The Impact of Married Women's Employment on Household Expenditures for Clothing

by

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Dissertation submitted to the Faculty of the

Virginia Polytechnic Institute and State University

in partial fulfillment of the requirements for the degree of

Doctor of Philosophy

in

Clothing and Textiles

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June, 1987

Blacksburg, Virginia

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(ABSTRACT)

The objective of this research was to analyze the impact of wives' employment status and occupation on household expenditures for clothing, when controlling for income and various sociodemographic variables.

The sample consisted of 2,285 households selected from the public use tapes of the Quarterly Interview component of the 1980-81 Consumer Expenditure Survey conducted by the Bureau of Labor Statistics.

A four-stage econometric analysis of the data included: (1) probit analysis to obtain predicted probabilities of wives' labor force participation; (2) tobit analysis to predict wives' wage rates; (3) tobit analyses of six separate clothing expenditure models that contained predicted values from (1) and (2); and (4) tobit analysis of a clothing expenditure model that contained predicted values from (2) in addition to dummy variables for wives' occupations.

The predicted probability of the wife's employment status was not significant in explaining expenditures for household, women's, boy's, or infant's clothing. Expenditures for men's clothing were positively affected by an increase in the predicted probability of the wife's employment, while expenditures for girl's clothing were negatively impacted by an increase in the predicted probability. Households with women employed in Professional, Traditional, or Uniformed occupations exhibited higher expenditures for clothing than did households with women who were homemakers.

Acknowledgements

This dissertation is the cumulative product of the generosities of many individuals. I owe an enormous intellectual and personal debt of gratitude to Dr. Marjorie Norton, my advisor and major professor, of the Department of Clothing and Textiles at Virginia Tech. I have received an education, not just a degree, as a result of my association with Dr. Norton, and I am deeply grateful. I wish to thank Dr. Barbara Densmore, Dr. Mary Helen Marshall, and Dr. Enid Tozier, also of the Department of Clothing and Textiles, for their willingness to serve on my committee and their contributions to this effort.

I am indebted to Dr. Thomas Johnson, of the Department of Agricultural Economics at Virginia Tech, for his enthusiastic support and invaluable guidance throughout the research process. Thanks are also in order to Dr. George Norton of the Department of Agricultural Economics for his contributions as a committee member.

I have benefited enormously from the informal contributions of several individuals whom I wish to thank here: Dr. Oral "Jug" Capps, now of the Department of Agricultural Economics at Texas A & M; Dr. W. Keith Bryant, of the Department of Consumer Economics and Housing at Cornell University; and Patricia Norris, a doctoral candidate in Agricultural Economics at

Virginia Tech. These individuals have given generously of their time and expertise, and I am sincerely grateful.

Without the programming skills of Tom Finn, formerly of the College of Agriculture and Life Sciences Microcomputer Teaching Lab at Virginia Tech, this research would not have been possible. I am grateful to Jerry Spittle, Director of the Lab, for making it possible for me to avail myself of Tom's time and unparalleled expertise.

I would like to take this opportunity to thank Dr. S. J. Ritchey, Dean of the College of Human Resources at Virginia Tech, for his unfailing support of me and my efforts over the course of my years at Virginia Tech.

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Chapter 1. Introduction

American women have been steadily increasing their numbers in the paid labor force since the first world war. The adjustments that these employed women make in order to take on the responsibilities of paid employment, in addition to those of the unpaid jobs that they usually already possess (those of managing homes and families), are often overlooked. The interest in the impact of wives obtaining paid employment often focuses on the changes in the consumption patterns of their families, not in the ability of the employed wife to adjust her work schedule to accommodate an additional job.

This research attempts to explain the clothing expenditure patterns of employed-wife households by recognizing that paid employment increases the need for judicious time use and management by the employed wife.

Background

The number of women in the American labor force increased by 173% between 1947 and 1980. Women aged 45 to 64 were responsible for most of the increase in women's labor force participation during the 1950s (Bureau of the Census, 1984, p. 15). But women in their primary childbearing and childrearing years, 20 to 44, were responsible for the greatest increase in women's labor force participation in the 1960s and 70s (Bureau of the Census, 1984, p. 17).

As of January, 1986, nearly 45 million women, or 51.6% of all women at least 20 years old, were employed in the civilian labor force in this country (Bureau of Labor Statistics, 1986, p. 63). The United States Department of Labor, Bureau of Labor Statistics predicts that women will account for 60% of the growth in the U.S. labor force into the mid-1990s. The Bureau of Labor Statistics (BLS) also estimates that labor force participation among women aged 25 to 44 will exceed 80% by 1995 (Fullerton, 1985, p. 17).

Less than one-fifth of women with preschool-aged children were in the labor force in the 1950s, but by the early 80s this fraction had risen to almost one-half (Bureau of the Census, 1984, p. 1). In 1981, 44% of wives who had children less than 18 years old worked in the labor market year round, full time (BLS, 1983a, p. 6). By 1985 over 49% of married women whose youngest child was less than one year old were employed outside the home (Hayghe, 1986, p. 44).

More American women are employed in clerical occupations (35%) than in any other occupational classification. The next largest occupational groups of women are service workers (17%) and professional-technical workers, also 17% (BLS, 1983b, p. 13). Of those women who are classified as professionals, nearly half are nurses or noncollege teachers (Rytina and Bianchi, 1984, p. 14). Despite these facts, there has been a growing perception since the mid-1970s, fostered in part by books such as John T. Molloy's 1977 best seller *The Woman's Dress for Success Book*, that a "working woman" is a white-collar, career professional.

During the years 1980-81 (the years during which the data for this research were collected) the magazine *Working Woman*, which began publication in 1976, printed thirteen articles on various aspects of corporate dressing for women. These articles use the term "working woman" synonymously with female career professionals. During the same years, 1980-81, the apparel trade journal *Retailweek* printed six articles dealing with marketing strategies aimed at professional women, and two that addressed the issue of marketing maternity wardrobes to employed pregnant professionals.

Research in the clothing field itself has mirrored this attention to the professional woman. Lists of thesis and dissertation titles published in the early to mid-1980s by the *Home Economics Research Journal* contain an average of four titles per year that address clothing issues as they relate to career- and success-oriented professional women. Similar lists published in the early to mid-70s contain no titles on this subject.

Before the recent interest in the clothing use and needs of professional women, most clothing research that addressed the issue of occupation did so only with respect to the occupation of the husband. As more and more married women enter the labor market, it is important to correctly identify the impact of women's occupational status so that the clothing consumption behavior of families with employed women can be studied realistically.

It is intended that this research will shed light on the clothing budgets of two-parent households by analyzing the impact of wives' employment status and occupations on levels of household expenditures for clothing when controlling for income and various sociodemographic variables. Besides providing information about the clothing consumption behavior of employed-wife families, this research may be useful to individuals and agencies seeking data that could be used as reference standards for determining clothing budgets for other types of families and households.

The Problem

Employed women, to a greater or lesser extent depending on occupation and employer/workplace expectations, may have to spend some of their earned income on clothes for work. But it has been shown that employed-wife households in general have higher consumption-to-income ratios than do households where the wife is not employed (Strober, 1977). This higher consumption-to-income ratio may be due, in part, to the employed-wife households' purchase of "time-saving" goods and services and to their purchase of market substitutes for the now relatively higher time cost home produced goods and services.

Although clothing often is categorized as a nondurable, it is a durable or semidurable good since it is not "used-up" at acquisition or, except in rare cases, after one use. The clothing consumption process is a set of events that starts with acquisition, includes use (wearing), care and repair (maintenance) and storage, and ends with discard (Winakor, 1969). Typically, acquisition and maintenance are the most labor intensive phases of the clothing consumption process. Since, in general, employed wives still maintain primary responsibility for running the household (Stafford, 1980), a family's clothing inventory level may be in response to constraints on the wife's time. It may be the case that larger inventories of clothing for *all* family members allow the employed wife to schedule more efficient use of her time in maintenance of family clothing stocks. This is in contrast to other labor intensive household work such as child care and meal preparation and clean-up, work that typically cannot be delayed or "saved-up" for a more convenient (or more efficient use of) time.

Justification

The need for research by home economists in the area of household consumption of clothing and textiles is frequently cited. The 1978 report, *Home Economics Research Assessment, Planning and Projections* (Ritchey, p.67), states that "much of the available information about spending for clothing and textiles is based on production and marketing statistics which do not reflect the situation at the family level." In 1986 Winakor emphasized that "there is a need for detailed understanding of all aspects of consumption within the household-- food, clothing, housing, child care services, consumer durables, and so on."

The results of this research may have implications for entities outside of the family that are affected by the clothing consumption behavior of families, e.g., producers, marketers, retailers, advertisers, and clothing service providers. However, since the mission of home economics is to improve or assure the quality of life for individuals and families, it is the implications for families and individuals within families that will be addressed here.

Typically, when married women work outside the home there is no major reallocation of responsibilities within the family; most employed wives must cope with being wage or salary earners as well as unpaid house workers (Levitan & Belous, 1981). However, from the viewpoint of positive economics (dealing with "what is" apart from value judgments about what "should be") it can be assumed that employed-wife families acquire inventories of clothing that they have determined to be of the right level for their budgets and household needs. If this assumption is correct, that these "intact" families have established for themselves the level of clothing consumption that is a constrained optimum, then families that are headed by a female parent without a spouse present may find that their ability to maintain their established level of clothing consumption, as well as that of other goods and services, has diminished.

Between 1972 and 1982 the number of families maintained by women increased by 57%, compared with a 10% increase of other family types (BLS, 1983a, p. 24). By 1984, households headed by women with one or more children less than 18 years old, made up 19% of all family types (Bureau of the Census, 1985, p. 46).

At the same time that the proportion of households headed by women has increased, the relative economic status of these households has declined (Bureau of the Census, 1984, p. 24). Women generally earn less than men, and women raising children by themselves often are not awarded child support (Bureau of the Census, 1984, p. 26).

In 1981, one of every three families maintained by women was living in poverty (Bureau of the Census, 1984, p. 24). By 1985, 54% of children living in female headed households who were less than 18 years old (6.8 million children) were living below the poverty level (Bureau of the Census, 1985, p. 458). The economic well-being of these women and children should concern government and civic officials and policy makers. Making recommendations and implementing policy about what "should be" with respect to clothing allowances in child support litigation, foster care payments, or clothing stocks for children in group homes, comes under the rubric of normative (prescriptive) economics.

The U. S. Department of Labor no longer prepares standard family budgets, and in 1986 there were no government agencies supporting research that could supply normative information about consumption, except for food (Winakor, 1986). Therefore, in addition to providing information about the clothing consumption behavior of employed-wife families, the results of this research may prove useful to agencies in need of data that establish levels of expenditure on clothing in two-parent households. These data on intact families could be used as reference standards for stabilizing the welfare of families in crisis or transition.

Research Objective

The objective of this research was to determine the relationship, and the nature of the relationship, between married women's employment and household expenditures for clothing.

The analysis was designed to determine how income, wife's employment, wife's occupation, and various other sociodemographic variables affect the household's expenditure for clothing.

Framework

Winakor's (1969) model of clothing consumption (encompassing acquisition, storage, use, maintenance, and discard) provides a framework within which household clothing consumption activities can be analyzed from a number of different standpoints--psychological, social, cultural, political, economic and technological (Norton, 1984).

The theories, methods, and goals of the fields that represent these positions are grounded in the root disciplines and shared body of knowledge associated with each. This study analyzes clothing consumption in two-parent households using the theories and tools of economics, within the integrative framework of the clothing consumption process.

Chapter 2. Review of Literature

This research employs cross-sectional expenditure data to determine the impact of wives' employment on household expenditures for clothing. Relevant expenditure studies will be reviewed as well as related literature that provides theoretical background on how households make decisions with regard to nonmarket production, consumption, and labor supply. Additional related literature on time use will be reviewed because it may provide insight into the underlying reasons that clothing expenditures vary with respect to the employment status and occupation of married women, if this is found to be the case.

The review will begin with literature that is general in scope and move toward that which is specific to clothing.

The first section of the review will be devoted to relevant literature that addresses the question of how *Income from Employed-Wives' Earnings* is spent by the household, i.e., is the wife's income spent differently than other household income?

Household Production and Time Allocation literature will then be reviewed in order to develop the framework within which the nonmarket production and consumption of commodities, and the household's tradeoffs between time and commodities, can be viewed.

Relevant literature pertaining to *Time Use and Strategies for Time Management* will be reviewed in order to examine strategies that may be used by employed wives to decrease time pressures associated with market employment.

In the final section below, relevant *Clothing Consumption* literature will be reviewed. Winakor's clothing consumption process will be described so as to emphasize that acquisition of clothing--in this case, by purchase in the market--is only the initial activity of a set of clothing-related activities in which households engage. Clothing maintenance activities will be emphasized since they, along with acquisition, are usually considered to be the most labor intensive phases of the clothing consumption process. Relevant clothing demand and expenditure literature will be reviewed, following a brief discussion of time-series and cross-sectional data and commonly used explanatory variables in clothing expenditure studies. Time use and time management literature with regard to clothing maintenance activities will be reviewed in order to provide possible explanations for clothing expenditure behavior in employed-wife households.

As is typical of most household demand, expenditure, and time use literature, the studies reviewed here most often employ data on two-parent households with children.

Income from Employed-Wives' Earnings

As more and more married women enter the labor market, household expenditures on many goods and services may be affected directly or indirectly. In households where the husband is employed (as is the case in the studies reviewed below), the presence of the wife in the labor force usually has significant impact on the family's economic status.

Foster and Metzen (1981) used National Longitudinal Survey data to investigate the influence of wife's income on family net worth for the years 1967 and 1972. Their findings indicate that total family income, not its sources, had the most impact on family net worth for these years. Since the working-wife families in the sample had higher total incomes than did the nonworking-wife families, wife's income may have had an indirect impact on family net worth.

Foster and Metzen (1981) also found that, after controlling for income and family composition, working-wife families had lower savings-to-income ratios than did families in which the husband was the sole earner. Foster and Metzen posited several explanations for these lower ratios, among them increased job-related expenditures by the wife, and substitution of market goods and services for the wife's household production time.

Strober (1977) used 1968 Michigan Survey of Consumer Finances data to calculate the ratios of consumption-to-income and of durable goods purchases-to-income of working-wife (W-W) and nonworking-wife (N-W-W) households. Strober found that, when controlling for income and life cycle variables, consumption-to-income ratios were higher for the W-W families, but durables-to-income ratios were the same for both groups.

Strober (1977) states that aside from women with low potential market wage rates and highly educated women with "tastes" for work, most wives enter the labor force in order to raise their family incomes. Strober claims that W-W families *plan* to use wives' earnings to purchase goods and services and to save in the same proportions as do N-W-W families with the same total incomes. However, once the wife is established in the labor force, W-W families consume more (save less) of their total incomes. Strober explains this behavior by stating that W-W families incur employment-related expenses by the wife (such as transportation, clothing, and child care), and that they have less motivation to save than N-W-W families. Decreased motivation to save results from the economic buffer provided by the additional worker; should one earner become disabled or unemployed, the family could rely on the other earner. Also,

if the wife has a pension plan that is partially financed by her employer, the family feels less need to save for retirement.

Strober (1977) suggests that W-W and N-W-W families have the same durable goods purchases-to-income ratios because most families own large durables such as stoves, refrigerators, washers, and dryers whether the wife is employed or not.

Strober and Weinberg (1977) and later Weinberg and Winer (1983) extended Strober's 1977 analysis of durable goods consumption by disaggregating durables into time-saving durables (stoves, refrigerators, washers, and dryers, etc.) and other durables (television sets and furniture). In addition, they included hobby and recreation items, vacations, and college education. In both later studies, wife's labor force participation was not significantly related to the purchase of, nor to the level of expenditure on, these categories of goods. Total family income was, however, a critical variable in both decisions.

The employed-wife families in the above studies devoted more of their incomes to present consumption than did comparable nonemployed-wife families, but this behavior is rational in light of their perceived decreased need to save. Both types of families spent the same proportion of their incomes on durable goods, but this finding may depend on the *types* of durable goods analyzed, and even on the researchers' definitions of durable goods. The equality of the durables-to-income ratios for the two groups is interesting when viewed in another light. For the durable goods studied (as well as expenses on hobbies and recreation, vacations, and college education), wife's income was not used differently than other family earnings sources. This result casts doubt on the belief that women take jobs in order to have "pin money" or to purchase "extras" for themselves and their families.

Household Production and Time Allocation

Household Production Theory

Traditionally, the household has been viewed as a consuming unit that exchanges its human capital for goods and services in the market. The current theory holds that the household also engages in nonmarket consumption and production activities.

In the *Economics of Household Production* (1934), Reid lays a foundation for analyzing the nonmarket economic activities of the household. Reid distinguishes between household consumption and household production--the latter defined as

> Those unpaid activities which are carried on, by and for the members, which activities might be replaced by market goods, or paid services, if circumstances such as income, market conditions and personal inclinations permit...(p. 11).

This is not the case with consumption, an activity that Reid defines as utility producing only when the user of the good is a participant in the activity (p. 10).

Becker (1965) and Michael and Becker (1973) view nonmarket production by households as production activities that combine purchased market goods and services with household time to produce commodities from which the household gains utility (satisfaction). Within this framework, clean clothes, nutrition, child quality, and leisure are examples of commodities that can be both produced and consumed by the household.

A strength of household production theory--the "New Home Economics"--is that it facilitates a more realistic analysis of household economic behavior than does traditional (neoclassical) theory.

Household production theory recognizes that households make interrelated decisions with respect to the allocation of time between the home and the market, the purchase of goods and services from the market, and the production and consumption of commodities within the household.

Time Allocation

In neoclassical theory, consumers are assumed to allocate their time solely between labor (in the market) and leisure. Becker (1965) presents the labor supply issue as an allocation decision between market and nonmarket time. Mincer (1962) and Gronau (1973a) point out that, especially for married women, labor supply decisions are more complex than just deciding how to allocate time between the home and the market. Married women must choose how to distribute their time between leisure, work at home, and work in the market.

The decision of how to allocate time among the three is based on relative prices as well as on tastes and preferences. Changes in an individual's wage rate not only affect the quantity of labor supplied to the market, they also alter the relative prices of time and goods, and, therefore the relative prices and consumption and production of commodities.

In the traditional labor/leisure model of labor supply, the demand for leisure is a function of the wage rate (the opportunity cost of time) and total income. If leisure is a normal good, when income increases, holding the wage rate constant, more leisure is demanded and hours of labor increase. This is the (positive) income effect on the demand for leisure. If income is held constant and the wage rate increases, less leisure is demanded and hours of labor increase. This (negative) substitution effect--the substitution of labor for leisure--occurs as a result of the increased opportunity cost of leisure as wages rise. The actual response of an

individual to a change in the wage rate is the net effect of the income and substitution effects occurring simultaneously; theory cannot predict which effect will be greater.

It is generally agreed (Cain, 1966; Gramm, 1974; Gronau, 1976, 1977; Mincer, 1962) that, for married women, the substitution effect dominates. As the wage rate for women increases, the effect of the added income that could be used to purchase more leisure is overshadowed by the substitution of labor for leisure as the opportunity cost of leisure increases. Less unanimity exists on men's labor force response to a wage increase. Ehrenburg and Smith (1982) state that the income effect has the greater impact on men's hours of market labor, while Gronau (1977) asserts that men respond to an increase in their wage rates by increasing their hours in the market. According to Fleisher and Kniesner (1980), men increase their supply of labor only when wage increases are transitory. In general, however, the income effect is greater for men; as wage rates increase men use the added income to purchase more leisure.

Ehrenberg and Smith (1982) hypothesize that the nature of married women's "tripartite choice" of time allocation--between leisure, work at home, and work in the market--is responsible for their dominant substitution effect. They claim that household work and market work are much closer substitutes than are leisure and market work. Since men allocate relatively little time to household production and cannot hire someone to consume leisure for them (recall Reid's, 1934, definition of consumption: it is an activity which requires the participation of the user), they tend to shift toward increased leisure as their wage rates increase. Women engage in more household production than men do and it is easier to find substitutes for their home production time, by hiring services or by using time-saving machines. Therefore, women more easily alter their time allocation to market work as the relative opportunity cost of non-market time changes.

Redman (1980) disagrees with Ehrenberg and Smith's (1982) analysis. In her study of women's time allocation and expenditures on convenience foods and market produced meals, she concludes that employed mothers substitute between market work and *leisure*.

Although employed women may find that ease of substitution between nonmarket and market work allows them to respond to increases in wage rates, there is ample evidence that *both* home production time and leisure time decrease when market labor increases.

Gronau (1977), using 1972 Michigan Study of Income Dynamics data on married women, determined that husbands' wage rates and nonlabor income had the major impact on the time allocation of nonemployed women. As husbands' wage rates and nonlabor income increased, nonemployed women decreased their amount of work in the home and increased their leisure time. The time allocation of the employed married women was most affected by their own wage rates, and both work at home and leisure declined as wage rates rose; their leisure time fell at almost 4 1/2 times the rate of their nonmarket work (Calculated from Table 3, p. 1115).

Stafford (1983), employing 1967-68 Syracuse time-use data, also found that as wives' employment time increased, both their household production time and leisure decreased. Employed wives (at all stages of the life cycle) gave up much more leisure than household production time, in this study an average of three times as much (Calculated from Table 3, p. 265).

Time Use and Strategies for Time Management

Fleisher and Kniesner (1980), as well as Becker (1965) and Mincer (1962), assert that within the household production framework there are actually two substitution effects when wage rates increase. First, there is substitution in consumption, i.e., a substitution away from con-

suming time-intensive commodities. Secondly, there is substitution in production characterized by substitution away from time-intensive, toward goods-intensive production of commodities in the household. According to Ehrenberg and Smith (1982), men and women substitute away from time-intensive consumption (toward more goods-intensive consumption) as their wage rates increase, and women tend to adopt less time-intensive methods in household production as well. Sharir (1975) refers to this shift toward goods-intensity as an attempt by individuals to buy back some of the leisure time that has been sold to the market.

Strober and Weinberg (1977) describe five strategies that employed wives might use to reduce time pressures, and Nichols and Fox (1983) categorize these strategies as either "time buying" or "time saving". Whereas Nichols and Fox categorize the use of purchased market goods and services to substitute for wives' time as a time buying strategy, they classify increased efficiency in household production, reduction in the quantity and quality of household production, and shifting work to other household members as strategies designed to save or manage time more effectively. Nichols and Fox consider the strategy of reductions in time allocated to leisure or to volunteer or community work as either time saving or as failures of the other strategies above.

A strategy not pursued by either Strober and Weinberg (1977) or Nichols and Fox (1983) is that of employed wives taking advantage of the fact that hours at different times of the day and on different week days do not have the same opportunity cost. Although some wage earners value their hours outside of market work at the same rate as their wage-earning time, it is more common to view these hours as costing less since earnings are not forgone by their use.

Substitution of Market Goods and Services for Employed Wives' Time

Market goods and services can substitute for women's labor (time) input into household production activities. Inputs into production are used such that the ratio of their marginal products (the marginal rate of technical substitution) equals the price ratio. As a result, at equilibrium, the marginal product of the last dollar spent on the wife's labor (for example) equals the marginal product of the last dollar spent on substitute goods or services. In the case of employed wives, if the price of their labor is their wage rate, as wives' wage rates increase, all else equal, it is rational for households to use more of the now relatively less costly market goods and services.

On the consumption side, utility is maximized when the ratios of marginal utilities to prices are equated. When time is "produced" via the use of substitute market goods and services, time becomes a commodity in the Beckerian sense. This time, as a commodity, will be consumed until the utility of the last dollar spent to produce it (the wife's wage rate) equals the utility from the last dollar spent on all other produced commodities.

Since the price of time as an input has a fundamental impact on both production and consumption in the household, the opportunity cost of married women's time can determine what and how commodities are produced and consumed in the household.

As discussed in more detail at the beginning of this review, the results of Strober (1977), Strober and Weinberg (1977), and Weinberg and Winer (1983) indicate that wives' labor force participation is not significantly related to the purchase of, nor to the level of expenditure on, durable goods (capital goods that could be considered substitutes for the wife's labor). It was also discussed that these results may depend on the researchers' definitions of durable goods.

Nichols and Fox (1983) used time-use data on two-parent, two-child families to replicate and expand upon Strober and Weinberg's (1977) work. Nichols and Fox analyzed the impact of the wife's employment status on certain convenience products and meals, as well as on durables. Their results for durables confirmed those of Strober and Weinberg. They found that employed wives used only one of the convenience products--disposable diapers-- significantly more than nonemployed wives did. Again, the researchers' definition of convenience products may limit the generalizability of this result.

Bryant (1986) used 1977-78 Survey of Consumer Credit data to analyze expenditures for total durables and found that as wives' time in the labor force increased, household expenditures for durables decreased. Bryant's results indicate that durables and wives' time are complements; that employed women have less time to devote to the use of durables in the home, therefore, expenditures on durables decrease as women's commitment to the paid labor force increases.

Nichols and Fox (1983) found that employment status of wives was a significant factor in the purchase of meals at fast food outlets. Previously, Redman (1980) found that employed wives utilized more prepared foods in the home, but did not purchase more meals away from home than did nonemployed wives.

Nichols and Fox (1983) found that the use of market-purchased services, such as housecleaning and laundry, was positively affected by family income but not by employment status of the wife. Purchased child care was the only service they examined that was significant with respect to the wife's employment status.

Bellante and Foster (1984) used 1972-73 Consumer Expenditure Survey data to examine the impact of wives' labor force participation on household expenditures for five categories of services: food away from home, child care, domestic services, clothing care, and personal care. They found that the number of weeks the wife worked per year had a significant positive

effect on food away from home and child care, ceteris paribus. Households with wives who worked full-time spent significantly more on these same two categories of services than did households with wives who were homemakers. In addition, there was no significant difference in expenditures on food away from home and child care between full-time and part-time employed wives, all else equal. Bellante and Foster (1984) found that the households with wives employed part-time exhibited higher expenditures for clothing care than did the households with wives employed full-time.

Increased Efficiency in Household Production

In 1912, in *The Backward Art of Spending Money*, Mitchell railed against the inefficiencies in production and consumption of individual households, but he conceded that "it is the character of the work more than the character of the women who do the work which is responsible for poor results" (p. 271). Mitchell pointed out that the small scale (relative to a business enterprise) of most household production and consumption activities--such as purchasing, cleaning, laundry, and child care--prohibits specialization and division of labor. He referred to the difficulty in trying to increase efficiency through the use of specialized machinery by observing that the homemaker's tasks are so varied and scattered that families must be cared for primarily by hand. Mitchell also acknowledged that the "general managers" of households, unlike those of businesses, are not selected on the basis of their efficiency.

Reid (1934) claims that this small scale, unspecialized nature of household production leads to two kinds of waste: waste as a result of incorrect methods and unskilled performance, and waste as a result of idle equipment.

Reid's (1934) assessment of the nature of homemaking as an occupation is similar in some respects to Mitchell's (1912). Reid contends that the homemaker's insulation from competition

(whereby she does not have to find another job if her performance is substandard) removes the incentive to increase efficiency. Reid also points out that many women become household workers because they marry, not because it is where their true talents lie.

However, Reid (1934) notes that household production may actually eliminate waste since goods are produced at the place of consumption by the group that will consume them. The ramifications of this situation are several and varied: there are no transportation, storage and distribution costs; no costs of advertising and selling; no overproduction and no deception as to quality. Perhaps Reid's strongest argument for household production over market purchase is that some activities must be carried out by a member of the household in order to be enjoyed by the household. In addition, (typically) wives and mothers cater to the preferences of their families in ways that mass producers or commercial services cannot. Individual likes and dislikes may be taken into account when productive activities are carried out in the home. Reid concludes that the efficiency of the *act* of production (technical efficiency) is not the issue; economic efficiency is achieved if households produce what they desire to consume--if production and consumption are "perfectly adjusted"--with the result that waste is eliminated. Since this adjustment between production and consumption is specific to each individual household, economic efficiency in household production is, predictably, difficult to measure.

Technical efficiency in household production is also notoriously difficult to measure. Nichols and Fox (1983) attempted to measure wives' technical efficiency by determining the number of items that were prepared per meal. Michael (1975, p. 241) defines efficient production as producing a given quantity of output with smaller amounts of input. Apparently this is what Nichols and Fox were trying to measure, but they admit that their measure may reflect meals of lesser quality rather than increased efficiency in preparation.

Reduced Quantity and Quality of Household Production

Strober and Weinberg's (1977) strategy of reducing the quality of household production may be as difficult to quantify as is the strategy of increasing efficiency. Perhaps a testimony to the difficulty is that the literature searched for this review yielded no evidence of investigation of the quality of household production.

It is generally accepted in the household production literature that the wife's education is an indicator of nonmarket production efficiency. Education has long been recognized as the prime source of changes in production in the market sector (Gronau, 1973b). Michael (1973) argues that since education is a form of human capital, and human capital is embedded in the individual, it therefore accompanies the individual wherever he or she goes. Although Gronau agrees that education may affect nonmarket and market production in the same manner, he makes the point that it would be difficult to separate the effect of education from that of "natural ability".

Some of the literature that examines time use of homemakers and employed women (Hafstrom & Schram, 1983; Walker, 1973) equates decreased hours of household production by employed women with increased efficiency. Peskin (1982) points out that there are no data available that could lead to the conclusion that employed women are more efficient than nonemployed women--the data only indicate lower levels of home-produced goods and services in households with employed women.

Gramm (1974) makes the point that, although households consume more of normal commodities (such as meals, clean houses, and clean clothes) as their incomes increase, the time that married women spend on these activites may in fact decline, since for most women, cooking, cleaning, and doing laundry are not essential for utility maximization.

How much less time is spent in household production by employed wives varies across studies, but in general women reduce their hours of nonmarket production time when they become employed. Peskin (1982, p. 21) estimates that nonemployed women in 1975-76 spent almost 43 hours a week in household work, compared to slightly over 20 hours by women employed full time. Walker's (1973, p. 8) data show that nonemployed women spend 35-84 hours a week on household production activities, while employed women spend 28-56.

Both Nichols and Metzen (1978) and Hafstrom and Schram (1983) found that employed wives' levels of education were not significant in explaining time spent in nonmarket labor.

Since occupational status and education are usually positively correlated, some researchers have investigated the effect of women's occupations on time spent in household production activities. Berk and Berk (1978) and Nichols and Fox (1983) found that when women in high status occupations entered the labor market, they reduced their household work time significantly more than those in low status occupations did. Hafstrom and Schram (1983) found no significant impact of employed wives' occupations on time spent in nonmarket work.

Substitution of Other Family Members' Time for Employed Wives' Time

Just as market goods and services can be substitutes for employed wives' household production time, so can the time of husbands and children. In reality, however, they rarely are. Berk and Berk (1978), Nichols and Fox (1983), Sanik (1981), and Walker (1973) found that wives' employment did not have a significant effect on husbands' household production time. Sanik compared the division of household work over the decade 1967-77. In addition to finding no significant differences in the amount of nonmarket work contributed by husbands over this time, of the daily amount husbands did contribute (approximately 1.7 hours per day), over 40%

was devoted to productive activities outside of the house, e.g., yard care and care and repair of automobiles (p. 178).

Nichols and Fox (1983), Sanik (1981), and Walker and Woods (1967) found that wives' employment had no significant effect on hours of household production time of children either. Interestingly, Sanik and O'Neill (1982) found that children actually contributed *less* time to household production as parents' hours of employment increased. Sanik and O'Neill conjecture that children may allocate more time to household work when parents are at home to supervise them.

Walker and Woods' (1967) analysis of time-use data on upstate New York families indicates that husbands increased their average daily contribution to some activities in response to their wives' employment. However, the husbands' time allocations to these tasks were so small to begin with that the actual effect of the increase was not dramatic. For example, on average, husbands engaged in 12 minutes a day of meal preparation when their wives were employed, compared to six minutes a day when they were not (p. 257).

Walker's (1973) study shows that household work time of husbands is related to the number of hours they themselves spend in the labor market, and is not affected by the employment of their wives nor by the ages and numbers of their children.

Berk and Berk (1978)--using a small sample of affluent suburbanites-- found that wives employed in high status occupations engaged in a smaller proportion of their household's production activities than did wives with lower status occupations. The husbands with high status occupations performed a significantly higher proportion of household production tasks than did those in low status occupations. However, Berk and Berk point out that the wives still bore the burden of most of the household work. For a family in which, on average, the husband did 21% of the household work and the children did 16%, wives employed in professional

occupations were still responsible for 62% of the productive activities of the household. When the wife was a waitress, on average her contribution was 75% (p. 463).

Utilization of Least-Cost Hours for Household Production Activities

Time used outside of regular market work hours, usually in the evenings and on the weekends, is generally less costly to the user since he or she is not forgoing wages by its use.

Although time use data is often collected on Saturdays and Sundays as well as on weekdays, and for evening hours as well as during the rest of the day, the reported results are rarely broken down in such a manner as to differentiate between types and times of days. For example, Walker and Woods' (1976) classic time-use study used data that were obtained on all days of the week for each hour of the day, but the results were presented in total and average hours "per day".

The few examples found where the distinction can be made between types and times of days offer differing kinds of information. Vanek (1974) found that nonemployed women spent more time in housework than did employed women, both on weekends and on weekdays. Vanek states that employed women use the weekends to "catch up" on their nonmarket work, even though they devote a half hour less per weekend day to these activities than do the nonemployed women. The employed women in Vanek's study spent a little less than four hours per weekday and almost five hours per weekend day on household work (p. 120).

Robinson's data (1966, Table 7) indicate that in two-earner families with children, husbands had 1.4 hours more free time than their wives had on Sundays--compared to 1.3 hours more on weekdays. Although this finding suggests that employed wives with children spend somewhat more time in household production activities on Sundays than on weekdays, data for Saturdays might have produced more dramatic results, had they been provided.

Robinson does present data (1966, Tables 10 & 11) on time spent in housework activities (preparing food, cleaning house, laundry and mending, and other household upkeep) by employed men and women for Saturdays and Sundays as well as for weekdays, but without controlling for household type and composition. These data show that employed women devote 1.9 hours more to housework activities on weekdays and Sundays than do employed men. On Saturdays employed women spend three hours more on such activities than do employed men.

Becker (1965) points out that--just as the cost of time is not the same in all time periods--the cost of time is not the same for all commodities. The opportunity cost of time is less for commodities that indirectly contribute to income from earnings. Becker uses sleep, food, and play as examples of such commodities, and refers to them as examples of "productive consumption" (p. 99).

Goldberg (1977) makes a distinction between production housework and maintenance housework. Although within the household production framework Goldberg's examples of maintenance housework (e.g., washing clothes and cleaning) would be viewed as production activities, the distinction may be useful when theorizing about how different types of nonmarket hours are used.

It seems reasonable that employed wives with children will choose to devote their nonleisure after-market-work hours to those activities that cannot be postponed until a more convenient time. Production activities such as meal preparation and clean up, child care, and personal care exemplify activities that generally need attention before another day's cycle begins. Productive maintenance activities such as house cleaning, laundry, ironing, yard care, and shopping may not need to be done every day and therefore can be "saved-up" for a more convenient time or until a sufficient quantity is ready to be "processed".

Robinson's (1966) data do support such a scenario with regard to house cleaning and laundry. The employed women in Robinson's sample devoted an average of 24 minutes more to housecleaning and 13 minutes more to laundry (and mending) on the average weekend day than on the average weekday (calculated from Table 11).

Only one of the studies reviewed here distinguished between evening hours and other hours of the day. In Berk and Berk's (1979, p. 158) detailed study of household time-use activity patterns, the researchers found only one significant difference in the evening activity patterns of employed and nonemployed wives; the employed wives spent time preparing laundry after dinner while the nonemployed wives did not.

There is ample evidence that employed wives with children operate under strict time constraints and adjust their hours of household production and leisure accordingly. In this light, it may be rational to further subdivide household production commodities into production and maintenance commodities in order to better align the theory with what may be occurring in practice.

In summary, of the strategies suggested by Strober and Weinberg (1977) that might be used by employed wives to reduce time pressures, only the strategies of reducing the quantity of household production and of reducing leisure appear to be used. It may be the case, however, that employed wives have an acute sense of the variable cost of their nonmarket hours. They may shift production activities within that restricted time frame to allocate most nonleisure weekday evening hours to relatively low cost production activities, such as meal preparation and child care. These activities are low cost relative to some maintenance activities such as housecleaning and laundry since the latter may not require daily attention.

Within this framework, it may be the case that employed wives do not necessarily utilize purchased market goods and services as substitutes for their time, as much as they use them to assure that some maintenance activities do not need to be done on a daily basis. Increasing

the stocks of certain goods and services, e.g., groceries or clothing, could mean that some activities can be accomplished at convenient times. It may also mean that these activities can be done when there is sufficient built-up need, i.e., a weekly grocery list or full loads of laundry of the same type. In this sense employed wives may utilize the strategy of increasing efficiency in household production.

Clothing Consumption

The Clothing Consumption Process

In *The Process of Clothing Consumption* (1969, p. 629), Winakor enumerates the ways ("senses") in which the expression "clothing consumption" is used:

1. As a synonym for money expenditures for clothing purchased in the market, sometimes including also expenditures for clothing materials and services
2. To mean the use or final "using up" of clothing and related services
3. To encompass the whole process of acquiring, storing, using, maintaining, and discarding clothing.

Winakor's model of clothing consumption is based on the third, more comprehensive, sense of the expression.

The data employed in this research are in the form of money expenditures for clothing purchased in the market (No. 1 above). However, Winakor's (1969) comprehensive conceptualization of clothing consumption has been embraced here since suppositions will be put forth as to how clothing inventories are used and maintained by households with employed women.

Inherent in Winakor's model of clothing consumption is the concept of clothing as a durable or semidurable good; the model encompasses both stocks (use, care, and storage of inven-

tories) as well as flows (acquisition and discard) that occur over time. Although there are some one-use clothing items available from the market (e.g., nonwoven disposables such as diapers and hospital gowns), most commonly acquired items of clothing are intended for use over time and degree of durability and ease of processing are often decision variables for the purchaser.

Burk's (1968) conceptual models for nondurables and durables differ primarily in the time frame of scheduling flows: nondurable goods are subject to nonrecursive production scheduling and processing, whereas the establishment of the frequency and intensity of an operating schedule for durable (and semidurable) goods implies use and maintenance over time.

As has been alluded to several times earlier in this review, the results of the previously cited research on employed-wife households' expenditures for durables (Strober, 1977; Strober & Weinberg, 1977; Weinberg & Winer, 1983) depend on the researchers' definitions of durable goods. Contrary to Winakor's conceptualization and to clothing consumption behavior commonly in evidence, most analysts and researchers outside of the clothing field consider clothing to be a nondurable good.

Although, on the one hand, clothing was overlooked in these important studies examining durable goods expenditures by employed-wife households, clothing often has been among the commodities included in large expenditure studies in this and other countries, e.g., Crockett & Friend (1960); Houthakker & Taylor (1970); Prais & Houthakker (1971); Stone (1954); and Stone & Rowe (1957). These scenarios--both the omission of clothing from the above cited durable goods studies and the inclusion of clothing in large multicommodity studies--are analogous in that both fail to recognize the unique and complex nature of clothing and clothing consumption as defined by Winakor.

Demand and Expenditures for Clothing

In neoclassical theory, consumer demand for clothing is a function of the price of clothing, the prices of other goods, income, and a set of variables that represent the consumer's tastes and preferences. Consumer expenditure for clothing is simply the demand function multiplied by the price of clothing.

In cross-sectional data sets, like the one employed here, it can be assumed that all consumers face the same prices. Therefore, consumer expenditure can be expressed solely as a function of income and a set of sociodemographic variables that represent tastes and preferences.

Since this study uses cross-sectional expenditure data, this review will focus on clothing demand and expenditure studies that have used cross-sectional data. However, a brief mention of the use of time-series data is in order.

Time-Series Demand and Expenditures for Clothing

Researchers often employ time-series data to determine the effect of changes in income and prices over time on demand or expenditures for clothing. It is usually not feasible to collect longitudinal (time-series) data on selected individuals or families due to time and cost considerations, attrition from the sample as a result of migration, change in the family composition or the marital status of the head, and an unwillingness of people to keep detailed records over extended time periods. Consequently, time-series data often are obtained from government agencies that have aggregate (summed over the population) data available, usually annual. The inherent weakness of aggregate data is that the results only say something about "average" individuals or families; tastes and preferences are averaged out by the aggregation.

Houthakker and Taylor (1970, p. 69), using U. S. data from 1929 to 1964, excluding the war years 1942-45, found that real income (and previous year's clothing expenditures) explained over 95% of the variation in expenditures for clothing. When relative price was included in the model, it did not contribute significantly to the explanatory power.

Hamburg (1958, p. 370), using U. S. data for the period 1929 to 1955, excluding the war years 1942-45 and 1946, also found that income was the significant explanatory variable for clothing expenditures and that the relative price of clothing was not significant.

DeWeese (1985, p. 4) used aggregate U. S. data from 1935 to 1970, including the war years 1939-45, and found that over 99% of the variation in clothing expenditures was explained by changes in disposable income and population size, as well as by dummy variables for the war years.

Results from longitudinal demand and expenditure studies are useful as policy tools on a macro level. However, in the short run, behavior commonly in evidence indicates that clothing consumption is affected by more than income alone. The use of disaggregate cross-sectional data that include sociodemographic variables as proxies for tastes and preferences often provides insight into the micro factors affecting clothing consumption.

Cross-Sectional Demand and Expenditures for Clothing

The inclusion of sociodemographic variables in cross-sectional analyses allows the researcher to control for certain attributes that are thought to represent tastes and preferences, e.g., size and composition of family, occupation, race, type of housing tenancy, etc. The use of sociodemographic variables allows the researcher to tailor the analysis in such a way that

very specific information can be obtained from the sample. The difficulty arising from such specificity is in trying to compare between studies.

Most cross-sectional analyses of demand or expenditures for clothing include some of the same categories of explanatory variables, e.g., income variables; family size and composition variables; variables representing the age, sex, race, education, and occupation of the household head, etc. Even comparison between these common groups of variables is made difficult by the fact that they are rarely manifested in the same manner. For example, income can be represented by before tax, after tax, real, disposable, family, individual, exclusive or inclusive of government transfer payments, exclusive or inclusive of gifts or tips, etc.

The following discussion of the literature is organized around general categories of explanatory variables commonly employed in cross-sectional studies of demand and expenditures for clothing.

INCOME. The inclusion of income variables in regression equations allows researchers to obtain income coefficients which directly (via the use of logged income data) or indirectly (via calculation) provide income elasticities. Income elasticities for clothing indicate the responsiveness of changes in expenditures for clothing (at an increasing, decreasing, or equal rate) to a one percent change in income.

Clothing usually is considered to be a normal good; as income increases (decreases), people increase (decrease) expenditures for clothing in general, but at less than the rate of income change (i.e., clothing usually has an income elasticity between 0 and 1). Income elasticities obtained from the two BLS expenditure survey data sets previous to the 1980-81 data that are used here indicate that clothing is a normal good. Lee and Phillips (1971, Table 2) obtained income elasticities of .985 for urban households, .991 for rural nonfarm households, and .629 for farm households in the 1960-61 BLS data. Thus, a 100% increase in income for the urban

(rural nonfarm, farm) families would have resulted in approximately a 99 (99, 63) % change in the same direction in expenditures for clothing, all else constant. The clothing category used by Lee and Phillips contained clothing material and services as well as clothing. Horton and Hafstrom (1985, Table 1) found that two-parent households in the 1972-73 BLS data set had an income elasticity for clothing (and cleaning) of .703.

The above studies all used disposable, after tax income as the income variable, but the samples differed as did the models with respect to the ceteris paribus (control) variables.

Dardis, Derrick and Lehfeld (1981) used 1972-73 BLS data in their analysis of U. S. clothing demand. For 1973, they obtained an income elasticity of 1.19 when total expenditures were used as a proxy for permanent income, and .619 when disposable income was used (Table 3, p. 218).

Although income elasticities for clothing from cross-sectional data may vary across studies, it does appear that clothing expenditures do increase (decrease) when income increases (decreases), but the change is less than unitary (percent for percent).

Hager and Bryant (1977) used 1970-72 data on participants in the Rural Income Maintenance Experiment (RIME) to determine the marginal propensities to consume (MPC) new clothing out of wife's income, other family income, and government transfer payments in the form of a negative income tax (NIT). They found that the MPC for clothing was higher out of wife's income than out of other family income or out of the NIT payments. For a $100 increase in the wife's winter quarter income, there was a four to five dollar increase in expenditures on new clothing. This is in contrast to a 70 cent increase in expenditures for clothing out of other family income in response to a similar increase in other family income for the same quarter (p. 130).

NUMBERS, AGES, AND SEXES OF FAMILY MEMBERS. Intuitively, it seems reasonable to hypothesize that expenditures for household clothing would increase with increasing family size. The studies by Lee and Phillips (1971) and by Horton and Hafstrom (1985) using 1960-61 and 1972-73 BLS data respectively, bear this out. It is interesting to note that in Erickson's (1968) analysis of the 1960-61 BLS data, she found that single consumers had the highest adult clothing expenditures of the family types studied. It would appear that the presence of children increases household expenditures for clothing, but to some extent this increase is at the expense of the clothing expenditures of the parents.

Erickson (1968) found that individual family members' expenditures for clothing increased from infancy to the late teens and early twenties before they began to decline. The women and girls in Erickson's sample spent more on clothing at every age than did the men and boys. Families spent 10% more on clothing for preschool girls than for boys and the expenditure difference between the sexes grew to 42% for children aged 16 to 17. The difference in clothing expenditures between the sexes began to decrease after age 18 and fell to 25% after age 25 (p. 14). The results from Hager and Bryant's (1977) analysis of RIME families supports Erickson's finding on sex-based differentials in expenditures for clothing.

EDUCATION. Hafstrom and Dunsing (1972) analyzed 1960-61 BLS expenditure data and found that, ceteris paribus, husband's education was not significant in explaining families' expenditures for clothing. The authors noted that the omission of the wife's education from the model might have been a serious oversight, since the wife's education may have been a more important determinant of some family expenditures than was that of the husband.

Dardis et al. (1981) used 1972-73 BLS data in their analysis of U. S. clothing demand. They used education of the household head as the education variable and found that education had a significant positive impact on family expenditures for clothing.

Hager and Bryant (1977) used wife's education as the education variable and found that expenditures for clothing increased with increasing education of the wife.

EMPLOYMENT STATUS. Dardis et al. (1981) analyzed the impact of wife's employment status on family expenditures for clothing. They found that households with employed wives spent more on clothing than did households with wives who were not employed. The higher expenditures in the employed-wife households were hypothesized to result from increased clothing expenditures for the wife, especially for white-collar wives. They also found that households with a nonworking head spent less on clothing than did other household types in the study.

Frisbee (1985, p. 205) analyzed Canadian expenditure data from 1978 and found that employed-wife households spent between $117 and $138 more per year on clothing than did the nonemployed-wife households in the sample. In addition, the employed-wife households had higher expenditure elasticities for clothing than did the households in which the husband was the sole earner. This means that as total consumption increased, the dual-earner households allotted a larger percentage of the additional consumption to clothing than did the households with nonemployed wives.

Vickery (1979, Table 25, p. 183) used 1972-73 BLS expenditure data to analyze the impact of wives' employment on expenditures for their own clothing. Vickery found that wives who worked full time spent $103 more per year on their clothing than did the full-time homemakers in the sample. Drake, Ruffin, and Kocher (1983, p. 4A) found that employed wives in the 1972-73 BLS data spent over $40 a year more on their clothing than did the nonemployed homemakers in the sample. Drake et al. (p. 4) stated that "some other researchers have found no differences in clothing expenditures of working and non-working wife families, after income is controlled." This statement is not referenced.

Hafstrom and Dunsing (1965) studied 50 families in Illinois and found that although the two-earner families in the sample had higher average expenditures for total family, husband's, and children's clothing, expenditures for employed wives' clothing were equal to those of the nonemployed wives in the one-earner families. The small sample size and restrictive sample selection criteria (the husbands had to be nonacademic employees of the University of Illinois) make these results difficult to generalize.

OCCUPATION. Of the cross-sectional analyses reviewed above, only three included occupation as an explanatory variable of expenditures for clothing. Hafstrom and Dunsing investigated the effect of the father's occupation on various family consumption categories, but did not present the results in such a way that the effect on clothing expenditures could be determined.

Dardis et al. (1981) used occupation of the household head in their model and found that the clothing expenditures of households headed by white collar workers exceeded those of households headed by blue collar workers.

Drake et al. (1983, p. 4A) found that wives employed in professional occupations spent almost $85 a year more on their clothing than did the nonemployed homemakers in the sample. Wives employed as professionals in business spent over $74 a year more on their clothing than did the blue collar wives in the study; wives categorized as other professionals spent almost $83 a year more than did the blue collar wives. Wives employed in clerical and sales occupations spent approximately $61 and $46 more, respectively, than did the blue collar wives. Annual expenditures for clothing by the homemakers in the sample were not significantly different from the clothing expenditures of the blue collar wives (p. 6A).

Drake et al. (1983) also investigated the effect of the husband's occupation on the wife's expenditures for clothing. When the wife was employed, her occupation was more determinative than her husband's with regard to expenditures for clothing for herself.

Traditionally, variables used as proxies for the husband's tastes and preferences (his occupation, education, etc.) have been used to explain household consumption behavior. As more wives enter the paid labor force, the impact of their incomes and occupations will need to be taken into account in analyses of household consumption.

Of the demand and expenditure studies reviewed above, only one investigated the effect of wife's occupation on expenditures for clothing, and only the effect of the wife's occupation on her own clothing expenditures was assessed. The impact of the wife's occupation on household expenditures for clothing has not been analyzed.

Empirical Analysis in Clothing Expenditure Studies

Most clothing expenditure studies that employ multiple regression use least squares techniques. Least squares is an appropriate econometric technique when non-zero values for the dependent variable are observed over the entire sample, e.g., when all households in the sample purchase the commodity in question during the time period under study.

Such a scenario is not often the case with expenditure data. It is more often the case that the sample is "censored". Censored samples are those in which there are data on the explanatory variables for all observations in the sample, but as a result of nonpurchase by some households, data on the dependent variable are equal to zero for a portion of the sample.

Expenditure data are usually truncated as well. Truncation refers to the situation where data are cut off (truncated) at some number (usually zero), but are continuous above--as is the case with expenditure data-- or below that number.

Tobit is a technique appropriate for analyzing censored response models that yield truncated data on the dependent variable (Capps, 1983; Kinsey, 1984; Maddala, 1983; Tobin, 1958). Use of least squares analysis on these types of data will result in inconsistent estimates. All of the clothing expenditure studies mentioned in the section above (except Erickson, 1968, who used tabulated data) used a form of least squares in the analysis of the data. Tobit analysis has not been employed previously to estimate clothing expenditures.

Time Use and Time Management in Clothing Consumption

Typically, acquisition and maintenance are the most labor intensive phases of the clothing consumption process. Since acquisition is an activity that is common to both durable and nondurable goods, it will not be addressed in the following discussion. Rather, maintenance, which is an activity unique to durable and semidurable goods, will be the focus since it is the durable nature of clothing that is the underlying premise of Winakor's (1969) model of clothing consumption.

Time-use data on clothing maintenance varies widely in scope. Often data consist solely of time spent in "clothing care" or "laundry" and frequently researchers fail to operationally define these aggregate activities. Walker and Woods (1976, p. 56), however, disaggregate clothing care into washing by machine, ironing, and special clothing care:

> The time reported for washing by machine included time spent primarily on the preparation and cleanup operations since the various washing operations are most often automatic. If the machines used were nonautomatic, time used for rinsing and wringing clothes was included. The preparation activities included collecting and sorting soiled articles for washing, pretreating them, and loading the washer. The after-washing activities included unloading the washer, loading and unloading the dryer or hanging up articles to dry and taking them down, and folding and storing unironed articles.

The time when the washers and dryers were in operation was not included in the time reported. When the machine is operating, the full attention of the worker is not required and the worker can spend the inactive work time on other activities.

The time spent on ironing included the time when direct attention was given to preparing clothing and household textiles for ironing, ironing or pressing the articles, getting out and putting away equipment, and folding and returning articles to storage.

Special care and construction of clothing and household linens included any work on clothing and household textiles not specifically part of household washing or ironing. Washing by hand was classified as special care of clothing and linens since this is a special requirement of items made of certain materials. The other types of work included in this category were drycleaning, seasonal storage of clothing, mending, spot removal, shoe care, and construction, repair, or adjustment of clothing and household textiles.

Such detailed operationalization serves to make the point that clothing maintenance is a complex set of activities that requires temporal and spacial planning and management.

Robinson's (1966) data (calculated from Table 11) show that 17% of the average daily housework done by employed women was devoted to laundry and mending. Nonemployed women spent 19% of their average daily housework time on these activities. These data indicate that laundry (and mending) activities constitute the third largest component of total average daily housework. Cleaning house demands the largest portion of housework time (42% by employed women, 40% by nonemployed women), followed by preparing food (31% of average daily housework by both employed and nonemployed women).

Walker and Woods (1976, Table 7.5, p. 205) found that nonemployed wives spent an average of 1.3 hours per day on all clothing care, compared to an average of one hour a day by the employed wives in their study. When all clothing care was disaggregated, the nonemployed wives were found to spend more average daily time than did the employed wives on washing by machine (36 minutes compared to 24 minutes), and on ironing (24 minutes compared to 18 minutes). Both groups of women spent an average of 18 minutes a day on special clothing care.

In light of the importance of clothing maintenance time in total household work time, and of the additional time constraints faced by employed wives, it is useful to re-examine Strober and

Weinberg's (1977) strategies for time management, specifically with regard to clothing maintenance.

Strategies for Time Management in Clothing Maintenance

SUBSTITUTION OF MARKET GOODS AND SERVICES FOR EMPLOYED WIVES' TIME. Leibowitz (1974, p. 246) used Walker and Woods' (1976) 1967-68 New York data and found that capital goods could be used as partial substitutes for women's time inputs into washing clothes. These data indicate that women using automatic washers spent an average of almost 20 minutes a day less on washing than did women using nonautomatic washers.

Quantitative research aside, most individuals who have the responsibility for doing laundry realize the time- and effort-saving character of washers and dryers. In 1967, 88.2% of electrically wired American households owned washers and 30.5% owned dryers ("Ten-Year Summary," 1968, p. 43). By 1979, the year before the BLS data that were used for this research were collected, the percentage of households with dryers had doubled ("Saturation Levels," 1980, p.61).

As Walker and Woods' (1976) definition of washing by machine makes clear, the use of an automatic washer frees the machine operator to engage in other activities while the clothes actually are being washed. The same preparation and after-washing activities that are involved with the use of a nonautomatic washer must be carried out, however. Individuals using dryers are freed from using time to hang out and take in clothes from a line and also are able to dry (and wash) clothes at their convenience instead of scheduling around the time of day and/or the weather.

Walker and Woods (1976, Table 7.7, p. 208) found that very few households take advantage of market produced clothing care services. Only 3% of the households in their sample used a

commercial laundry on the record days, and only 1% hired someone to come into the household to do washing. Use of a commercial laundry may require the household to deliver and pick up the laundry, and it certainly means that the household becomes subject to the laundry's production scheduling once the clothes leave the household.

It appears that households are more likely to purchase goods to partially substitute for wives' time than they are to hire services. The explanation for this may be that by using machines in their homes, wives are able to schedule the production of clean clothes around their (as well as the household's) needs. In addition, by producing clean clothes in the home with household labor, the household does not incur the time and monetary costs associated with supervising and paying for a hired worker, transportation, and/or loss of access for last minute laundering, etc.

INCREASED EFFICIENCY IN HOUSEHOLD PRODUCTION. As in the general case, efficiency in the production of clean clothes is a difficult concept to quantify. The consolidation of loads of laundry and sorting by color, weight, and fiber content are usually recommended by home management experts as ways of increasing technical efficiency in producing clean clothes. However, in the case of economic efficiency, it is more important that the household produces what it wants at the lowest possible cost. This then may be the explanation for the behavior that Walker and Woods (1976) found with regard to lack of purchase of commercial services. It may be more efficient for households to purchase "labor saving" machines to be used by household members for processing laundry in the home than it is to purchase services from the market. By producing clean clothes in the home with the labor of a family member, the household is better able to dictate how and when laundry will be done as well as eliminating transactions costs.

REDUCED QUANTITY AND QUALITY OF HOUSEHOLD PRODUCTION. As was stated earlier, none of the sources reviewed here attempted to measure the quality of household production, including that of clothing maintenance activities.

Both Vanek (1974) and Walker (1973) claim that households possess more clothes, wash the clothes they have more often, and as a result, spend more time doing laundry now than at any time in the past.

Walker and Woods (1976) found that employed wives spent less time per day than nonemployed wives on washing by machine and ironing. They also found that employed wives washed slightly fewer loads on the record days than did the nonemployed wives (1.3 compared to 1.5) and that they ironed fewer items of clothing as well (4.1 compared to 5.9) (Table 7.13, p. 216).

The fact that the employed wives in Walker and Woods' (1976) sample did slightly less washing and ironing could conform to several possible scenarios. Employed women may be more inclined to wait for a full load to wash, thus washing fewer loads, or they may prefer to purchase clothes made from "easy-care" fabrics that require less ironing. Or, it may be that, as Vanek (1974, pp. 89-90) suggests:

> Since the value of household work is not clear, nonemployed women feel pressure to spend long hours at it. Time spent in work, rather than the results of the work, serves to express to homemakers and others that an equal contribution is being made. Women who work in the labor force contribute income to the family and so do not feel the same pressure.

SUBSTITUTION OF OTHER FAMILY MEMBERS' TIME FOR EMPLOYED WIVES' TIME. Sanik's (1982) comparison of time-use clothing care data from 1967 and 1977 reveals that not only was the time input into clothing care of husbands and children not significant in 1967, it still was not significant 10 years later. Peskin (1982, p. 20) analyzed 1975-76 Michigan time-use data and found that the wives in the sample spent 2.4 hours a week doing laundry, compared to 0.1 hours by the husbands.

In Lovingood and Firebaugh's *Household Task Performance Roles of Husbands and Wives* (1978), the husbands and wives whom they surveyed agreed that not only did the wives actually do the laundry, the wives were also the ones to decide how it should get done.

Laundry, it appears, is "women's work". Even when employment status, education, and wage rate are taken into consideration, married women still seem to have the responsibility for doing laundry. Gramm (1974) determined that wives' wage rates did not significantly affect the amount of time that wives spent doing laundry, while Sanik (1982) found that time spent in clothing care by wives decreased with their participation in the paid labor force and with their increasing education. However, Sanik also found that husband's time in clothing care was unaffected by wives' employment status and level of education. The data for the children in the sample showed a slight increase in time devoted to clothing care when their mothers were employed, but the education level of the mother was not a factor in clothing care time of the children.

Hedges and Barnett (1972) reported that in case studies of families in the Boston/Amherst area, wives employed in professions that typically required a doctorate were just as responsible for doing the laundry as were women employed in less skilled occupations.

For whatever reasons, tastes and preferences, tradition, habit, etc., other family members' time often is not substituted for employed women's time in clothing care.

UTILIZATION OF LEAST-COST HOURS FOR HOUSEHOLD PRODUCTION ACTIVITIES. Robinson's *Summary of United States Time Survey* (1966) provides the most detailed time-use data available, broken down by individual days of the week. Examination of these data produces a fairly clear picture of the differences in daily time use between employed and nonemployed women.

The nonemployed women in Robinson's (1966) sample devoted more time to housecleaning, food preparation, and laundry (and mending) on the average weekday than they did on the average weekend day. In contrast, the employed women spent less time on these activities on the average weekday than they did on the average weekend day. In light of the additional weekday time constraints of employed women, this difference seems predictable.

It is interesting to note that even though the nonemployed women in Robinson's (1966) sample spent less time on housecleaning, food preparation, and laundry on the average weekend day than on the average weekday, they still devoted more time to housecleaning and food preparation on the average weekend day than did the employed women in the sample. Here the case of laundry differs from the other two activities: although the nonemployed women spent over three times as much time on laundry on the average weekday as did the employed women, they spent only 50% more time on Saturdays and two-thirds less time on Sundays (calculated from Table 11). As Vanek (1974) pointed out, the employed women appear to have been trying to "catch up" on the weekends even though they did less total nonmarket work on the weekends than did the nonemployed women. Robinson's (1966) data on leisure time indicate that nonemployed women have over two times as much leisure time as the employed women on the average weekday, but have *less* leisure time on Saturdays and an equal amount on Sundays (calculated from Table 11).

As stated earlier, Berk and Berk's (1979) study of household time-use activity patterns evidenced an interesting difference in the activity patterns during the weekday evening hours of the employed- and nonemployed-wife households in the sample. Berk and Berk (p. 177) note that the employed wives engaged in some "laundry preparation" after dinner, but the nonemployed wives in the sample did not.

Robinson's (1966) data and those of Berk and Berk (1979) suggest that employed women take advantage of their lower (opportunity) cost evening and weekend hours to engage in nonmarket production. However, these women also seem to attempt to salvage as much leisure

time as possible. The employed women in Robinson's survey spent less time on housecleaning and food preparation (and slightly more on laundry) on the weekends than did the nonemployed women, and they thereby managed to have slightly more weekend leisure time. The employed women in Berk and Berk's sample spent less than 10 minutes during the evening hours preparing laundry, but they did not actually *do* the laundry. Laundering may be an activity that can be "saved up" for the weekend hours, when leisure time is more abundant than it is in the evening hours. During the after-work evening hours there are some activities--such as meal preparation and clean-up, and child care--that cannot be put off until a more convenient time.

In summary, it appears that employed wives may rely on only two of the above strategies to reduce time pressures in clothing maintenance: reducing the quantity (or increasing the load size) of clean clothes produced, and utilizing least-cost weekend hours for producing these clean clothes.

Either one of these strategies may result in the need by the employed-wife household for larger inventories of clothing for all members of the household, not just the employed wife.

Summary of the Review of Literature

Neoclassical theory views the household solely as a consuming unit that exchanges its human capital for goods and services in the market. Household production theory, the "New Home Economics", views households as entities that also engage in nonmarket consumption and production activities. Becker (1965) and others view nonmarket production by households as production activities that combine purchased market goods and services with household time

to produce commodities from which the household gains utility. Within this framework, clean clothes and leisure are examples of commodities that can be both produced and consumed by the household.

The traditional labor/leisure paradigm has been challenged by Becker (1965) who presents the labor supply issue as an allocation decision between market and nonmarket time. Mincer (1962) and Gronau (1973a) expand this model by claiming that--especially for married women--time is allocated between leisure, work at home, and work in the market.

In general, employed married women appear to rely on the strategies of (1) reducing leisure, (2) reducing the quantity of household production, and (3) utilizing least-cost hours for household production in response to time pressures associated with labor force participation.

Inherent in Winakor's (1969) conceptualization of the clothing consumption process is the concept of clothing as a durable good. As such, clothing requires recursive maintenance which in turn requires time inputs and management on the part of the household. Since, in general, it is the wives who provide the household labor inputs into clothing-related production activities, married women's participation in the labor force tends to reduce the amount of time allocated to clothing maintenance activities.

It appears that employed wives rely on two strategies to reduce time pressures in clothing maintenance: reducing the quantity (or increasing the load size) of clean clothes produced, and utilizing least-cost weekend hours for producing clean clothes. Either one of these strategies may result in the need by the employed-wife household to increase expenditures for clothing in order to obtain larger inventories of clothing for all members of the household, not just the employed wife.

Cross-sectional research on expenditures for clothing indicates that clothing is a normal good, i.e., as household income changes, expenditures for clothing change in the same direction but

the change is less than unitary. Household expenditures for clothing increase with family size and are higher for girls and women than for boys and men. As education of the household head or of the wife increases, household expenditures for clothing have been found to increase as well.

Research indicates that women employed in professional occupations and in clerical and sales occupations have higher expenditures for clothing than do wives employed in blue collar occupations. It also has been found that blue collar married women's expenditures for clothing are not significantly different from those of homemakers.

Since expenditures for clothing in employed-wife households are higher than those in non-employed wife households, it is often assumed that these increased expenditures are solely as a result of increased expenditures on the wife's employment-related wardrobe. The impact of the wife's occupation on the *household's* expenditures for clothing has not been investigated.

Chapter 3. Setting of the Problem

The objective of this research was to determine the relationship, and the nature of the relationship, between married women's employment and household expenditures for clothing.

Theoretical Framework

Household production theory views the household as an entity that combines purchased goods and services with household time to produce commodities from which the household gains utility. Clean clothing is an example of a commodity that can be both produced and consumed by the household.

Household production theory recognizes that households make interrelated decisions with respect to the allocation of time between the home and the market, the purchase of goods and services from the market, and the production and consumption of commodities within the household.

Gronau (1973a) and Mincer (1962) assert that--especially for married women--the labor supply decision is more complex than just deciding how to allocate time between the home and the market. Married women must choose how to distribute their time among leisure, work at home, and work in the market. The decision of how to allocate time between the three is based on relative prices as well as on tastes and preferences. Changes in an individual's wage rate not only affect the quantity of labor supplied to the market, they alter the relative prices of time and goods, and therefore the relative prices and the consumption and production of commodities.

When married women enter the labor market, the opportunity cost of their nonmarket time increases. As a result, in combination with the increased constraints on their time, employed wives decrease time allocations to both leisure and household production. Evidence indicates that employed wives sacrifice much more leisure time than time in work at home.

In the case of clothing maintenance, time devoted to the production of clean clothes decreases when wives enter the labor force, as does (slightly) the number of loads of clean clothes produced. However, it appears that the primary time management strategy used by employed wives in the production of clean clothes is to utilize least-cost weekend hours in lieu of their only other option, after-work evening hours.

Goldberg (1977) has made a distinction between production housework and maintenance housework. She suggests that washing clothes is a maintenance activity--even though within the household production framework washing clothes would be viewed as a production activity. This distinction may be useful when theorizing about how different types of nonmarket hours are used.

Becker (1965) has pointed out that--just as the cost of time is not the same in all time periods--the cost of time is not the same for all commodities. Employed wives appear to shift production activities within their restricted nonmarket hours to allocate most nonleisure

weekday evening hours to relatively low cost production activities, such as meal preparation and child care. These activities are low cost relative to a maintenance activity such as laundry which does not have to be done on a daily basis if stocks are large enough.

Within this framework, it may be that employed wives utilize market produced goods (increased inventories of clothing) to assure that household clothing maintenance activities do not need to be done on a daily basis.

When expenditures for clothing increase in employed-wife households, it may be as a result of the wives' attempts to substitute the now relatively less expensive market goods for their relatively more expensive after-work evening hours. With sufficient stocks of clothing, clothing maintenance activities can be put off until the least expensive nonmarket hours--the weekend.

Instead of household expenditures for clothing increasing in employed-wife households because of expenditures on the wife's employment-related wardrobe, this increase may be as a result of increased expenditures for clothing for *all* family members. After controlling for income and wife's employment status or occupation, an increase in household expenditures for clothing is likely to be a household production phenomenon.

Hypotheses

Hypothesis 1

Households with employed women will exhibit higher levels of expenditures for clothing than will households with women who are homemakers, ceteris paribus.

Hypothesis 2

If households with employed women exhibit higher levels of expenditures for clothing than do households with women who are homemakers, then, ceteris paribus, these higher levels are attributable to higher levels of clothing expenditures for all members of the household, not just the employed woman.

Hypothesis 3

Expenditures for clothing by households with employed women will vary with respect to the occupations of the employed women, ceteris paribus.

Chapter 4. Procedure

The procedure used to conduct this research appears below. The sample and the data from which the sample was selected are described. The variables that are included in the empirical models are identified and operationally defined. The limitations of the proposed research are delineated, as are the assumptions.

A four-stage econometric analysis of the data included: (1) probit analysis to obtain predicted probabilities of wives' labor force participation; (2) tobit analysis to predict wives' wage rates; (3) tobit analyses of six separate clothing expenditure models that contain predicted values from (1) and (2); and (4) tobit analysis of a clothing expenditure model that contains predicted values from (2) in addition to dummy variables for wives' occupation. The models estimated appear below.

Wife's Labor Force Participation Model

$$(1) \quad E = \alpha_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \beta_6 X_6 + \beta_7 X_7 + \beta_8 D_1 + \beta_9 D_2 + \beta_{10} D_3 + \beta_{11} D_4 + \beta_{12} D_5 + \varepsilon_i$$

where E = wife's employment status (1=employed, 0=not employed); X_1 = wife's age in years; X_2 = wife's education in years; X_3 = other household income in dollars; X_4 = number of infants < 2 years old; X_5 = number of children 2-5 years old; X_6 = number of children 6-12 years old; X_7 = number of children 13-15 years old; D_1 = urban/rural (1=urban, 0=rural); D_2 = wife's race (1=white, 0=other); D_3 = Northeast (1=Northeast, 0=North Central); D_4 = South (1=South, 0=North Central); D_5 = West (1=West, 0=North Central); ε_i = disturbance term.

Predicted probabilities of E, E^*, were obtained for each married woman in the sample. E^* is the predicted probability that the wife is employed (p=0-1).

Wife's Wage Rate Model

$$(2) \quad W = \alpha_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \beta_6 X_6 + \beta_7 X_7 + \beta_8 D_1 + \beta_9 D_2 + \beta_{10} D_3 + \beta_{11} D_4 + \beta_{12} D_5 + \varepsilon_i$$

where W = wife's actual wage rate (> 0 if employed, = 0 if not employed); X_1 = wife's education in years; X_2 = wife's work experience in years; X_3 = other household income in dollars; X_4 = number of infants < 2 years old; X_5 = number of children 2-5 years old; X_6 = number of children 6-12 years old; X_7 = number of children 13-15 years old; D_1 = urban/rural (1=urban, 0=rural); D_2 = wife's race (1=white, 0=other); D_3 = Northeast (1=Northeast,

0=North Central); D_4 = South (1=South, 0=North Central); D_5 = West (1=West, 0=North Central); ε_i = disturbance term.

Predicted estimates of W, W^*, were obtained for each wife in the sample. W^* is the predicted estimate of the wife's wage rate (the value or opportunity cost of the wife's time).

Clothing Expenditure Model (With Wife's Employment Status)

$$
\begin{aligned}
Y_i = {} & \alpha_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \beta_6 X_6 + \beta_7 X_7 + \beta_8 X_8 \\
& + \beta_9 D_1 + \beta_{10} D_2 + \beta_{11} D_3 + \beta_{12} D_4 + \beta_{13} D_5 + \beta_{14} D_6 \\
& + \beta_{15} D_7 + \beta_{16} D_8 + \beta_{17} E^* + \beta_{18} W^* + \varepsilon_i
\end{aligned} \tag{3}
$$

This model was estimated separately for each of the following dependent variables, each measured in dollars:

Y_1 = household expenditures for clothing (per average family member); Y_2 = expenditures for women's clothing; Y_3 = expenditures for men's clothing; Y_4 = expenditures for average girl's clothing; Y_5 = expenditures for average boy's clothing; Y_6 = expenditures for average infant's clothing.

For each estimation of the above model, the explanatory variables were:

X_1 = other household income in dollars; X_2 = number of infants < 2 years old; X_3 = number of girls 2-5 years old; X_4 = number of girls 6-12 years old; X_5 = number of girls 13-15 years old; X_6 = number of boys 2-5 years old; X_7 = number of boys 6-12 years old; X_8 = number of boys 13-15 years old; D_1 = urban/rural (1=urban, 0=rural); D_2 = wife's race (1=white, 0=other); D_3 = Northeast (1=Northeast, 0=North Central); D_4 = South (1=South, 0=North

Central); D_5 = West (1=West, 0=North Central); D_6 = Fall (1=Fall, 0=Summer); D_7 = Winter (1=Winter, 0=Summer); D_8 = Spring (1=Spring, 0=Summer); E^* = predicted probability that the wife is employed (obtained from equation 1); W^* = predicted estimate of the wife's wage rate (obtained from equation 2); ε_i = disturbance term.

Clothing Expenditure Model (With Wife's Occupation)

$$
\begin{aligned}
Y = {} & \alpha_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \beta_6 X_6 + \beta_7 X_7 + \beta_8 X_8 \\
& + \beta_9 D_1 + \beta_{10} D_2 + \beta_{11} D_3 + \beta_{12} D_4 + \beta_{13} D_5 + \beta_{14} D_6 + \beta_{15} D_7 \\
& + \beta_{16} D_8 + \beta_{17} D_9 + \beta_{18} D_{10} + \beta_{19} D_{11} + \beta_{20} W^* + \varepsilon_i
\end{aligned} \tag{4}
$$

This model was estimated once, with household expenditures for clothing (in dollars, per average family member) as the dependent variable.

The explanatory variables were:

X_1 = other household income in dollars; X_2 = number of infants < 2 years old; X_3 = number of girls 2-5 years old; X_4 = number of girls 6-12 years old; X_5 = number of girls 13-15 years old; X_6 = number of boys 2-5 years old; X_7 = number of boys 6-12 years old; X_8 = number of boys 13-15 years old; D_1 = urban/rural (1=urban, 0=rural); D_2 = wife's race (1=white, 0=other); D_3 = Northeast (1=Northeast, 0=North Central); D_4 = South (1=South, 0=North Central); D_5 = West (1=West, 0=North Central); D_6 = Fall (1=Fall, 0=Summer); D_7 = Winter (1=Winter, 0=Summer); D_8 = Spring (1=Spring, 0=Summer); D_9 = wife's occupation (1=Professional, 0=Homemaker); D_{10} = wife's occupation (1=Traditional, 0=Homemaker); D_{11} = wife's occupation (1=Uniformed, 0=Homemaker); W^* = predicted estimate of the wife's wage rate (obtained from equation 2); ε_i = disturbance term.

The Data

This research employs data obtained from the public use tapes of the Quarterly Interview component of the 1980-81 Consumer Expenditure Survey (CES), conducted by the Bureau of Labor Statistics (BLS, 1985):

> The Quarterly Interview component of the survey was designed to collect data on major items of expense, household characteristics, and income. The expenditures covered by the survey were those which respondents could be expected to recall fairly accurately for 3 months or longer. Each sample household was interviewed once per quarter for five consecutive quarters. Data collected in each quarter were considered independent so that annual estimates were not dependent upon the participation of a consumer for the full five quarters (p. 2).
>
> The unit of analysis, or the unit for which expenditure reports are collected is the set of eligible individuals comprising a "consumer unit". A consumer unit consists of all members of a particular housing unit or other type of living quarters who are related by blood, marriage, adoption, or some other legal arrangement, such as foster children. Consumer unit determination for unrelated persons is based on financial independence (p. 4).
>
> The sample design is a rotating panel survey in which approximately 8400 addresses are contacted in each of the five calendar quarters. Allowing for bounding interviews, which are not included in estimates, and for nonresponse (including vacancies), the number of completed interviews per quarter is targeted at 4800. Each month, one-fifth of the units interviewed are new to the survey. This panel--and all others--is interviewed for five consecutive quarters and then dropped from the survey (pp. 4-5).

The Sample

The CES public use tapes contain quarterly expenditure data from the first quarter of 1980 through the first quarter of 1982. The data that were employed in this research were obtained from the fourth quarter of 1980 and the first, second, and third quarters of 1981.

An exhaustive subsample was culled from the CES sample for the quarters indicated. The criteria for admissability of consumer units, CUs, into the sample were:

1. Husband and wife families with at least one child less than 16 years of age, and

2. The husband worked full time for the year under study, and

3. The husband, or the husband and the wife, are the only CU income earners, and

4. The wife was either not employed or was employed in a selected Professional, Traditional, or Uniformed occupation during the twelve months previous to the interview quarter, and

5. The CU's before-tax income for the year prior to the interview quarter was greater than zero.

The subsample consisted of 2,285 households that fit the above criteria for the year under consideration. The data were used as quarterly data; data within each quarter are statistically independent of those in the other quarters selected. Annual income and employment-related data for the year prior to each interview quarter were obtained from the public use tapes.

Operational Definitions

Descriptions of the selected primary (unaggregated, untransformed) CES variables listed below are as they appear in the public use tape documentation (BLS, 1985). CES variable names appear in parentheses. Interchangeable terms, transformed variables, and CES expenditure and occupation variables that have been aggregated for use in the proposed research will be operationally defined in the appropriate sections below.

Household Variables

Consumer Unit (CU)

A consumer unit comprises all members of a particular household who are related by blood, marriage, adoption, or other legal arrangements.

Household

All CES CUs that fit the sample selection criteria. For the purposes of this research, households and families are interchangeable terms.

Family Composition

CHILDREN. Infants < 2. The number of girls and boys less than two years old.

Boys 2-5. The number of boys from 2 to 5 years old.

Boys 6-12. The number of boys from 6 to 12 years old.

Boys 13-15. The number of boys from 13 to 15 years old.

Girls 2-5. The number of girls from 2 to 5 years old.

Girls 6-12. The number of girls from 6 to 12 years old.

Girls 13-15. The number of girls from 13 to 15 years old.

Children 2-5. The number of children from 2 to 5 years old.

Children 6-12. The number of children from 6 to 12 years old.

Children 13-15. The number of children from 13 to 15 years old.

MEN. The husbands, the fathers.

WOMEN. The wives, the mothers.

Family Size (FAM_SIZE)

Number of members in CU.

Family Income (FINCBTAX)

Total amount of (annual) family income before taxes, for the year prior to the interview quarter.

Other Household Income

Other Household Income = Family Income - Wife's Total Income.

Urban/Rural (BLS_URBN)

Urban households consist of those in Standard Metropolitan Sampling Areas (SMSA's) and in urbanized areas and urban places of 2,500 or more persons outside of SMSA's. Urban, as defined by the BLS, includes rural populations within each SMSA. Rural households are those not classified as urban.

Region (REGION)

Northeast, North Central, South, and West (urban areas only).

Wife's Variables

Wife's Age (AGE)

Age in years.

Wife's Education (EDUCA)

Highest grade attended (measured by total years of schooling). 00 Never attended; 01-08 Elementary; 09-12 High school; 13-18 College.

Wife's Race (RACE)

Wives who were black, American Indian, Eskimo, Asian, or Pacific Islander were classified as other. Otherwise, they were classified as white.

Wife's Salary (SALARYX)

Annual amount of salaried income received before deductions for the year prior to the interview quarter.

Wife's Other Income (NONFARMX)

Annual amount of (prededuction) income received from a nonfarm business partnership or professional practice, for the year prior to the interview quarter.

Wife's Total Income

Wife's Total Income = Wife's Salary + Wife's Other Income

Wife's Weekly Hours of Work (INC_HRSQ)

Number of hours worked per week in paid employment.

Wife's Annual Weeks Worked (INCWEEKQ)

Number of weeks worked full or part time in paid employment in the last 12 months.

Wife's Wage Rate

The following CES variables were used to calculate *actual* wage rates, *W*, for the employed wives in the sample:

Wife's Total Income / (Wife's Annual Weeks Worked × Wife's Weekly Hours of Work).

The value of the wife's time, whether or not she participated in the paid labor force, is referred to as the *predicted* estimate of the wife's wage rate, W^*.

Wife's Work Experience

Wife's Work Experience = (Age - Education - 5 Years).

The number of years that the wife had available for work, either in the home or in the paid labor force. To account for preschool years, five years were subtracted from the years that remained after schooling.

Wife's Employment Status

If wives had been employed in selected Professional, Traditional, or Uniformed occupations during the twelve months previous to the interview quarter, they were classified as employed. Otherwise, they were classified as not employed.

Wife's Occupation (OCCUPREV)

Occupation from which the wife received the most earnings in the past year.

The CES categorizes occupation into 109 categories: 51 salaried and 51 self-employed categories (for both, the base occupation(s) is(are) the same, but the type of income is different); and seven categories of not employed.

Some of the CES categories contain one occupation (e.g., Accountants, Salaried, or Accountants, Self-Employed). Other categories are aggregates of related occupations, for example, Health Workers, Self-Employed. The CES data also contain occupational categories that are conglomerates of occupations. For example, the CES includes the following occupations in one category:

> Bakers; Cabinet Makers; Decorators and Window Dressers; Dental Lab Technicians; Furniture and Wood Finishers; Furriers; Jewelers and Watchmakers; Grain, Flour and Feed Millers; Opticians; Lens Grinders and Polishers; Piano Tuners and Repair Persons; Shoe Repairmen; Stonecutters; Carvers; Tailors; Upholsterers; Glaziers; Sign Painters and Letterers; Motion Picture Projectionists; Telephone Installers; Repairmen; Linesmen and Splicers; Other Craft and Kindred Workers not specified, Salaried (BLS, 1985, p.47).

The CES data do not classify wives' occupations in a manner that was directly usable in this research. This research included wives' occupations in order to investigate their impact on expenditures for clothing. Accordingly, a classification scheme was developed to aggregate selected CES occupation categories by "employer/workplace expectations" with respect to employment-related personal wardrobe.

It was necessary to use aggregations of the CES categories in order to make comparisons between expenditures for clothing by women employed in occupations with similar employer/workplace expectations (and similar incomes) and expenditures for clothing by the nonemployed women in the sample.

The aggregate occupation categories that were used are "Professional", "Traditional", "Uniformed", and "Not Employed". The employer/workplace expectations associated with each were considered to be high, moderate, low, and none, respectively.

This research used 46 selected CES occupation categories. If aggregation had not been performed, the empirical model would have contained 45 dummy variables for the wives' occupations. If wives' occupation had been modeled in this manner, it would have permitted comparison only between two relatively specific occupations at a time, e.g., between expenditures for clothing by self-employed accountants and those of wives who were not employed because they could not find work.

Not all of the CES occupational categories were selected for use. Some CES categories do not represent occupations that women typically hold (e.g., the category that contains Blacksmiths; Boilermakers; Forgemen, and Hammermen; Heat Treaters, Annealers, Temperers; Job and Die Setters; Machinists and Apprentices...(BLS p.46). Aggregation of such categories into a "Nontraditional" category was not expected to yield enough observations to make reasonable comparisons.

Some conglomerate CES categories were not selected because the occupations within the category were not considered to face the same level of employer/workplace expectation with respect to employment-related personal wardrobe. Other CES categories were not selected because they are not exclusive to any one of the categories developed for this research. Doctors and Dentists were considered to be both Professional and Uniformed and as such, were not selected.

Of the seven CES not-employed categories, two were selected for use in the proposed research; Not Working-Taking Care of Home/Family, and Not Working-Could Not Find Work. Other CES not-employed categories--e.g., Not Working-Going to School, or Not Working-Ill,

Disabled, Unable to Work--were not considered to represent women with the same clothing needs as those in the not-employed categories selected.

The following is the occupational classification scheme that was developed for this study.

OCCUPATION, PROFESSIONAL. Individuals employed in the professional occupations listed below usually face fairly high employer/workplace expectations with respect to their employment-related personal wardrobes. In general, these individuals have extensive professional contact with the public, and often act as representatives of their employers, firms, etc. In addition, individuals employed in the following occupations have moderate to high incomes.

The following CES occupations (both salaried and self-employed) were aggregated into Professional:

Accountants
Advertising Agents and Sales Persons
Bank Officers, Financial Managers, and Credit Persons
Insurance Agents, Brokers and Underwriters, Real Estate Agents and Brokers
Managers and Administrators in Manufacturing
Managers and Administrators in Retail Trade
Managers and Administrators in Other Industries
Other Professional, Technical and Kindred Workers
School Administrators
Stock and Bond Salespersons

OCCUPATION, TRADITIONAL. Traditionally, American women have been employed as school teachers and retail sales, clerical, and health workers. (Health workers usually wear uniforms

to work and therefore, have been placed in the Uniformed category below.) There are usually moderate employer/workplace expectations with respect to employment-related personal wardrobes for women in the traditional occupations listed below. Individuals employed in these occupations do interact with the public, but primarily in a service capacity. In general, women employed in these traditional occupations earn moderate to low salaries.

The following CES occupations (both salaried and self-employed) were aggregated into Traditional:

Bookkeepers
Other Clerical Workers
Sales Workers in Retail Trade
Secretaries, Stenographers and Typists
Teachers, except college and university

OCCUPATION, UNIFORMED. For the most part, individuals employed in the following occupations are expected to wear uniforms on the job, whether provided by the employer or the worker. Therefore, there are low employer/workplace expectations with regard to employment-related personal wardrobes. Individuals employed in these uniformed occupations usually receive moderate to low salaries.

The following CES occupations (both salaried and self-employed) were aggregated into Uniformed:

Cleaning Service Workers (except private household)
Food Service Workers (except private household)
Health Service Workers (except private household)
Health Workers, except practitioners
Mail Handlers and Postal Clerks

Personal Service Workers (except private household)

Private Household Workers:

Childcare Workers, Maids, Cooks, Housekeepers, Laundresses.

OCCUPATION, NOT EMPLOYED. Wives who are not employed in the labor force do not face employer/workplace expectations with regard to employment-related wardrobe. These women may be subject to their families' or communities' expectations, but these are not labor force related. For the purposes of this research, wives who fall into the Not Employed category are also referred to as homemakers.

The following CES occupations were aggregated into Not Employed:

Not Working-Could Not Find Work (Unemployed)

Not Working-Taking Care of Home/Family

Expenditure Variables

Expenditures for Clothing

Quarterly expenditures for clothing items that were purchased by each of the households for the family members' own consumption comprise the expenditure data set. Expenditures for clothing items that were purchased as gifts--clothing that would transfer out of the household for consumption--were excluded.

EXPENDITURES, AVERAGE BOY'S AGGREGATE. The following CES expenditure categories of Boys' clothing were aggregated into total household expenditures for Boys' clothing, "Total Boys' Aggregate":

Boys' Coats and Jackets
Boys' Hosiery
Boys' Nightwear
Boys' Pants
Boys' Shirts
Boys' Shorts and Shorts sets
Boys' Suits, Sportcoats, and Vests
Boys' Sweaters
Boys' Underwear
Boys' Uniforms and Active Sportswear
Boys' Other Clothing

Average aggregate expenditures for Boy's clothing, "Boy's", were obtained by deflating each household's Total Boys' Aggregate by the number of boys 2-15 years old in each household.

EXPENDITURES, AVERAGE GIRL'S AGGREGATE. The following CES expenditure categories of Girls' clothing were aggregated into total household expenditures for Girls' clothing, "Total Girls' Aggregate":

Girls' Active Sportswear
Girls' Coats and Jackets
Girls' Dresses and Suits
Girls' Hosiery
Girls' Shirts, Blouses, Sweaters and Vests

Girls' Shorts and Shorts Sets

Girls' Skirts and Pants

Girls' Underwear and Nightwear

Girls' Uniforms

Girls' Other Clothing

Average aggregate expenditures for Girl's clothing, "Girl's", were obtained by deflating each household's Total Girls' Aggregate by the number of girls 2-15 years old in each household.

EXPENDITURES, AVERAGE INFANT'S AGGREGATE. The following CES expenditure categories of Infants' clothing were aggregated into total household expenditures for Infants' clothing, "Total Infants' Aggregate":

Infants' Coats, Jackets, and Snowsuits

Infants' Dresses and Outerwear

Infants' Hosiery, Footwear, and Other Clothing

Infants' Sleeping Garments

Infants' Undergarments, including Diapers

Infants' Other Clothing

Average aggregate expenditures for Infant's clothing, "Infant's", were obtained by deflating each household's Total Infants' Aggregate by the number of infants less than two years old in each household.

EXPENDITURES, MEN'S AGGREGATE. The following CES expenditure categories of Men's clothing were aggregated into total household expenditures for Men's clothing, "Men's":

Men's Active Sportswear

Men's Coats and Jackets

Men's Hosiery

Men's Nightwear

Men's Pants

Men's Shirts

Men's Shorts and Shorts Sets

Men's Sportcoats

Men's Suits

Men's Sweaters and Vests

Men's Underwear

Men's Uniforms

Men's Other Clothing

As the sample is defined, Men's clothing is that which was purchased for the husband.

EXPENDITURES, WOMEN'S AGGREGATE. The following CES expenditure categories of Women's clothing were aggregated into total household expenditures for Women's clothing, "Women's":

Women's Active Sportswear

Women's Coats and Jackets

Women's Dresses

Women's Hosiery

Women's Nightwear

Women's Pants

Women's Shirts, Tops, and Blouses

Women's Shorts and Shorts Sets

Women's Skirts and Culottes

Women's Sportcoats and Tailored Jackets

Women's Suits

Women's Undergarments

Women's Uniforms

Women's Vests and Sweaters

Women's Other Clothing

As the sample is defined, Women's clothing is that which was purchased for the wife.

EXPENDITURES, HOUSEHOLD. Total Household Expenditures for clothing were obtained by summing over Total Boys' Aggregate, Total Girls' Aggregate, Total Infants' Aggregate, Men's Aggregate, and Women's Aggregate expenditures for clothing and deflating by family size.

Seasonal Variables

The seasonal variables are actually the BLS quarterly divisions: Fall = Q804 (fourth quarter of 1980). Winter = Q811 (first quarter of 1981); Spring = Q812 (second quarter of 1981); Summer = Q813 (third quarter of 1981). The seasonal variables are only rough approximations of seasons as a result of the staggered data collection scheme of the CES, whereby each month 20% of the sample was new and 20% was being interviewed for the last time. Households interviewed in one quarter have monthly expenditure data associated with them that do not necessarily match the expenditure months of the other households in the same quarter. For example, within BLS reference quarter 801--Q801--there are data on households interviewed in October, November, and December. However, within each month there are households who have expenditure data for one-, two-, or three-month periods, depending on when they entered the staggered collection scheme. This collection scheme results in some overlap of months

between seasons: 804 (fourth quarter of 1980) = Fall which contains expenditure data for the months of August, September, October, November, and December; Q811 (first quarter of 1981) = Winter which contains expenditure data for the months of November, December, January, February, and March; Q812 (second quarter of 1981) = Spring which contains expenditure data for the months of February, March, April, May, and June; Q813 (third quarter of 1981) = Summer which contains expenditure data for the months of May, June, July, August, and September.

Limitations

The fundamental limitation of this study lies in the nature of the data. Secondary data are appealing because they often can be obtained at substantially less cost than that associated with the collection of comparable primary data. In addition, the large size of secondary data sets obtained from government agencies or private industry is often beyond what a researcher could obtain independently.

The drawbacks associated with the use of secondary data correlate with the benefits discussed above. Although the researcher does not incur the direct cost of data collection, there are costs associated with the lack of control over how and what data are collected. Due to its enormous size, hundreds of people--interviewers, coders, programmers-- are involved in the collection of CES data, which can result in inconsistencies and loss of information.

Secondary data are collected to provide information in accordance with the collecting agency's interests; in some respects, the secondary user must tailor his or her analysis to the

available data. The form of the CES clothing expenditure data made available to the public by the Bureau of Labor Statistics was a source of compromise in this research.

The CES expenditure data for Girls' and for Boys' clothing are aggregated by categories of clothing, over all girls and over all boys 2-15 years old in each household. As a result, clothing expenditures for specific girls and boys in this age group are unidentifiable. Since the sample in this research contains families with varying numbers of such girls and boys, these aggregate expenditure categories were deflated by the number of girls or the number of boys 2-15 years old in each household so as to obtain at least a sense of "average" aggregate household expenditures for clothing for such girls and boys.

The CES expenditure classification for age groups above Girl's and Boy's is Women's and Men's, aged 16 and over. This classification makes it impossible to distinguish clothing expenditures for older teenaged girls and boys from those for their mothers and fathers, respectively. In order to assure that expenditures for Women and Men were for the mothers and fathers, respectively, and not for older teenagers of the same sex, the sample included only those families with children less than 16 years old who fit the other criteria for admissability of data.

Finally, the external validity of the sample is not assured since the subsample from the CES data was not chosen randomly. Therefore, it will not be possible to generalize the results of this research to the population at large.

Assumptions

The initiation of this research rested upon the following assumptions:

1. The data were recalled, reported, and recorded accurately.

2. The occupational classification scheme developed by the researcher accurately aggregated occupations in terms of employer/workplace expectations with respect to employment related personal wardrobe.

3. Self-employed wives exhibit the same clothing consumption behavior and face the same employer/workplace expectations with respect to employment-related personal wardrobe as do the salaried wives in corresponding occupations.

4. Nonemployed and employed wives purchase the same quality items of clothing, i.e., spend the same amount per item, ceteris paribus.

5. Nonemployed and employed wives engage in the same amount of home sewing activity, ceteris paribus.

6. Clothing expenditures are equal for female and male infants under the age of two.

7. Average aggregate girl's and average aggregate boy's levels of expenditures for clothing accurately reflect average aggregate expenditures for all girls and for all boys 2-15 years old in each household.

8. Purchases of women's clothing were intended for use by the wife; purchases of men's clothing were intended for use by the husband; purchases of girls' clothing were intended for use by girls 2-15 years old in the household; purchases of boys' clothing were intended for

use by boys 2-15 years old in the household; and purchases of infants' clothing were intended for use by infants under the age of two in the household.

Analysis of the Data

As stated earlier, the data were analyzed in four stages: (1) probit analysis to obtain predicted probabilities of wives' labor force participation; (2) tobit analysis to predict wives' wage rates; (3) tobit analyses of six separate clothing expenditure models (expenditures for household, women's, men's, girl's, boy's, and infant's clothing) that contain predicted values from (1) and (2); and (4) tobit analysis of a household clothing expenditure model that contains predicted values from (2) in addition to dummy variables for wives' occupation.

The focus of the empirical analysis was the estimation of the clothing expenditure models 3 and 4. Tests of Hypotheses 1 and 2 were performed using equation 3. The test of Hypothesis 3 was performed using equation 4.

The probit analysis of equation 1 and the tobit analysis of equation 2 were performed in order to obtain predicted probabilities of wives' labor force participation and predicted estimates of wives' wage rates, respectively, for subsequent use as explanatory variables in the clothing expenditure models. It is possible to obtain employment status and wage rate information from the CES tapes, but these data could not be used directly in the estimations of the clothing expenditure models. The inappropriateness of these data for use in the clothing expenditure models will be dicussed below.

The quantity of clothing demanded by the household, the quantity of the wife's leisure time demanded by the household, and hours of the wife's labor force participation (and therefore

employment status and wage rate) are all endogenous variables. They are not exogenous (independent) since the household makes simultaneous decisions about the number of hours the wife devotes to paid labor (and therefore her earnings) and the quantity of clothing and of the wife's leisure time it demands. The reasoning is as follows.

The household derives utility from clothing, C, all other goods, G, and the wife's leisure time, l:

$$U = u(C, G, l).$$

In maximizing uitility, the household faces an expenditure constraint equal to the price of clothing times the quantity of clothing, PcC, plus the price of all other goods times the quantity of those goods, PgG. Assuming that all income in the period is spent on C and G , expenditures must equal the wife's wage rate, w, multiplied by the hours of the wife's labor force participation, L, plus household income, Y , less the wife's earnings, wL. Thus,

$$PcC + PgG = wL + (Y - wL).$$

The wife's total time constraint, T, is the sum of hours of labor force participation, L, and hours of nonmarket time, N, where N is the sum of the wife's leisure time, l, plus her household production time, H.

$$T = L + N.$$

$$N = l + H.$$

By substitution,

$$PcC + PgG = w(T - N) + (Y - w(T - N)).$$

Therefore, the household simultaneously chooses the wife's hours of labor force participation, L, (and therefore, the wife's earnings), the quantity of clothing, C, and the quantity of the wife's

nonmarket time, N (and thus, the quantity of the wife's leisure time, l) as it maximizes utility under the expenditure-income constraint.

If any of one of the clothing expenditure models was estimated with endogenous explanatory variables, e.g., wife's labor force participation, the error term associated with the dependent clothing expenditure variable, (σ_i), would be correlated with the error associated with the right-hand endogenous variables and the estimates obtained from the model would be biased. The use of the concept of conditional demand functions, introduced by Pollak (1969), is a way of accounting for the household's simultaneity in decision making.

Pollak (1969) states that much of consumer behavior is fixed in the short run. He uses the concept of conditional demand functions to account for such fixed commitments by consumers. Pollak proposes the use of conditional demand functions in the analysis of the effect of leisure (and labor) on the consumption of goods, since hours of labor are usually institutionally predetermined (and therefore, preallocated by the consumer). Thus the consumer's demand for goods in the present is conditional on--constrained by--decisions made in the past.

With regard to this research, the occupation of the wife was assumed to have been determined in the past, i.e., she was a nurse or a lawyer before the time of the data collection. Occupation was considered to be one of the wife's predetermined characteristics--just as were the number of children she had and where she lived. The household also might have been assumed to choose the number of hours of wife's labor force participation (and therefore, her employment status) and *then* choose the quantity of clothing to purchase. In the case of such sequential decision making, hours of wife's labor force participation would no longer be endogenous and could be employed as an explanatory variable in the clothing expenditure models. However, it was established above that the clothing expenditure and labor supply decisions are *simultaneous* in nature, not sequential.

Pollak's (1969) concept can still be applied here since he allows for the case where an ordinary (unconditional) demand function equals a conditional demand function. If the demand for the fixed quantity (hours of wife's labor force participation) is fixed at the level that the household *would have chosen anyway*, without the institutional constraints or preallocation, then the ordinary and conditional demand functions are equal. Employment of this identity allowed the use of wife's employment status and wage rate variables in the clothing expenditure models. These variables remained endogenous, however, so they had to be dealt with econometrically to avoid introducing bias.

The use of *predicted* probabilities of labor force participation obtained from the probit analysis, and *predicted* estimates of wives' wage rates obtained from the tobit analysis, as explanatory variables in the clothing expenditure models assured that the parameter estimates would not be biased as a result of simultaneity in decision making by the household. Predicted values do not have a distribution associated with them, therefore, there are no associated error terms that could correlate with those of the clothing expenditure models.

Models 1 and 2 differ in only one of the right-hand side variables; the wife's age appears in model 1 while the wife's years of work experience appears in model 2. The other explanatory variables are the same since it was assumed that the same variables affected the wife's nonmarket and market productivity, thus affecting her decision to enter the labor market as well as her wage rate.

The wife's education was expected to positively affect employment status as well as wage rate. Other household income was anticipated to have a negative impact on employment status since the wife might have had less incentive to seek employment if household income was high. The effect of other household income on wife's wage rate was less certain. Gronau (1973b) points out that progressive taxation makes the wife's wage rate (after taxes) a function of the husband's earnings, suggesting a negative relationship between other household income and wife's wage rate.

The presence of children was expected to negatively affect wage rates, assuming the wife's household time was relatively more valuable when children were at home. It was anticipated that younger children would have more of a negative impact on the wife's employment status than would older children.

The urban/rural and race variables were included to control for prices (Zick & Bryant, 1983), as were the variables representing region. These variables were thought to have a potential effect on the employment decision as well as on wages.

Probit Analysis of Wife's Labor Force Participation

Probit is a method of analysis appropriate to qualitative choice regression models (Capps, 1983; Kinsey, 1984; Maddala, 1983). Models in which the dependent variable is qualitative–dichotomous in nature– are often used to determine the probability that individuals with a given set of attributes will make one choice rather than its alternative, e.g., the case of obtaining probabilities of wives' labor force participation (Gerner & Zick, 1983; Gronau, 1973b).

Probit analysis was used in this research to obtain the probability of employment for each wife in the sample. First, the employment status (1 = employed, 0 = not employed) of each wife in the sample was regressed on the explanatory variables in model 1. The resulting equation was used to predict probabilities of employment for each wife in the sample. These predicted probabilities were then used as independent variables in clothing expenditure model 3 without introducing bias since, as *predicted* probabilities, they did not include the error associated with *actual* hours worked.

Tobit Analysis of Wife's Wage Rate

Tobit analysis is appropriate for analyzing censored response models. The sample used in this research is censored since data on the independent variables exist for all the wives in the sample, but wage rates are only observed for the employed wives. Whether the wife was employed or not, her time had value. Therefore, she had a wage rate (an opportunity cost of time), whether she was paid or not. If least squares had been used to analyze these data-- using zeros for the wage rates of nonemployed wives-- the estimates would have been inconsistent.

The potential for obtaining inconsistent estimates was avoided by use of tobit. First, tobit was run on the whole sample, using actual wage rates as the dependent variable (wage rates of zero were used for the nonemployed wives). The resulting equation was used to obtain predicted estimates of wage rates for all the wives in the sample. As in the probit analysis above, these predicted values were purged of the error associated with actual hours of work so it was possible to use them in models 3 and 4 without introducing bias.

Tobit Analysis of Expenditures for Clothing

Tobit analysis also was employed to analyze the clothing expenditure models, equations 3 and 4. As stated, tobit is an appropriate econometric technique when there are zero observations on the dependent variable for some portion of the sample, with the nonzero observations continuous above or below zero. Expenditure data often are characterized by a significant number of observations clustered at zero (the nonpurchasers in the sample) with the rest of the observations continuous above zero.

The CES expenditure data used here are quarterly (three-month) expenditures for clothing. As such, many households recorded zero expenditures for household or individual family members' clothing. The percentage of zero observations for each expenditure category appear in Table 1 on page 81 (absolute numbers in parentheses).

Clothing expenditure model 3 was estimated separately for expenditures for household, women's, men's, girl's, boy's, and infant's clothing. Household expenditures for clothing were estimated in order to test the hypothesis that household expenditures increased when wives were employed. Clothing expenditures for women, men, girls, boys, and infants were estimated separately in order to test whether clothing expenditures for *all* members of the household increased when wives were employed.

The predicted values obtained from the probit and tobit analyses above were used as explanatory variables in Model 3. It was expected that the predicted probabilities of wives' employment would positively affect expenditures for clothing since more clothing would be demanded to increase clothing inventories when wives were employed.

Clothing expenditure model 4 was estimated once, with household expenditures for clothing as the dependent variable. Model 4 differs from model 3 only in the representation of the wives' employment. Model 3 contains the predicted probability of employment status obtained from the probit analysis, whereas model 4 contains three dummy variables for wives' occupation. The occupational categories are Professional, Traditional, and Uniformed. It was anticipated that wives' employment in these categories would positively affect household expenditures for clothing in these households, versus those of household expenditures for clothing by households with wives who were not employed (the base category).

Since the other explanatory variables in models 3 and 4 are the same, they will be discussed jointly below.

Table 1. Zero Expenditures For Clothing

PERCENT ZERO CLOTHING EXPENDITURES
(ABSOLUTE NUMBERS IN PARENTHESES)

EXPENDITURE CATEGORY	ZERO EXPENDITURES
HOUSEHOLD	7.1% (162)
WOMEN'S	26% (597)
MEN'S	44% (1008)
GIRL'S	63% (1449)
BOY'S	61% (1389)
INFANT'S	76% (1729)

The predicted estimates of the wives' wage rates were expected to positively affect expenditures for clothing; as the value of the wives' time increased, they could substitute goods (increased inventories of clothing) for time. Other household income (family income separate from the wife's employment related income) also was anticipated to positively affect expenditures for clothing. This variable served primarily as a control variable to account for the fact that the households in the sample had varying levels of income.

Numbers of children were disaggregated into seven age/sex categories to capture the effects of children of different ages and sexes on expenditures for clothing. The literature suggests that older children, especially girls, have a greater positive impact on household expenditures for clothing than do younger children or male children of the same age.

The effects of the urban/rural and race variables were uncertain. These variables were included as controls for prices, as were the regional variables. The seasonal variables were included also as control variables; it was anticipated that clothing expenditures in the Fall and Winter quarters would be higher than those in Summer (the base category), while the direction and magnitude of the Spring quarter dummy variable was uncertain.

In both probit and tobit analysis the parameter coefficients are estimated by the method of maximum likelihood. However, in tobit analysis the regression coefficients that are obtained are not derivatives ($\partial E(Y)/\partial X_i$) as is the case in probit and least squares analysis. Tobit estimates a vector of normalized coefficients which, when multiplied by the standard error of the estimate, produces a vector of regression coefficients. Multiplication of these regression coefficients by the cumulative standard normal distribution function transforms them into derivatives that are analogous to the regression coefficients in least squares. The significance of the individual independent variables was tested with t-tests. Ephron's R^2 was calculated for each estimation of the clothing expenditure models. Ephron's R^2 is a measure of goodness of fit analogous to the more familiar R^2 obtained from least squares: Ephron's $R^2 = 1 - (RSS/TSS)$ where RSS is residual sum of squares and TSS is total sum of squares.

Tests of Hypotheses

Test of Hypothesis 1

The first hypothesis, stated in the null form, is that households with employed women do not exhibit higher levels of expenditures for clothing than do households with women who are homemakers.

The test of Hypothesis 1 was conducted on model 3, when estimated with household expenditures for clothing as the dependent variable. Hypothesis 1 was tested by calculating the derivative of Y_1 with respect to E^*, the predicted probability that the wife was employed. The derivative indicates the change in household expenditures for clothing--in dollars per quarter, per average family member--given a change in the predicted probability that the wife is employed, all else constant.

Test of Hypothesis 2

The second hypothesis, in the null form, is that if households with employed women do exhibit higher levels of expenditures for clothing than do households with women who are homemakers, then these higher levels are not attributable to higher levels of expenditures for clothing by members of the household other than the employed wife.

Hypothesis 2 was tested on model 3 when it was estimated with expenditures for Women's, Men's, Girl's, Boy's, and Infant's clothing as the dependent variables. Hypothesis 2 was tested by calculating the derivatives of Y_2 , Y_3, Y_4, Y_5, and Y_6 with respect to E^*. The derivatives

indicate the change in expenditures for clothing--in dollars per quarter, for each household member--given a change in the predicted probability that the wife/mother is employed, ceteris paribus.

Test of Hypothesis 3

The third hypothesis, in the null form, is that expenditures for clothing by households with employed women do not vary with respect to the occupation of the employed woman.

Hypothesis 3 was tested on model 4 by calculating the derivative of Y_1 with respect to the dummy variables for occupation (D_9, D_{10}, and D_{11}). The derivatives indicate the difference in expenditures for clothing--per quarter, per family member-- between households with wives who were employed in Professional, Traditional and Uniformed occupations and households where the wife was not employed (the base category), ceteris paribus.

Chapter 5. Results

The focus of the empirical analysis was the estimation of the clothing expenditure models, equations 3 and 4. The initial probit and tobit analyses provided predicted values for the probabilities of wives' labor force participation (model 1) and estimated wage rates (model 2), respectively, for use in 3 and 4. Although not the focus of the analysis, the results of the analyses of models 1 and 2 are of interest since these results provide insight into how other household income and various sociodemographic variables affect the value of the wife's market and nonmarket time. Accordingly, the results of the initial probit and tobit analyses will be presented below and briefly discussed in the next chapter. The results of the estimations of models 3 and 4 will be presented below, and a detailed discussion of these results will appear in the next chapter.

The calculated derivatives from the tobit analyses, as well as the maximum likelihood coefficients obtained from the probit analysis, indicate the impact on the dependent variable of a change in a specific explanatory variable, *all else constant*. In order to avoid excessive repetition, the fact that a result is contingent on all else being held constant at the time the effect was calculated, is not mentioned in all cases below. It is, however, these *ceteris paribus* conditions that allow meaningful comparisons to be made--between "comparable" households--so it should be understood that they exist.

For ease of reference, a list of the variable names used in the tables of results and their abbreviated operational definitions appear in Table 2 on page 87. Complete operational definitions are in Chapter 4.

Estimation of Model 1: Prediction of Employment Status

Table 3 on page 88 contains the results of the estimation of model 1.

Family income, separate from that of the wife's employment-related income, had a significant negative impact on the wife's predicted probability of being employed. For every additional $1,000 of other family income, the probabiltiy of the wife being employed decreased by almost 2.5%, ceteris paribus.

The more highly educated the wife, the more likely she was to be employed. For an additional year of education, the probability of employment increased by 14%. When the race of the woman was white, she had a 38% higher chance of being employed, when compared to women who were of another race, all else equal.

The presence of infants and young children had a significant negative impact on the probability of the mother being employed. For households with an infant, the probability decreased by 60%; for those with a child 2-5 years old, it decreased by 44%; and for those with a child 6-12 years old, the probability decreased by 16%. This pattern of the decreasing effect as the children rose in age continued through to the children aged 13-15; this age group had no significant impact on the probability of the mothers being employed.

Women who resided in the Northeast and South were less likely to be employed--27% and 15% less, respectively--than were those women who lived in the North Central region of the

Table 2. Variable Names in Tables of Results

VARIABLE NAMES IN TABLES OF RESULTS	
VARIABLE	**DEFINITION**
CONSTANT	INTERCEPT
FINCWOW	OTHER HOUSEHOLD INCOME
TOTINF	NUMBER OF INFANTS < 2 YEARS OLD
KID1	NUMBER OF CHILDREN 2-5 YEARS OLD
KID2	NUMBER OF CHILDREN 6-12 YEARS OLD
KID3	NUMBER OF CHILDREN 13-15 YEARS OLD
GIRLS5	NUMBER OF GIRLS 2-5 YEARS OLD
GIRLS12	NUMBER OF GIRLS 6-12 YEARS OLD
GIRLS15	NUMBER OF GIRLS 13-15 YEARS OLD
BOYS5	NUMBER OF BOYS 2-5 YEARS OLD
BOYS12	NUMBER OF BOYS 6-12 YEARS OLD
BOYS15	NUMBER OF BOYS 13-15 YEARS OLD
AGE	WIFE'S AGE
EDUCA	WIFE'S EDUCATION
WORKEXP	WIFE'S WORK EXPERIENCE
ORACE	WIFE'S RACE
PROF	PROFESSIONAL OCCUPATION
TRAD	TRADITIONAL OCCUPATION
UNIF	UNIFORMED OCCUPATION
P_EMPLOY	PREDICTED PROBABILITY OF EMPLOYMENT STATUS
P_WAGE	PREDICTED ESTIMATED WAGE RATE
URBAN	URBAN/RURAL
NRTHEAST	NORTHEAST
SOUTH	SOUTH
WEST	WEST
FALL	FALL
WINTER	WINTER
SPRING	SPRING

Table 3. Predicted Probability of Wives' Employment Status (Model 1)

PROBIT ANALYSIS, LIMIT = 0.0 PSEUDO R^2 = .195
910 LIMIT OBSERVATIONS
1375 OBSERVATIONS AT ONE

VARIABLE	COEFFICIENT	STANDARD ERROR	T FOR HO PARAMETER = 0
CONSTANT	-.16560	.22984	-.72049
AGE	-.86468D-02	.54275D-02	-1.5932
EDUCA	.13785[c]	.13597D-01	10.138
FINCWOW	-.24154D-04[c]	.28926D-05	-8.3501
TOTINF	-.60333[c]	.58949D-01	-10.235
KID1	-.43703[c]	.47491D-01	-9.2024
KID2	-.16129[c]	.38730D-01	-4.1646
KID3	-.10515	.74102D-01	-1.4190
URBAN	.13791	.98903D-01	1.3944
ORACE	.37603[c]	.95570D-01	3.9345
NRTHEAST	-.26556[c]	.83867D-01	-3.1665
SOUTH	-.15373[b]	.78404D-01	-1.9607
WEST	.23017D-01	.87432D-01	.26326

a = Significant at α = .10.
b = Significant at α = .05.
c = Significant at α = .01.

country. The predicted probability of women in the West being employed was not significantly different from that of women who lived in the North Central region, all else equal.

The age of the woman and whether she resided in an urban or rural area had no significant impact on her predicted probability of employment.

The "Pseudo R^2"–which is assumed to be analogous to Ephron's R^2–for model 1 is .195, indicating that approximately 20% of wives' employment status was explained by the model. Cross sectional data typically yield low R^2s, so this result was not surprising.

Estimation of Model 2: Prediction of Wage Rates

Table 4 on page 90 contains the results of the estimation of model 2.

Since the predicted wage rates are proxies for the value of the wives' time, a decrease in the predicted wage rate indicates that at the time of the interview, the wife's time was becoming less valuable in the paid wage market. An increase indicates that her time was relatively more valuable in the market, all else equal.

Family income separate from the wife's employment-related income had a significant negative impact on the wife's predicted wage rate. For every additional $1,000 of other family income, the wife's predicted wage rate decreased by $0.04 an hour, all else equal.

The more educated the wife, the more valuable her time was in the market. For an additional year of education, her predicted wage rate increased by $0.45 an hour. When the wife's race was white, her predicted wage rate was approximately $1 higher than that of women of other races in the sample, ceteris paribus.

Table 4. Predicted Estimation of Wives' Wage Rates (Model 2)

TOBIT ANALYSIS, LIMIT = 0.0	CDF(Z) = .5498
996 LIMIT OBSERVATIONS	EPHRON'S R^2 = .104
1289 NON-LIMIT OBSERVATIONS	STANDARD ERROR OF ESTIMATE = 6.4887

VARIABLE	DERIVATIVE	NORMALIZED COEFFICIENT	STANDARD ERROR	T FOR HO PARAMETER = 0
CONSTANT	-2.5680	-.71982[c]	.17878	-4.0264
EDUCA	.45336	.12708[c]	.11107D-01	11.441
WORKEXP	-.01674	-.46916D-02	.45227D-02	-1.0373
FINCWOW	-.40463D-04	-.11342D-04[c]	.23875D-05	-4.7505
TOTINF	-1.6685	-.46771[c]	.50506D-01	-9.2604
KID1	-1.4194	-.39787[c]	.41047D-01	-9.6931
KID2	-.72073	-.20203[c]	.33401D-01	-6.0486
KID3	-.31917	-.89465D-01	.61776D-01	-1.4482
URBAN	.37643	.10551	.82556D-01	1.2781
ORACE	1.0091	.28286[c]	.73215D-01	3.8634
NRTHEAST	-.55464	-.15546[b]	.69524D-01	-2.2361
SOUTH	-.17360	-.48663D-01	.64169D-01	-.75837
WEST	.00172	.48301D-03	.70165D-01	.68839D-02

Note: Normalized Coefficient = B/σ,
where B = regression coefficient and σ = standard error of the estimate.
Note: Derivative = regression coefficient × CDF(Z),
where CDF(Z) = cumulative standard normal distribution function.
a = Significant at α = .10.
b = Significant at α = .05.
c = Significant at α = .01.

Infants and young children had a suppressing effect on predicted wage rates. For women with an infant, the predicted hourly wage rate decreased by $1.67; for women with a child 2-5 years old, it decreased by $1.42; for women with a child 6-12 years old, it decreased by $0.72. Children 13-15 years old had no significant impact on the relative value of their mother's time, all else equal.

Women residing in the Northeast had predicted hourly wage rates $0.55 less than those of women living in the North Central region. Women who were living in the South and West did not have predicted wage rates significantly different from those of comparable women living in the North Central region of the country.

The wife's work experience and whether she lived in an urban or rural area did not have a significant effect on her predicted wage rate.

Ephron's R^2 for model 2 is .104, indicating that over 10% of wives' wage rates was explained by the model.

Estimation of Clothing Expenditure Model 3

Clothing expenditure model 3 was estimated six times, once each for expenditures for household, women's, men's, girl's, boy's, and infant's clothing. The results from the estimation of household, women's, and men's expenditures will be discussed separately below. The children's categories--girl's, boy's, and infant's--will be discussed jointly at the end of this section.

Household Expenditures for Clothing

Table 5 on page 93 contains the results of the estimation of model 3 with household expenditures for clothing as the dependent variable.

Contrary to expectations, a change in the predicted probability of the wife's employment status did *not* have a significant impact on household expenditures for clothing. The wife's wage rate did have a significant (positive) effect, however. For every added dollar of wife's hourly wage rate, household expenditures for clothing increased $8.51 per quarter, per average family member.

Family income other than that contributed by the wife's employment-related income had a positive effect on household expenditures for clothing: for every additional $1,000 of other family income, household expenditures for clothing (per quarter, per average member) increased by $0.91.

The only significant age and sex categories of children were those of girls aged 13-15 and boys aged 2-5. For every girl 13-15 years old in the family, household expenditures for clothing increased by over $11 per quarter, per average member. For boys 2 to 5, the effect was negative: for every boy in this age group in the family, household expenditures for clothing decreased by $4.20 per quarter, per average member.

Households with wives whose race was white purchased $11.20 less clothing in a quarter, per average member, than did the households with wives of other races.

Families living in the Northeast and South spent significantly more money on clothing per quarter, per average member ($8.41 and $7.29, respectively), than did households in the North Central region. The expenditures for clothing by households in the West were not significantly

Table 5. Estimation of Household Expenditures for Clothing (Model 3)

TOBIT ANALYSIS, LIMIT = 0.0 CDF(Z) = .7977
162 LIMIT OBSERVATIONS EPHRON'S R^2 = .115
2123 NON-LIMIT OBSERVATIONS STANDARD ERROR OF ESTIMATE = 52.325

VARIABLE	DERIVATIVE	NORMALIZED COEFFICIENT	STANDARD ERROR	T FOR HO PARAMETER = 0
CONSTANT	2.21569	.53084D-01	.26445	.20073
FINCWOW	.000910	.21853D-04[c]	.29638D-05	7.3734
TOTINF	-1.37619	-.32970D-01	.62950D-01	-.52376
GIRLS5	-3.93673	-.94316D-01	.61755D-01	-1.5273
GIRLS12	-2.22239	-.53244D-01	.39209D-01	-1.3579
GIRLS15	11.0910	.26594[c]	.81007D-01	3.2829
BOYS5	-4.20125	-.10065[a]	.52245D-01	-1.9266
BOYS12	-2.46944	-.59162D-01	.40121D-01	-1.4746
BOYS15	-3.37212	-.80789D-01	.69268D-01	-1.1663
ORACE	-11.2005	-.26834[c]	.75877D-01	-3.5366
URBAN	.187990	.45038D-02	.77756D-01	.57923D-01
NRTHEAST	8.41175	.20153[c]	.69480D-01	2.9006
SOUTH	7.28747	.17459[c]	.62290D-01	2.8029
WEST	-1.17629	-.28181D-01	.65535D-01	-.43002
FALL	2.80766	.67265D-01	.59682D-01	1.1271
WINTER	9.83724	.23567[c]	.59200D-01	3.9810
SPRING	-2.54745	-.61033D-01	.60224D-01	-1.0134
P_EMPLOY	-24.1217	-.57792	.47074	-1.2277
P_WAGE	8.51944	.20411[c]	.45790D-01	4.4575

Note: Normalized Coefficient = B/σ,
where B = regression coefficient and σ = standard error of the estimate.
Note: Derivative = regression coefficient × CDF(Z),
where CDF(Z) = cumulative standard normal distribution function.
a = Significant at α = .10.
b = Significant at α = .05.
c = Significant at α = .01.

different from those in the North Central region. Household expenditures for clothing by urban families were not significantly different from those of rural families.

Household expenditures for clothing were significantly higher ($9.84 per average family member) during the winter quarter than during the summer quarter. Expenditures for clothing during the fall and spring quarters were not significantly different from those in the summer.

Ephron's R^2 for model 3, with household expenditures for clothing as the dependent variable, is .115; approximately 12% of household expenditures for clothing was explained by the model.

Expenditures for Women's Clothing

Table 6 on page 95 contains the results of the estimation of model 3 with expenditures for women's clothing as the dependent variable.

As was the case above, contrary to expectations, a change in the predicted probability of the wife's employment status did not significantly affect expenditures for women's clothing. The wife's wage rate had a positive effect; for every dollar increase in the wife's wage rate, expenditures on women's clothing increased almost $15.60 per quarter.

Other family income had a significant positive effect on expenditures for women's clothing. For every additional $1,000 of other family income, expenditures for women's clothing increased by $1.42 per quarter.

The number of girls 13-15 years old had a significant effect on expenditures for women's clothing. For each girl in this age group in the family, expenditures for women's clothing increased by almost $19 per quarter. Families with wives whose race was white spent approx-

Table 6. Estimation of Expenditures for Women's Clothing (Model 3)

TOBIT ANALYSIS, LIMIT = 0.0 CDF(Z) = .6162
597 LIMIT OBSERVATIONS EPHRON'S R^2 = .075
1688 NON-LIMIT OBSERVATIONS STANDARD ERROR OF ESTIMATE = 119.51

VARIABLE	DERIVATIVE	NORMALIZED COEFFICIENT	STANDARD ERROR	T FOR HO PARAMETER = 0
CONSTANT	-43.6917	-.59328[b]	.27591	-2.1503
FINCWOW	.001420	.19226D-04[c]	.30695D-05	6.2635
TOTINF	4.19330	.56940D-01	.65448D-01	.87000
GIRLS5	-1.96882	-.26734D-01	.64557D-01	-.41411
GIRLS12	-.21454	-.29132D-02	.40898D-01	-.71231D-01
GIRLS15	18.8403	.25583[c]	.83651D-01	3.0582
BOYS5	2.14438	.29118D-01	.54254D-01	.53670
BOYS12	-2.31010	-.31381D-01	.42058D-01	-.74614
BOYS15	-6.71658	-.91200D-01	.72763D-01	-1.2534
ORACE	-27.2268	-.36971[c]	.80371D-01	-4.6000
URBAN	5.78593	.78566D-01	.81795D-01	.96052
NRTHEAST	7.75303	.10528	.71983D-01	1.4626
SOUTH	10.3657	.14076[b]	.64295D-01	2.1892
WEST	-1.84065	-.24993D-01	.67935D-01	-.36790
FALL	-4.39862	-.59728D-01	.62230D-01	-.95979
WINTER	12.2359	.16615[c]	.61116D-01	2.7186
SPRING	-.618480	-.83984D-02	.62333D-01	-.13473
P_EMPLOY	-40.1393	-.54504	.48996	-1.1124
P_WAGE	15.5856	.21164[c]	.47307D-01	4.4736

Note: Normalized Coefficient = B/σ,
where B = regression coefficient and σ = standard error of the estimate.
Note: Derivative = regression coefficient × CDF(Z),
where CDF(Z) = cumulative standard normal distribution function.
a = Significant at α = .10.
b = Significant at α = .05.
c = Significant at α = .01.

imately $27 less per quarter on women's clothing than did comparable families with wives of other races.

The only region where expenditures differed significantly, when compared to the North Central region, was the South. Households in the South spent almost $10.50 more per quarter on women's clothing than did comparable households in the North Central region. Urban and rural households in the sample did not purchase significantly different dollar amounts of women's clothing.

Expenditures for women's clothing were higher in the winter than in the summer. Households spent on average over $12 more in the winter than in the summer for women's clothing. Expenditures for women's clothing during the fall and the spring were not significantly different from those in the summer.

Ephron's R^2 for this estimation of model 3 is .075; approximately 8% of expenditures for women's clothing was explained by the model.

Expenditures for Men's Clothing

Table 7 on page 97 contains the results of the estimation of model 3 with expenditures for men's clothing as the dependent variable.

The predicted probability of the wife's employment status had a significant impact on expenditures for men's clothing. A 10% increase in the predicted probability of the wife's employment status would have resulted in a $6.32 increase in quarterly expenditures for men's clothing, all else constant. However, the wife's predicted wage rate was not significant with respect to expenditures for men's clothing.

Table 7. Estimation of Expenditures for Men's Clothing (Model 3)

TOBIT ANALYSIS, LIMIT = 0.0 CDF(Z) = .4942
1008 LIMIT OBSERVATIONS EPHRON'S R^2 = .048
1277 NON-LIMIT OBSERVATIONS STANDARD ERROR OF ESTIMATE = 118.9

VARIABLE	DERIVATIVE	NORMALIZED COEFFICIENT	STANDARD ERROR	T FOR HO PARAMETER = 0
CONSTANT	-84.4242	-1.4367[c]	.29272	-4.9079
FINCWOW	.001360	.23177D-04[c]	.32562D-05	7.1176
TOTINF	7.83801	.13338[a]	.69240D-01	1.9264
GIRLS5	10.9228	.18588[c]	.67499D-01	2.7539
GIRLS12	-2.39885	-.40823D-01	.42851D-01	-.95268
GIRLS15	-4.52855	-.77066D-01	.90382D-01	-.85266
BOYS5	7.27808	.12386[b]	.57270D-01	2.1627
BOYS12	4.02872	.68560D-01	.43813D-01	1.5648
BOYS15	2.21243	.37650D-01	.77715D-01	.48447
ORACE	-17.4181	-.29641[c]	.84475D-01	-3.5089
URBAN	-2.54434	-.43299D-01	.85040D-01	-.50916
NRTHEAST	9.59094	.16321[b]	.75629D-01	2.1581
SOUTH	7.73621	.13166[a]	.67662D-01	1.9458
WEST	-5.28745	-.89977D-01	.71512D-01	-1.2582
FALL	1.38050	.23493D-01	.65438D-01	.35901
WINTER	18.6111	.31672[c]	.63656D-01	4.9754
SPRING	-2.69621	-.45883D-01	.66296D-01	-.69210
P_EMPLOY	63.2428	1.0762[b]	.51964	2.0711
P_WAGE	1.85849	.31627D-01	.50168D-01	.63042

Note: Normalized Coefficient = B/σ,
where B = regression coefficient and σ = standard error of the estimate.
Note: Derivative = regression coefficient × CDF(Z),
where CDF(Z) = cumulative standard normal distribution function.
a = Significant at α = .10.
b = Significant at α = .05.
c = Significant at α = .01.

The effect of other family income on expenditures for men's clothing was similar to that of the effect on expenditures for women's clothing: for every additional $1,000 of other family income, expenditures for men's clothing increased by $1.36 per quarter.

The presence of younger children had an impact on expenditures for men's clothing. Infants less than two years old, and girls and boys 2-5 years old had significant positive effects on expenditures for men's clothing. For each infant less than 2, households spent on average $7.84 more per quarter on men's clothing. For girls 2-5 and for boys 2-5, the increases were $10.92 and $7.28, respectively.

Households with wives whose race was white spent, on average, almost $17.50 less per quarter on men's clothing than did comparable households with wives of other races.

Families who lived in the Northeast and South spent significantly more on men's clothing than did comparable households in the North Central region ($9.59 and $7.74, per quarter, respectively). Expenditures for men's clothing by households in the West were not significantly different from those of households in the North Central region. Families in urban and rural areas did not have significantly different quarterly expenditures for men's clothing.

The only seasonal impact on expenditures for men's clothing was that of winter: on average, winter expenditures for men's clothing were almost $19 more than those in the summer.

Ephron's R^2 for model 3 with expenditures for men's clothing as the dependent variable is .048; approximately 5% of expenditures for men's clothing was explained by the model.

Expenditures for Children's Clothing

Table 8 on page 100, Table 9 on page 101, and Table 10 on page 102 contain the results of the estimations of model 3 when expenditures for girl's, boy's, and infant's clothing, respectively, were the dependent variables.

An increase in the predicted probability of the mother's employment status did not significantly affect quarterly expenditures for boy's or for infant's clothing. However, a 10% increase in the predicted probability of the mother's employment status would have resulted in a $2.66 decrease in quarterly expenditures for girl's clothing, ceteris paribus. The wage rate of the mother was significant in explaining expenditures for both girl's and boy's clothing. For every $1 increase in the mother's wage rate, expenditures for girl's clothing increased by $3.74. Expenditures for boy's clothing increased by $1.93 for every $1 increase in the mother's wage rate, all else equal. Expenditures for infant's clothing were not affected by the wage rate of the mother.

Other family income had a significant positive impact on expenditures for girl's and for boy's clothing. Expenditures for girl's clothing increased $0.34 per quarter for every additional $1,000 of family income separate from that earned by the mother; those for boy's increased by $0.19. Expenditures for infant's clothing were not affected by the family's other income.

The age and sex categories of children that appear in model 3 for estimation of the expenditures on girl's, boy's, and infant's clothing had the following effects: the more girls (boys, infants) in the family, the higher were the expenditures for the average girl (boy, infant). In contrast, the more children in the family who were not those for whom clothing expenditures were being estimated, e.g., the more boys and infants in the family when expenditures for girl's clothing were being estimated, the less the family spent on the category of expenditures

Table 8. Estimation of Expenditures for Girl's Clothing (Model 3)

TOBIT ANALYSIS, LIMIT = 0.0 — CDF(Z) = .2652
1449 LIMIT OBSERVATIONS — EPHRON'S R^2 = .035
836 NON-LIMIT OBSERVATIONS — STANDARD ERROR OF ESTIMATE = 97.624

VARIABLE	DERIVATIVE	NORMALIZED COEFFICIENT	STANDARD ERROR	T FOR HO PARAMETER = 0
CONSTANT	-23.4790	-.90688[c]	.33924	-2.6733
FINCWOW	.000340	.12970D-04[c]	.36344D-05	3.5687
TOTINF	-11.8364	-.45718[c]	.85403D-01	-5.3532
GIRLS5	19.2997	.74546[c]	.73166D-01	10.189
GIRLS12	19.7481	.76277[c]	.46237D-01	16.497
GIRLS15	26.2492	1.0139[c]	.87289D-01	11.615
BOYS5	-5.48168	-.21173[c]	.71240D-01	-2.9721
BOYS12	-3.62131	-.13987[c]	.52010D-01	-2.6894
BOYS15	-2.81536	-.10874	.85587D-01	-1.2705
ORACE	-4.85210	-.18741[a]	.10234	-1.8313
URBAN	1.09037	.42116D-01	.10405	.40478
NRTHEAST	-1.29945	-.50191D-01	.88791D-01	-.56527
SOUTH	2.11736	.81784D-01	.78920D-01	1.0363
WEST	1.36390	.52680D-01	.85199D-01	.61832
FALL	1.70139	.65716D-01	.75943D-01	.86534
WINTER	-1.29799	-.50135D-01	.76948D-01	-.65155
SPRING	-3.68310	-.14227[a]	.78477D-01	-1.8128
P_EMPLOY	-26.5890	-1.0270[a]	.59010	-1.7405
P_WAGE	3.74118	.14450[b]	.56496D-01	2.5578

Note: Normalized Coefficient = B/σ,
where B = regression coefficient and σ = standard error of the estimate.
Note: Derivative = regression coefficient × CDF(Z),
where CDF(Z) = cumulative standard normal distribution function.
a = Significant at α = .10.
b = Significant at α = .05.
c = Significant at α = .01.

Table 9. Estimation of Expenditures for Boy's Clothing (Model 3)

TOBIT ANALYSIS, LIMIT = 0.0	CDF(Z) = .3262
1389 LIMIT OBSERVATIONS	EPHRON'S R^2 = .038
896 NON-LIMIT OBSERVATIONS	STANDARD ERROR OF ESTIMATE = 62.229

VARIABLE	DERIVATIVE	NORMALIZED COEFFICIENT	STANDARD ERROR	T FOR HO PARAMETER = 0
CONSTANT	-18.3543	-.90419[c]	.32357	-2.7944
FINCWOW	.000190	.92663D-05[c]	.35906D-05	2.5807
TOTINF	-7.94558	-.39143[c]	.80055D-01	-4.8895
GIRLS5	-4.42588	-.21803[c]	.82141D-01	-2.6543
GIRLS12	-2.74138	-.13505[c]	.49272D-01	-2.7409
GIRLS15	-3.93887	-.19405[b]	.98602D-01	-1.9680
BOYS5	15.2213	.70058[c]	.61780D-01	11.340
BOYS12	13.4636	.66326[c]	.45842D-01	14.468
BOYS15	15.0349	.74067[c]	.74456D-01	9.9476
ORACE	-3.85797	-.19006[b]	.95934D-01	-1.9812
URBAN	-1.21382	-.59796D-01	.92750D-01	-.64470
NRTHEAST	1.88563	.92892D-01	.86623D-01	1.0724
SOUTH	1.69656	.83579D-01	.76533D-01	1.0921
WEST	-1.70104	-.83799D-01	.83138D-01	-1.0079
FALL	4.53646	.22349[c]	.72841D-01	3.0682
WINTER	.032260	.15891D-02	.73714D-01	.21558D-01
SPRING	-2.98222	-.14691[a]	.76079D-01	-1.9311
P_EMPLOY	-8.10998	-.39952	.57228	-.69813
P_WAGE	1.93290	.95221D-01[a]	.55704D-01	1.7094

Note: Normalized Coefficient = B/σ,
where B = regression coefficient and σ = standard error of the estimate.
Note: Derivative = regression coefficient × CDF(Z),
where CDF(Z) = cumulative standard normal distribution function.
a = Significant at α = .10.
b = Significant at α = .05.
c = Significant at α = .01.

Table 10. Estimation of Expenditures for Infant's Clothing (Model 3)

TOBIT ANALYSIS, LIMIT = 0.0 — CDF(Z) = .1315
1728 LIMIT OBSERVATIONS — EPHRON'S R^2 = .085
557 NON-LIMIT OBSERVATIONS — STANDARD ERROR OF ESTIMATE = 82.399

VARIABLE	DERIVATIVE	NORMALIZED COEFFICIENT	STANDARD ERROR	T FOR HO PARAMETER = 0
CONSTANT	-21.6357	-1.9967[c]	.42698	-4.6765
FINCWOW	.687074D-04	.63410D-05	.49148D-05	1.2902
TOTINF	14.1639	1.3071[c]	.98911D-01	13.215
GIRLS5	-1.01377	-.93561D-01	.94896D-01	-.98593
GIRLS12	-4.52426	-.41754[c]	.81601D-01	-5.1168
GIRLS15	-4.59198	-.42379[b]	.21619	-1.9603
BOYS5	-.753140	-.69507D-01	.81350D-01	-.85442
BOYS12	-3.32340	-.30671[c]	.79093D-01	-3.8779
BOYS15	-3.54419	-.32708[a]	.16743	-1.9535
ORACE	-.362151	-.33423D-01	.10855	-.30790
URBAN	-1.02290	-.94402D-01	.12491	-.75574
NRTHEAST	2.52362	.23291[b]	.10753	2.1659
SOUTH	2.66472	.24593[b]	.95541D-01	2.5741
WEST	2.75453	.25421[c]	.95398D-01	2.6648
FALL	.242894	.22417D-01	.90255D-01	.24837
WINTER	.938726	.86634D-01	.88332D-01	.98077
SPRING	-.052664	-.48604D-02	.90785D-01	-.53537D-01
P_EMPLOY	7.75206	.71543	.77126	.92761
P_WAGE	-.158116	-.14593D-01	.77519D-01	-.18825

Note: Normalized Coefficient = B/σ,
where B = regression coefficient and σ = standard error of the estimate.
Note: Derivative = regression coefficient × CDF(Z),
where CDF(Z) = cumulative standard normal distribution function.
a = Significant at α = .10.
b = Significant at α = .05.
c = Significant at α = .01.

being estimated. This damping effect by numbers of other children was in evidence in each estimation of the expenditures for children's clothing (for categories that were significant).

Quarterly expenditures for girl's and for boy's clothing were significantly less in households where the race of the mother was white as compared to comparable households where the mother was of another race, $4.85 less for girl's and $3.86 less for boy's. Expenditures for infant's clothing were not affected by the mother's race.

The region of the country in which the family resided did not have a significant effect on expenditures for girl's nor for boy's clothing. Households in the Northeast, South and West spent significantly more per quarter on infant's clothing when compared to comparable households in the North Central region ($2.52, $2.66, and $2.75 more, respectively). Whether the households were urban or rural had no significant impact on expenditures for girl's, for boy's, or for infant's clothing.

Expenditures for girl's clothing were $3.68 lower in the spring than in the summer, all else constant. Expenditures for girl's clothing in the fall and winter quarters were not significantly different from those in the summer. Expenditures for boy's clothing were over $4.50 higher in the fall, and almost $3 less in the spring than in the summer. Expenditures for infant's clothing were unaffected by season, ceteris paribus.

Ephron's R^2 for the estimations of model 3 with expenditures for girl's, boy's, and infant's clothing are .035, .038, and .085, respectively. These results indicate that approximately 4% of girl's, 4% of boy's, and 9% of infant's clothing expenditures were explained by the respective estimations of model 3.

Estimation of Clothing Expenditure Model 4

Table 11 on page 105 contains the results of the estimation of model 4.

Model 4 was estimated once, with household expenditures for clothing as the dependent variable. When model 3 was estimated using household expenditures as the dependent variable, wives' employment was represented by the predicted probability of employment obtained from the probit analysis. In model 4, wives' employment is represented by three dummy variables for the occupational categories: Professional, Traditional, and Uniformed. Comparisons can be made between each occupational category and the nonemployed wives category, the base category.

The occupational variables were significant and positive in their effects. Households with women employed in Professional occupations, as defined here, spent almost $24 more per quarter, per average member, for clothing than did comparable households with nonemployed wives. Households with women employed in Traditional or in Uniformed occupations spent over $5 more on clothing per quarter, per average member than did households with women who were not employed, all else equal. The predicted wage rate of the wife also had a positive effect on household expenditures for clothing: for every $1 increase in the wife's predicted wage rate, household expenditures increased $5.20 per quarter, per average family member.

Other family income had a positive and significant impact on household expenditures for clothing. For each additional $1,000 of family income separate from that earned by the wife, household expenditures for clothing increased by $1 per quarter, per average family member.

The only age and sex categories of children that had an effect on household expenditures for clothing were those of girls aged 13-15 and boys aged 2-5. Each additional girl 13-15 years old increased household expenditures for clothing by almost $12 per quarter, per average

Table 11. Estimation of Household Expenditures for Clothing (Model 4)

TOBIT ANALYSIS, LIMIT = 0.0 — CDF(Z) = .7998
162 LIMIT OBSERVATIONS — EPHRON'S R^2 = .13
2123 NON-LIMIT OBSERVATIONS — STANDARD ERROR OF ESTIMATE = 51.854

VARIABLE	DERIVATIVE	NORMALIZED COEFFICIENT	STANDARD ERROR	T FOR HO PARAMETER = 0
CONSTANT	-9.55281	-.23034[a]	.13847	-1.6635
FINCWOW	.996951D-03	.24040D-04[c]	.21888D-05	10.983
TOTINF	.598858	.14440D-01	.50898D-01	.28370
GIRLS5	-2.01838	-.48667D-01	.57729D-01	-.84303
GIRLS12	-1.82394	-.43980D-01	.39144D-01	-1.1235
GIRLS15	11.8466	.28565[c]	.79820D-01	3.5787
BOYS5	-3.27030	-.78855D-01[a]	.47824D-01	-1.6489
BOYS12	-2.07844	-.50116D-01	.39914D-01	-1.2556
BOYS15	-3.24623	-.78275D-01	.68627D-01	-1.1406
ORACE	-10.5918	-.25539[c]	.75106D-01	-3.4003
URBAN	-.671800	-.16199D-01	.77359D-01	-.20940
NRTHEAST	10.1495	.24474[c]	.64502D-01	3.7943
SOUTH	8.13237	.19610[c]	.59730D-01	3.2831
WEST	-1.09813	-.26479D-01	.65547D-01	-.40396
FALL	2.91103	.70192D-01	.59700D-01	1.1757
WINTER	10.0303	.24186[c]	.59220D-01	4.0840
SPRING	-2.49386	-.60132D-01	.60240D-01	-.99820
PROF	23.8668	.57548[c]	.87338D-01	6.5891
TRAD	5.01499	.12092[b]	.52460D-01	2.3051
UNIF	5.03106	.12131[a]	.62884D-01	1.9291
P_WAGE	5.20286	.12545[c]	.21014D-01	5.9701

Note: Normalized Coefficient = B/σ,
where B = regression coefficient and σ = standard error of the estimate.
Note: Derivative = regression coefficient × CDF(Z),
where CDF(Z) = cumulative standard normal distribution function.
a = Significant at α = .10.
b = Significant at α = .05.
c = Significant at α = .01.

member, all else equal. Household expenditures for clothing decreased by $3.27 per quarter, per average member for each additional boy 2-5 years old in the family.

Households in which the race of the wife was white spend over $10.50 less per quarter, per average member, than comparable households with wives of other races.

Household expenditures for clothing were higher for households in the Northeast and in the South ($10.15 and $8.13, respectively) than for those in the North Central region of the country. Household expenditures for clothing by households in the West were not significantly different from those in the North Central region, ceteris paribus. Families residing in urban areas did not have expenditures for clothing that were significantly different from comparable households in rural areas.

Winter expenditures for household clothing were over $10 higher than were those in the summer, all else equal. Fall and spring expenditures were not significantly different from those in the summer.

Ephron's R^2 for model 4 is .13; 13% of household expenditures for clothing was explained by model 4.

Chapter 6. Discussion and Conclusions

The results of the initial probit and tobit analyses of models 1 and 2, respectively, will be jointly discussed below. Since the focus of the empirical analysis was the estimation of clothing expenditure models 3 and 4, a more detailed discussion of the results of the tobit analyses of models 3 and 4 will follow.

Estimation of Models 1 and 2

Models 1 and 2, those used to obtain predicted probabilities of wives' labor force participation and predicted wage rates, respectively, differ in only one of the right-hand side variables. The other explanatory variables are the same since it was assumed that the same variables affected the wives' nonmarket and market productivity, thus affecting her decision to enter the labor market as well as her wage rate. Model 1 contains the wife's age as an explanatory variable for employment status, while model 2 contains years of wife's experience--instead of age--as an explanatory variable for wage rate. The results obtained from the estimations of models 1 and 2 are as anticipated except for the coefficients on the age and work experi-

ence variables. Neither of these variables had a significant impact on the dependent variables in either model.

Family income separate from the wife's employment-related income had a supressing (negative) effect on both the predicted probability of employment and the predicted wage rate, as was anticipated. Apparently, the higher other household income was, the more valuable the woman's time was at home, ceteris paribus. The predicted probability of the wife being employed and her predicted wage rate also were negatively affected by the presence of infants and young children in the family. As the ages of the children increased, the negative effects lessened; children 13-15 years old had no significant effect on their mothers' predicted probability of employment or her predicted wage rate. The wife's time appears to have been more valuable to the family if she worked at home without pay during the years in which the children were youngest.

The more highly educated the wife, the more likely she was to be employed and the higher her predicted wage rate, as expected. All else equal, a more highly educated woman's time was more valuable when engaged in market production.

The urban/rural, race, and regional variables were included to control for prices. Women whose race was white had higher predicted probabilities of employment and higher predicted wage rates than did women of other races, ceteris paribus. Whether the household was located in an urban or rural area was not a significant determinant of predicted probability of employment status nor of predicted wage rate, but area of the country was. Women residing in the Northeast and South were less likely to be employed, and women living in the Northeast had lower predicted wage rates than did women in the North Central region, all else equal.

In summary, other family income, ages and numbers of children, education, race, and region of the country, had significant impacts on the wife's relative productive value to the family. The higher other family income and the more young children in the family, the more valuable the

wife's time was at home and the more likely she was to be working at home instead of in the paid labor market. The more highly educated the woman, the more valuable her time was outside of the home, all else equal. The negative impact of being of a race other than white, or of living in the Northeast (or South, in the case of employment status) is thought to have resulted from price variations.

Estimation of Clothing Expenditure Model 3

The following discussion of the results of the six estimations of Model 3--for household, women's, men's, girl's, boy's, and infant's expenditures for clothing--is organized around the explanatory variables. Since the explanatory variables are common to each estimation of the model, organizing the discussion in this manner may provide insight into the clothing expenditure behavior of the family as an integrated group, instead of either the isolated cases of expenditures for each member, or the aggregate behavior of the household into which family members are incorporated but not observed.

The predicted probability of the wife's employment had a significant positive impact on expenditures for men's clothing. A 10% increase in the predicted probability that the wife participated in the paid labor market would have resulted in a $6.32 increase in quarterly expenditures for men's clothing, all else equal. However, contrary to expectations, the predicted probability of the wife's employment status was not significant in explaining expenditures for household, women's, boy's, or infant's clothing. Also surprising was that expenditures for girl's clothing were negatively impacted by an increased probability of the mother being employed. A 10% increase in the predicted probability of the mother being employed would have resulted in a $2.66 decrease in quarterly expenditures for girl's clothing.

With the exception of the results of the estimation of Model 3 for expenditures for men's clothing, these results are not as anticipated. It was expected that an increase in the predicted probability of the wife's participation in the labor force would not only increase household expenditures for clothing, but would positively affect expenditures for each member of the family.

The nonsignificance of the predicted probability of the wife's employment status in the estimation of household, women's, boy's, and infant's clothing may be the result of using *predicted probabilities* of employment status instead of true employment status. The use of the predicted values solved the potential problem of correlation between the error terms of the endogenous variables, but these predicted probabilities do not have exactly the same meaning as true employment status. Therefore, the estimates do not reflect the *actual* effect of the wife's participation in the labor force. These estimates may be more akin to an income/wage effect than an employment effect. Equation 1 may model the "employability" of the wife.

Another possible explanation is that comparisons between households with employed wives and households with nonemployed wives *all else equal* may be unrealistic. Perhaps these families are not truly comparable; they may be in different social, or expenditure, classes, and there may be very different expectations or preferences with regard to how household income is spent and why.

In addition, the data are in the form of dollars of expenditures; nothing can be inferred about numbers of items purchased. Also, it may be the case that the employed-wife households purchased more clothing-related services than did the nonemployed-wife households in the sample, perhaps reducing the need for large inventories of, or expenditures on, clothing. The CES data do not provide information on purchases of clothing-related services other than Coin or Noncoin Laundry and Drycleaning expenditures. Since coin services do not necessarily imply self-service, and noncoin services do not necessarily imply purchased service, these data were not useful here. (Many coin laundromats provide "wash/dry/fold" services. Others

provide self-service washing, drying, and drycleaning machines that take plastic tickets instead of coins.) The CES data do not indicate if in-home services were purchased, either for housekeeping or for laundry services. It may also be the case that an aggregate "employed" category (whether predicted or actual) hides--or averages out--the underlying differences in the tastes and preferences, as well as in the employment-related wardrobe needs, of women employed in various occupations.

The negative impact of the woman's predicted probability of employment on expenditures for girl's clothing is puzzling. Expenditures for girl's clothing were significantly less as the predicted probability of the mother being employed increased, all else equal. Again, this result could be additional evidence of the fact that there may be subtle differences between the households with comparable income and sociodemographic characteristics, one with an employed wife and one with a nonemployed wife.

Another potential problem with the estimation of expenditures for girl's clothing could be that daughters of working mothers are more likely to wear their mothers' clothing if the mother has an employment-related wardrobe. The sample was limited to families with children under 16 years old in an attempt to avoid confusion over for whom--the older teenaged girl or the mother-- "women's clothing" had been purchased. It may be, however, that clothing was purchased for one or the other and then shared, resulting in decreased expenditures for either or both the mother and the daughter. Since the expenditure data for the children are expenditures for the *average* child in an age/sex category, the estimations of model 3 for these expenditure categories may provide less information about specific children (e.g., teenaged girls) than is desired.

The positive impact of an increase in the predicted probability of the wife being employed on expenditures for men's clothing is in line with expectations. Employed wives may utilize increased inventories of men's clothing to assure that clothing maintenance activities (washing,

drying, ironing, trips to the dry cleaners, etc.) would not need to be carried out during relatively high-cost weekday hours.

The wife's predicted wage rate had positive and significant effects on expenditures for household, women's, girl's, and boy's clothing. The impact on expenditures for the woman's own clothing was far greater than on expenditures for household, girl's, or boy's clothing. For every additional dollar of predicted hourly wage rate, the expenditures for women's clothing increased almost $15.60 per quarter. For a woman whose time was valued at $4 over minimum wage, this increase would have resulted in annual expenditures for women's clothing of approximately $250 more than would have resulted for women earning minimum wage. Although the wife's predicted wage rate had a positive effect on expenditures for girl's and boy's clothing, it did not affect those for infants. There may be fixed costs in clothing infants that all families must bear, whether the mother is employed or not and whatever the value of her time. Another, or additional, explanation could be that many items of clothing for infants are "handed down" through the family or among friends and neighbors. Some families also may receive a significant portion of infants' wear as gifts, or they may choose to purchase secondhand infants' clothing at garage sales or informally from friends and neighbors since infants often outgrow their clothing before it is worn out.

Clothing expenditures for older children of both sexes may be affected by peer group pressure and/or fashion so that, as the mother's earning power rises, she may be willing to augment her children's clothing stocks beyond those which would be purchased if her wage rate were low. There is also an income effect involved here, as there is with expenditures for household and for women's clothing; the greater the mother's earning power, the higher the family's total income may be. Since clothing is a normal good, as income increases, so do expenditures for clothing.

Family income separate from that of the wife's employment-related income had a significant positive effect on all clothing expenditure categories except that of infant's. Again, it may be

the case that there are fixed costs in clothing infants which are not associated with family income, or that items of infant's clothing were received as gifts, handed down, or purchased in the secondhand market.

The presence of teenaged girls 13-15 years old significantly increased expenditures for household and women's clothing. The increases in household expenditures were expected, but the effect on expenditures for women's clothing may be further evidence that some purchases of women's clothing were intended for the 13-15 year old girls. Household clothing expenditures decreased when the family included 2-5 year old boys, but expenditures for men's clothing were positively affected by the presence of infants, and by both girls and boys 2-5 years old. These increased expenditures for men's clothing associated with the presence of young children may indicate that men with young children are likely to be young themselves, just starting their careers and increasing their wardrobes.

The age/sex categories of children used as explanatory variables in the estimations of the children's clothing expenditures were as expected: the more girls (boys, infants) in the family, the higher the expenditures for girl's (boy's, infant's) clothing. The more children in the family who were not those for whom clothing expenditures were being estimated, e.g., the more boys and infants in the family when expenditures for girls were being estimated, the less the family spent on the category of expenditures being estimated (i.e.,girl's). These results were anticipated since, all else constant, the more children the family has the less money it has to spend on each.

The race, urban/rural, region, and season variables were included in the model as control--ceteris paribus--variables. In all cases, if the race of the wife was white, expenditures for clothing were less than in comparable households with wives of other races. This result has been observed in other clothing expenditure studies and the explanation often provided is that nonwhites may engage in compensatory consumption (Dardis et al, 1981) with regard to expenditures for clothing and other durables.

The nonsignificance of the urban/rural variable is surprising since other researchers have found the clothing expenditures of urban households to exceed those of rural households (Dardis et al, 1981; Lee & Phillips, 1971). The impact of region (which included only urban households) indicates that household and men's expenditures were higher in the Northeast and South than in the North Central region. Expenditures for women's clothing were also higher in the South than in the North Central region, but they were not significantly different in the Northeast and the North Central regions. Expenditures for household, women's, and men's clothing by households in the West were not significantly different from those of comparable households in the North Central part of the country. Expenditures for girl's and boy's clothing were not affected by region of the country, but expenditures for infant's clothing were significantly higher in households in the Northeast, South, and West than in the North Central region. Erickson (1968) found that households in the Northeast had the highest expenditures for clothing while those in the South had the lowest. Erickson hypothesized that clothing expenditures were positively correlated with the per capita incomes in a region. Erickson's data were collected in 1960-61. Subsequently, areas of the South have seen substantial improvements in economic development which may be in evidence from the overall results here, since expenditures for household, women's, men's, and infant's clothing were higher in the South than in the West, ceteris paribus.

Expenditures for household, women's, and men's clothing were significantly higher in the winter than in the summer. Since the data employed here are dollars of expenditure, and winter clothing is usually more expensive than that for other seasons, especially for summer clothing, these results are reasonable. Expenditures for infant's clothing were unaffected by season, but for girl's they were lower in the spring than in the summer, and for boy's they were lower in the spring but higher in the fall. Expenditures for school children's clothing would be expected to increase in the fall, as they did for the boys in the sample (over summer expenditures). However, expenditures for both girl's and boy's clothing were less in the

spring than in the summer, so either more was being spent on summer clothing, or clothing for school was being purchased in the summer months before school began.

Estimation of Clothing Expenditure Model 4

The results of the estimation of model 4 are very similar to those of model 3 when household expenditures for clothing were the dependent variable. The derivatives with respect to the variables common to both models are of similar magnitude, significant to the same degree, and in the same direction. The derivatives with respect to the variables that appear in both models will be briefly discussed first. Since model 4 was estimated in order to discover the impact of wives' occupation on household expenditures for clothing--as opposed to the impact of wives' employment status, as in model 3--the discussion of the results of this estimation will focus on the occupation coefficients.

As was the case with model 3, the predicted wage rate of the wife had a positive effect on household expenditures for clothing. For every dollar increase in the wife's hourly wage, household expenditures for clothing per quarter, per average family member increased by $5.20. Family income separate from that earned by the wife had a positive impact as well; for every additional $1,000 of other family income, household expenditures for clothing increased by $1 per quarter, per average family member.

As also occurred with model 3, girls 13-15 years old had a significant positive effect on household expenditures for clothing, while the presence of boys 2-5 years old had a negative impact. The presence of children in other categories did not have a significant impact on household expenditures for clothing. In households where the race of the wife was white, household expenditures for clothing were over $10.50 less per quarter, per average family member than in comparable households with women of other races.

Whether the household was located in an urban or a rural area was not significant, but the region of the country was. Families in the Northeast and South spent significantly more on household clothing than did comparable families in the North Central region, while those in the West did not have household expenditures for clothing that were significantly different from those of North Central families. As with model 3, household expenditures for clothing were significantly higher in the winter than in the summer (over $10 more per average family member). Household expenditures for clothing in the fall and spring were not significantly different from those in the summer.

In contrast to the insignificance of the predicted probability of the wife's employment status when model 3 was estimated with household expenditures for clothing as the dependent variable, all the occupation variables in model 4 had a significant and positive impact on household expenditures for clothing. Households with women employed in professional occupations spent almost $24 more per quarter, per average family member on clothing than did households with nonemployed wives. Households with wives employed in traditional and uniformed occupations spent over $5 more per quarter, per average family member.

The estimation of model 4 indicates that households with employed women *do* exhibit higher expenditures for clothing than do households with nonemployed wives, ceteris paribus. As was discussed above, the unexpected insignificance of the predicted probability of the wives' employment status in the estimation of model 3, with household clothing expenditures as the dependent variable, may have been due to using predicted probabilities of employment versus true employment status. Also discussed was the question of whether it was reasonable to compare households in which the husband was the sole earner with those in which both spouses contributed income. It was suggested that such households may not be comparable because of different expectations or preferences with regard to how household income is spent and why. Model 4 may come closer to capturing the effects of these different expectations or tastes. By including the wife's occupational category, there is some accounting for

differences in social, or expenditure, class. Research that includes men's occupation as an explanatory variable often does so to account for just such differences between groups.

The results of the estimation of model 4 may indicate that inventories of household clothing do increase when wives enter the paid labor force. Such an increase would be rational in light of the additional constraints on employed women's time and the relatively high cost of their time during weekday hours. Larger inventories of clothing might allow employed women to accumulate clothing maintenance tasks until the relatively low-cost weekend hours.

In conclusion, null Hypothesis 1 was not rejected. The test of null Hypothesis 1--that households with employed women do not exhibit higher levels of expenditures for clothing than do households with women who are homemakers, ceteris paribus--was performed on clothing expenditure model 3 when estimated with household expenditures for clothing as the dependent variable.

The test of null Hypothesis 2 was performed on clothing expenditure model 3 when estimated with expenditures for women's, men's, girl's, boy's, and infant's clothing as the dependent variables, even though, as stated, it was contingent on rejection of null Hypothesis 1. Null Hypothesis 2--that, all else equal, if households with employed women do exhibit higher levels of expenditures for clothing than do households with women who are homemakers, then these higher levels are not attributable to higher levels of expenditures for clothing by members of the household other than the employed wife--was not rejected except in the estimation of model 3 when expenditures for men's clothing was the dependent variable.

Null Hypothesis 3 was rejected. The test of null Hypothesis 3--that expenditures for clothing by households with employed women do not vary with respect to the occupation of the employed women--was performed on clothing expenditure model 4.

The unexpected results from the estimations of model 3 for all but expenditures for men's clothing may model the household's true clothing expenditure behavior in response to the wife's employment, or there may be some important elements missing from the analysis. As discussed above, the use of the predicted values for the wife's employment status may have introduced another type of income effect, but it may not have represented the *true* impact of the wife's employment commitment. The ability to make statements about "comparable" households is also in question, due to possible differences in expectations or preferences in employed-wife and nonemployed-wife families when income is controlled.

The effect of employment status on household expenditures for clothing is perhaps strongest *at the time* the woman becomes employed, when stocks of clothing for all members of the household may increase substantially over a short period. The initial period's clothing stocks may be subject only to periodic replacement. Since the data do not allow analysis of the utilization of clothing-related services, it is impossible to tell if the purchase of services--the purchase of labor instead of capital stocks--was used to help employed married women manage the increased constraints on their time.

There is also the possibility that, in response to additional time constraints, the employed women chose to shop less and also may have decreased the "quality" as well as the frequency of clothing maintenance activities, resulting in clothing inventory needs that were not significantly different from those of nonemployed women, all else equal. A major difficulty in drawing conclusions from the data employed here is the fact that quantity is unaccounted for; only conjectures about numbers of items purchased can be made.

The results from the estimation of clothing expenditure model 4 are as expected. Women's occupation had a significant positive impact on household expenditures for clothing, and the impact was not the same for all occupations. The greater expenditures for clothing in households with women employed in professional occupations may have included increased purchases of employment-related clothing for the wife. However, even the households with women employed in uniformed occupations had significantly larger clothing expenditures when compared to comparable households with nonemployed women. It may be the case that the wife's employment requires disaggregation by occupation in order to determine the impact of her paid labor employment on household expenditures for clothing. To ascertain if the effect is due to a household production phenomenon, i.e., expenditures increase in response to the wife's attempts to schedule clothing maintenance activities during low-cost weekend hours, model 4 would need to be estimated with expenditures for individual family member's clothing as separate dependent variables.

Chapter 7. Implications for Future Research

Further investigation into household clothing expenditure behavior should be undertaken with a model such as model 4--with wives' employment disaggregated by occupation-- using expenditures for women's, men's, girl's, boy's, and infant's clothing as separate dependent variables. Such a specification may provide more information about household clothing consumption behavior than did the estimations of model 3. Model 3 did estimate disaggregated household expenditures, but the wife's employment was represented by her predicted probability of employment. The use of a true indicator of the wife's employment--such as occupation--instead of a predicted indicator may produce different results, especially for the estimation of expenditures for women's clothing. In addition, a measure of the wife's time commitment to the paid labor force--either as a continuous variable or as a variable representing full- or part- time employment--needs to be included in the model.

It also may prove beneficial to include the wife's age (or work experience) and education in the clothing expenditure model. Here these variables were used in the models only to obtain the predicted probabilities of employment and predicted wage rates. These variables may be influential in expenditure decisions as well. It also would be useful to control for social or expenditure class of the households in the sample. The inclusion of the husband's occupation or a homeownership variable might serve this purpose.

Additional clothing expenditure studies that employ tobit analysis need to be undertaken. With more use, and published results, there will be increased understanding as to how to effectively model the relationship between women's employment and expenditures for clothing, resulting in better fit of the models to the data and in more conclusive results.

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