post tends to improve spouse satisfaction. It was expected that because a larger number of children increases the benefits that a family receives from the military, larger family size would be positively related to wife satisfaction with military life. However, number of children was found to be statistically insignificant and does not confirm the expected relationship. Perhaps the benefits received by a family for additional children do not compensate enough for the costs of additional children to be related to satisfaction with the military.

The number of Permanent Change of Station (PCS) moves is a statistically significant and negative determinant of satisfaction. The results suggest that decreasing the number of PCS moves would increase spouse satisfaction with military life.

The wife's satisfaction with the location of the household with respect to the distance to population centers, where a high "distance" value indicates a high level of satisfaction, is found to be a statistically significant and positive factor of satisfaction with military life. This direct effect suggests that spouses who are satisfied with the proximity to population centers tend to be more satisfied with military life. In addition, there is an indirect effect of distance to population centers which acts through spouse employment status. Satisfaction with the location of the household is found to be negatively related to being unemployed, and suggests that wives who are closer to population centers are less likely to be unemployed and also, therefore, tend to be more satisfied with military life.

Other individual characteristics of Army wives are also seen to be related to satisfaction with military life. Age is found to be a statistically significant and positive determinant of satisfaction. The result suggests that older women are more satisfied with the military way of life. It should be noted however, that this result may be biased because older women represent households generally satisfied with military life as a career. Women in households that are not satisfied with military life are likely to have left the military when the women were younger. Education is found to be a statistically significant and negative factor of satisfaction. More highly educated women appear to be less satisfied with military life, all other factors held constant.

Simulations

Simulation results for unemployment status and three Army policy variables are presented in Table 15. The simulations present the effects of changes in the independent variables on the spouse's satisfaction level with the military as a way of life. We examine the independent effect of being unemployed, having child care services on post, decreasing the number of PCS moves, and increasing the husband's wages. Both the change in the base (average)

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Table 15

Labor Force Outcomes and Satisfaction With Military Life: Simulation Results

	Satisfaction Index	Percent Change
Base Satisfaction Index	4.7058	----
Simulated Changes:		
Unemployed	-1.0596*	-22.06%
Child Care Program	+0.2028*	+4.45%
PCS moves decreased by one	+0.0202*	+0.43%
Husband's wages increased by $1,000/year	+0.0166*	+0.35%

*Coefficient estimate is statistically significant at the .10 level, or better.

satisfaction index and the percentage change in the base are shown in Table 14. From Table 15 we see that if each woman in the sample had a value for each independent variable set at its sample mean then the base level of overall satisfaction with military life would be 4.7058 which indicates that an average woman is somewhat satisfied with military life.

The simulation results indicate that the independent effect of being unemployed accounts for about a 22% decrease in the base satisfaction index of military life. The result suggests that spouse attitudes are very responsive to changes in unemployment status and that programs aimed at decreasing spouse unemployment could be very useful in increasing spouse satisfaction with military life.

Other simulated changes appear to have relatively small effects on spouse satisfaction with military life. The model predicts that a change from having no child care services on post to having child care services on post would increase spouse satisfaction by 4.45%. A decrease in the number of PCS moves by one move would increase satisfaction by 0.43%. A $1000/yr. increase in husband's wages is seen to increase spouse satisfaction by 0.35%, including both the direct effects of wages on satisfaction and the indirect effect of wages operating through employment status.

Conclusions and Recommendations

The research presented in this report has made use of existing survey data to compare employment outcomes for spouses of military personnel and civilians and to explore in more depth the Army life factors that affect spouse employment and, in turn, the relationship between spouse employment and satisfaction with the military as a way of life. The research represents the beginning of a continuing program of research on Army spouse employment. Major findings, policy and program implications, and implications for future research are presented in the following paragraphs.

Major Findings

Results based on analysis of census data suggest that military wives are less likely to participate in the labor force than comparable civilian wives, perhaps because they drop out of the labor market as discouraged workers, or perhaps because they change locations so frequently they are more likely to be temporarily out of the labor force. The relatively high unemployment rate of military wives may also be related to the frequency of relocation (although the magnitude of the effect of this factor is of moderate size) and subsequent search time to find employment, and perhaps to a reluctance on the part of employers to hire women whom they expect to be temporary residents.

The results also suggest that military wives do not earn significantly different wage rates or annual incomes compared to civilian wives, after controlling for other individual and household differences. Thus, wage discrimination does not appear to be a problem for military wives. However, frequent relocation and being located away from large population centers, both facts of military life, appear to negatively affect the earnings of military wives when compared to civilians.

Other characteristics of military wives which are significantly different from those of civilian wives are seen to contribute to lower observed labor force participation rates, higher unemployment rates, and lower earnings. In particular, the younger ages and younger children of military wives appear to be important factors of observed work outcome differentials relative to civilian wives.

Results based on analysis of the 1985 DoD Survey data suggest that spouse employment programs may significantly increase the labor force participation rate of Army wives. The results indicate that for the amount of time that households are stationed in the same location suggest that labor force participation and employment are relatively insensitive to this factor. Being located in CONUS rather than OCONUS appears to have a moderate positive effect on labor force participation. The results also suggest that increases in education are likely to increase labor force participation of Army wives.

The results further suggest that spouse satisfaction with the military way of life is very responsive to differences in employment status. Child care services on base appear to have a moderate positive effect on spouse attitudes toward the military. The effect of an increase in husband wages on spouse satisfaction with military life is positive, but attitudes are relatively

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insensitive to this factor. Finally, a decrease in the number of Permanent Change of Station (PCS) moves has a relatively small positive effect on spouse attitudes.

Policy and Program Implications

The preliminary results based on secondary analyses have important implications for current Army policy and programs. Programs designed to identify job opportunities and increase placement of Army wives, particularly following a relocation to a new area, are clearly suggested by the results of the research. Moreover, spouse employment programs specifically aimed at increasing employment opportunities for unemployed Army wives would be expected to significantly increase spouse satisfaction with military life, and perhaps to have a positive effect on retention.

Policies that decrease the number and frequency of relocations over the career of the military husband may also improve spouse labor force participation, employment and satisfaction with the military way of life. In addition, a policy or program designed to increase the job skills and education of Army wives would be expected to increase the employment opportunities for spouses, especially for spouses of junior enlisted personnel.

Implications for Future Research

The results presented in this report, the limitations imposed by secondary analysis of existing data, and the objectives of the Army Family Research Program (AFRP) all have implications for further research on spouse employment. This research needs to proceed on two "tracks": (1) research designed to increase understanding of the relationship of spouse employment to Army life conditions and key military outcomes; and (2) spouse employment program/policy review and evaluation.

Research is needed on several major topics. These include:

o   Spouse employment success (factors that contribute to success; problems of unemployment, underemployment and "discouraged workers"; and the length of spells of employment and unemployment associated with PCS moves and other Army life conditions);

o   Army spouse job/career patterns over the family life course and soldier career cycle (spouse work histories; job/career goals and development: and the interplay of family, soldier career, and spouse career development);

o   Further refinement of earnings estimates for wives as civilians versus Army spouses for integration into retention modeling; and

o   The relationship of spouse job/career development and outcomes to family strength/wellness, readiness, and retention.

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Secondary analysis of data from such sources as the Current Population Survey (CPS), the 1985 DoD Surveys of Officer and Enlisted Personnel, and the Annual Survey of Army Families 1987 Spouse Survey can be used for preliminary analyses of these issues, and to establish a baseline for subsequent data collection and analysis of change over the coming years.

The second track of the project work will undertake two program review and evaluation sub-tasks aimed at improving Army policies and programs to improve spouse employment opportunities and better prepare spouses to obtain employment. These are: (1) recommend changes or interventions, based on a review of Army and other policies/programs; and (2) once the Army has selected an intervention for implementation, design and implement an evaluation of the intervention.

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APPENDIX A

SUPPLEMENTARY TABLES

Table A-1

Comparison Between Military and Civilian Spouses: Labor Force
Participation Model Means

Variable	Not In Labor Force	In Labor Force	All
Age	32.5052	33.0098	32.8409
Age Squared	1103.3924	1135.2124	1124.5628
Education	12.2978	13.1444	12.8610
Black	0.0376	0.0625	0.0542
Hispanic	0.1263	0.0817	0.0966
Hus Earnings	27.4621	24.7030	25.6264
No. Families in HH	1.0473	1.0354	1.0394
Hus in Prof Occupation	0.2564	0.2873	0.2770
Hus Tech/Sales Occ	0.1581	0.1991	0.1854
Hus in Service Occ	0.0596	0.0657	0.0637
Hus in Labor Occ	0.4429	0.3946	0.4108
Young Child Age 0-2	0.3762	0.1953	0.2559
Young Child Age 3-5	0.1882	0.1371	0.1542
Young Child Age 6-11	0.1945	0.2105	0.2051
Young Child Age 12-17	0.1154	0.1629	0.1470
Young Child 18+	0.0778	0.1499	0.1257
Moved in Past 5 Years	0.2643	0.2206	0.2352
New England Region	0.0689	0.0843	0.0792
Mid-Atlantic Region	0.1451	0.1202	0.1285
East North Cen Region	0.1409	0.1390	0.1396
West North Cen Region	0.0830	0.1104	0.1013
South Atlantic Region	0.1375	0.1604	0.1527
East South Cen Region	0.0556	0.0472	0.0500
West South Cen Region	0.1045	0.0960	0.0989
Mountain Region	0.1101	0.0995	0.1030
Husband in Military	0.0449	0.0245	0.0313
Metropolitan Area	0.3611	0.3414	0.3479
Central City	0.1921	0.1827	0.1858

Table A-2

Comparison Between Military and Civilian Spouses: Employment Model
Means

Variable	In Labor Force, Not Employed	In Labor Force, Employed	All
Age	31.1640	33.1158	33.0098
Age Squared	1022.4637	1141.6820	1135.2124
Education	12.0158	13.2092	13.1444
Black	0.1041	0.0601	0.0625
Hispanic	0.1262	0.0792	0.0817
Managerial Occ	0.0599	0.0866	0.0852
Professional Occ	0.0315	0.0671	0.0651
Health Occ	0.0142	0.0448	0.0431
Teaching Occ	0.0205	0.0774	0.0743
Technician Occ	0.0347	0.0382	0.0380
Sales Occ	0.1356	0.1134	0.1146
Clerical Occ	0.2224	0.3125	0.3076
Service Occ	0.1656	0.1395	0.1409
Manufacturing Occ	0.2066	0.0827	0.0894
Young Child Age 0-2	0.2508	0.1921	0.1953
Young Child Age 3-5	0.1609	0.1358	0.1371
Young Child Age 6-11	0.2066	0.2107	0.2105
Young Child Age 12-17	0.1388	0.1643	0.1629
Young Child 18+	0.1151	0.1519	0.1499
Moved in Past 5 Years	0.3028	0.2159	0.2206
New England Region	0.0647	0.0854	0.0843
Mid-Atlantic Region	0.1167	0.1204	0.1202
East North Cen Region	0.1577	0.1379	0.1390
West North Cen Region	0.0820	0.1120	0.1104
South Atlantic Region	0.1498	0.1610	0.1604
East South Cen Region	0.0757	0.0455	0.0472
West South Cen Region	0.1120	0.0951	0.0960
Mountain Region	0.0946	0.0997	0.0995
Husband in Military	0.0678	0.0220	0.0245
Metropolitan Area	0.3076	0.3433	0.3414
Central City	0.1656	0.1836	0.1827

Table A-3

Comparison Between Military and Civilian Spouses: Earnings Models
Summary Statistics

Variable	Mean (N=10017)	Standard Deviation
Age	33.0263	6.7027
Age Squared	1135.6546	443.5213
Education	13.2396	2.3807
Black	0.0643	0.2453
Hispanic	0.0792	0.2700
Full Time	0.5527	0.4972
Self-Employed	0.0276	0.1637
Part Time & Self-Employed	0.0164	0.1269
Managerial Occupation	0.0879	0.2831
Professional Occupation	0.0666	0.2493
Health Occupation	0.0479	0.2136
Teaching Occupation	0.0801	0.2714
Technician Occupation	0.0413	0.1991
Sales Occupation	0.1075	0.3098
Clerical Occupation	0.3260	0.4688
Service Occupation	0.1231	0.3286
Manufacturing Occupation	0.0868	0.2815
Youngest Child Age 0-2	0.1871	0.3900
Youngest Child Age 3-5	0.1328	0.3393
Youngest Child Age 6-11	0.2087	0.4064
Youngest Child Age 12-17	0.1643	0.3706
Youngest Child 18+	0.1538	0.3608
Moved in Past 5 Years	0.2157	0.4114
New England Region	0.0869	0.2816
Mid-Atlantic Region	0.1222	0.3275
Eastern North Central Region	0.1404	0.3474
Western North Central Region	0.1113	0.3145
South Atlantic Region	0.1640	0.3703
Eastern South Central Region	0.0453	0.2080
Western South Central Region	0.0922	0.2894
Mountain Region	0.0971	0.2962
Metropolitan Area	0.3476	0.4762
Central City	0.1856	0.3888
Husband in Military	0.0207	0.1423
Mills Ratio	0.7093	0.4582

Table A-4

Labor Force Outcomes For Army Spouses: Labor Force Participation
Model Means

Variable	Not In Labor Force	In Labor Force	All
Education	12.8967	13.5654	13.2538
Black	0.0798	0.1717	0.1289
Hispanic	0.0736	0.0608	0.0667
Other	0.1084	0.0703	0.0881
Child 0-5	0.5722	0.3503	0.4537
Child 6-11	0.1930	0.2571	0.2272
Child 12-17	0.0853	0.1550	0.1225
Child 18+	0.0732	0.1031	0.0892
CONUS	0.6654	0.6931	0.6802
Hus Wages	20.7264	20.1431	20.4148
Distance	3.6818	3.7948	3.7422
Months at Loc	22.5174	25.7002	24.2174
Spse Emp Prg	0.4814	0.5906	0.5398
Officer	0.3746	0.3479	0.3603

Table A-5

Labor Force Outcomes For Army Spouses: Employment Model Means

Variable	Unemployed	Employed	All
Black	0.2095	0.1643	0.1731
Hispanic	0.0851	0.0538	0.0600
Other	0.0949	0.0682	0.0734
CONUS	0.6694	0.6978	0.6922
Education	13.2635	13.6248	13.5540
Child 0 - 5	0.4337	0.3034	0.3290
Distance	3.5646	3.8636	3.8051
Months at Loc	17.9018	27.7257	25.8012
Spse Emp Prg	0.6121	0.5865	0.5915
Officer	0.2520	0.3660	0.3437
Exp Squared	165.7921	205.7301	197.9064
Experience	11.0098	12.7963	12.4463

Table A-6

Labor Force Outcomes For Army Spouses: Full Time Work Model Means

Variable	Part Time	Full Time	All
Education	13.5988	13.6307	13.6197
Experience	12.6691	12.8875	12.8122
Spouse Employ- ment Program	0.5802	0.6027	0.5950
Distance	3.8148	3.8771	3.8556
Child 0 - 5	0.3432	0.2620	0.2900
Months at Location	26.2667	28.3882	27.6563
CONUS	0.7111	0.6873	0.6955
Officer	0.3938	0.3394	0.3582
Hus. Wages	21.1734	20.4676	20.7111
Black	0.1481	0.1812	0.1698
Hispanic	0.0580	0.0528	0.0546
Other	0.0679	0.0717	0.0739

Table A-7

Labor Force Outcomes For Army Spouses: Underemployment Model Means

Variable	Does Not Use Skills	Uses Skills	All
Education	13.3292	14.0058	13.7197
Black	0.1697	0.1309	0.1473
Hispanic	0.0404	0.0584	0.0508
Other	0.0888	0.0477	0.0651
CONUS	0.6831	0.7342	0.7126
Distance	3.8079	3.9300	3.8784
Experience	12.4798	13.1720	12.8793
Officer	0.3281	0.4255	0.3843
Spouse Employ- ment Program	0.6157	0.5531	0.5796
Child 0 - 5	0.3011	0.2856	0.2922
Work Career	0.5876	0.6955	0.6499
Work Needs	0.1180	0.0683	0.0893
Months at Location	25.6258	29.4996	27.8618

Table A-8

Labor Force Outcomes and Satisfaction with Military Life:
Summary Statistics

Variable	Mean	Standard Deviation	Minimum Value	Maximum Value
Satisfaction	4.6870	1.5946	1.0000	7.0000
Employed	0.4352	0.1729	0.0419	0.9631
Unemployed	0.1054	0.0568	0.0008	0.3644
Education	13.1542	2.2390	1.0000	20.0000
CONUS	0.6871	0.4637	0.0000	1.0000
Hus. Wages	20.2344	9.9161	3.7460	83.9570
Age	31.2318	6.9215	13.0000	63.0000
Black	0.1580	0.3647	0.0000	1.0000
Hispanic	0.0723	0.2589	0.0000	1.0000
Other	0.0945	0.2926	0.0000	1.0000
PCS Moves	3.8729	2.9716	0.0000	10.0000
Child Care	0.7133	0.4522	0.0000	1.0000
Children	1.5996	1.1185	0.0000	4.0000
Distance	3.7447	1.0009	1.0000	5.0000
Officer	0.3369	0.4727	0.0000	1.0000

Table A-9

Labor Force Outcomes and Satisfaction with Military Life: Probit
Estimation Results (t-statistics) For Employed and Unemployed
Instrumental Variables

Independent Variable	Employed	Unemployed
Intercept	-1.8524 ***	-1.1001 ***
	(-11.553)	(-5.297)
Education	0.1111 ***	0.0439 ***
	(12.244)	(3.727)
CONUS	0.1090 ***	0.0452
	(2.858)	(0.906)
Husband's Wages	-0.0142 ***	-0.0129 ***
	(-4.385)	(-2.761)
Age	-0.0030	-0.0012
	(-0.760)	(-0.219)
Black	0.2558 ***	0.2858 ***
	(4.898)	(4.542)
Hispanic	-0.1963 ***	0.1489 *
	(-2.748)	(1.712)
Other	-0.1461 **	0.0699
	(-2.281)	(0.857)
Spouse Employment Program	0.1954 ***	0.1309 ***
	(5.481)	(2.758)
Youngest Child 0-2	-0.6109 ***	-0.0493
	(-12.401)	(-0.774)
Youngest Child 3-5	-0.0232	0.0316
	(-0.398)	(0.400)
Youngest Child 6-11	0.2416 ***	0.0034
	(3.300)	(0.327)
Youngest Child 12-17	0.0090	0.1888 *
	(0.115)	(1.849)
Distance	0.1108 ***	-0.0773 ***
	(6.292)	(-3.449)

Table A-9 (Continued)

Labor Force Outcomes and Satisfaction with Military Life: Probit
Estimation Results (t-statistics) For Employed and Unemployed
Instrumental Variables

Independent Variable	Employed	Unemployed
Officer	-0.0298 (-0.490)	-0.1257 (-1.480)
Months at Location	0.0100 *** (10.415)	-0.0124 *** (-8.314)

*** t-statistic significant at .01 level
 ** t-statistic significant at .05 level
  * t-statistic significant at .10 level

(-2.0) Times Log Likelihood Ratio (distributed Chi-square):

	Employed	Unemployed
	758.36 (15 d.f.)	206.87 (15 d.f.)
Prob $> \chi^2$	.0001	.0001
Observations:		
Dep Variable=0	3312	5250
Dep Variable=1	2556	618
	-----	-----
Total	5868	5868