AN ABSTRACT OF THE THESIS OF

<u>CHANDRA KALA BHADRA</u>   for the degree <u>MASTER OF SCIENCE</u>

in <u>FAMILY RESOURCE MANAGEMENT</u> presented on <u>May 4, 1981</u>

TITLE: <u>USE OF TIME FOR PHYSICAL AND NONPHYSICAL CARE OF</u>

 <u>FAMILY MEMBERS: AN ANALYSIS IN TWO-PARENT,</u>

 <u>TWO-CHILD OREGON HOUSEHOLDS</u>

Abstract approved: <u>　　Redacted for privacy　　</u>
<div align="right">Virginia H. Dickinson</div>

The purpose of this study was to analyze the use of
time for physical and nonphysical care of family members
in two-parent, two-child, rural and urban Oregon families.
The relationships of the amount of time spent for physical
and nonphysical care of family members to the independent
variables, age of youngest child, age of oldest child,
age of homemaker, age of spouse, education of homemaker,
education of spouse, occupation of homemaker, occupation
of spouse, hours employed by homemaker, hours employed by
spouse, family income, and family residence (urban/rural)
were investigated using correlation and regression analyses.

The data used in the analysis had been collected from
210 two-parent, two-child Oregon families between January
and December 1977 as part of Interstate Urban/Rural Com-
parison of Families' Time Use; a contributing project of
the Northeast Regional Research Project NE-113. Families
from rural areas lived in Linn and Benton counties.

Families from urban areas lived in the Portland Standard Metropolitan Statistical Area. The 105 families sampled from each area (urban/rural) were stratified into five groups according to the age of youngest child. There were 21 families in each stratum. Since the sample was stratified and the sample observations were not proportional to the population, weights were used for respective strata to make a true estimate of the population mean.

The mean age for homemakers was 33 years ranging from 18 years to 54 years. For the spouse, the mean age was 35 years ranging from 20 years to 54 years. The education level completed by both the homemakers and the spouses was higher than the national average. More than two-thirds of the homemakers were fulltime homemakers. Ninety eight percent of the spouses were employed. Both the employed homemakers and the employed spouses were in white collar occupations at a higher percentage than the national average. The families were largely representative of middle and higher income groups.

The mean amount of total time spent for care of family members was 2.97 hours per day. Of this, 2.27 hours was attributed to the homemaker and .7 hours could be attributed to the spouse. The mean amount of time spent for physical care was 1.47 hours per day. The mean amount of time spent for nonphysical care was 1.50 hours per day.

The age of youngest child and the age of oldest child were found to have significant negative relationships to the amount of time spent for care of family members. As the ages of the youngest child and the oldest child increased, the amount of time spent for care of family members decreased.

The age of homemaker was found to have significant positive relationships to both physical and nonphysical care of family members by the homemaker. As the age of the homemakers increased, the time spent for both physical and nonphysical care of family members by the homemakers increased.

The significant negative relationship of hours employed by the homemaker to her time for nonphysical care indicated that homemakers tend to decrease their time for nonphysical care of family members as the hours of employment (for homemakers) increase.

Occupation of homemaker was found to have a significant relationship to her time for nonphysical care. The fulltime homemakers tend to spend more time for nonphysical care of family members than the homemakers who are engaged in other occupations.

The area of family residence was significantly related to the amount of time spent for physical care by both the homemaker and the spouse. Urban couples were found to spend more time for physical care of family members than the rural couples.

USE OF TIME FOR PHYSICAL AND NONPHYSICAL CARE OF
FAMILY MEMBERS: AN ANALYSIS IN TWO-PARENT,
TWO-CHILD OREGON HOUSEHOLDS

by

Chandra Kala Bhadra

A THESIS

submitted to

Oregon State University

in partial fulfillment of
the requirements for the
degree of

Master of Science

Completed May 4, 1981

Commencement June, 1981

APPROVED:

Redacted for privacy
Assistant Professor of Family Resource Management
in charge of major

Redacted for privacy
Head of Department of Family Resource Management

Redacted for privacy

Dean of Graduate School

Date thesis is presented   May 4, 1981

Typed by Chandra Kala Bhadra for Chandra Kala Bhadra

ACKNOWLEDGEMENTS

TABLE OF CONTENTS

LIST OF TABLES

USE OF TIME FOR PHYSICAL AND NONPHYSICAL CARE OF FAMILY MEMBERS: AN ANALYSIS IN TWO-PARENT, TWO-CHILD OREGON HOUSEHOLDS

I. INTRODUCTION

It has long been recognized that the unpaid household production which provides food, clothing, shelter, and care for family members is of major importance to the social and economic welfare of a nation (Walker & Woods, 1976). The most significant function of this unpaid work in the family is to maintain the small intimate milieu which enhances the welfare of family members. The able-bodied adults can satisfy a variety of needs through 'caring for others' as well as through 'being cared for', where as the need to be cared for on the part of dependents can be met only through 'other's caring' (Waerness, 1978).

In the traditional household in the United States, it was the women who did household work and cared for family members. The structure of the American family has changed drastically within the last few decades but role changes within the family have not occured. The most important factors in the change of the American family is the transformation of the economic position of women and the character and conditions of their work (Hayghe, 1976). Some authors give credit to technological advancement for freeing women from household chores and making them eligible for market production (Hoffman, 1974). Others identify

inflation and the rising standard of living as economic demands that forced women to step into the job market (Hayghe, 1976).

The employment of women outside the home reduces the time and energy they have available for household production. In multi-worker families a prime concern is the reduction in available time and energy for child care and child rearing (Hayghe, 1976; Parker, 1979).

No matter how long a woman works outside of the home, she remains responsible for the bulk of household work. Husbands of employed women contribute very little or no help in household tasks (Morgan et al, 1966; Walker, 1970; Szalai, 1975; Clark, 1976; Waerness, 1978; Szinovacz, 1979). The dual role creates an extreme pressure for employed women (Robinson, Converse & Szalai, 1972). The assumption that modern technology, market goods, and services have reduced household work is not supported by research. The nature of household work and family care has increased qualitatively over time (Wilson, 1929; Lopata, 1961; Vanek, 1975; Clark, 1978). Some household appliances save a home-maker's time but machines cannot substitute for time required for the production function of child care, especially the production of social and educational development of children (Moock, 1974). In this situation, the concern about demand for quality child care on one hand and economic demand for higher standard of living on the other, pulls modern women

in two directions. The issue is, then, how does the employed homemaker solve the dilemma of balancing the allocation of time.

Statement of the Problem

The purpose of this study was to analyze time spent for physical and nonphysical care of family members in two-parent, two-child Oregon households. The problem was to determine whether or not relationships exist between time spent for care of family members and selected demographic characteristics, and to determine whether or not time spent for care of family differs by the conditions of physical care or nonphysical care.

Hypotheses

In past studies the age of the youngest child was reported to be negatively correlated to the amount of time spent for care of family members (Wilson, 1929; Morgan et al, 1966; Manning, 1968; Walker & Woods, 1976; Robinson, 1977). Amount of time spent for care of family members was also found to be related to the education of the homemaker and her spouse (Wilson, 1929; Manning, 1968; Leibowitz, 1974) and the place of residence i.e., urban/rural, urban/suburban, rural farm/nonfarm (Wilson, 1929; Manning, 1968; Walker & Woods, 1976; Robinson, 1977). Researchers have found the general socioeconomic status of the family to be

closely related to the amount of time spent for care of family members (Hill & Stafford, 1974a, 1974b, 1980). In studies where physical and nonphysical care of family members was differentiated, time spent on these tasks was related to the ages of the children in the families (Walker & Woods, 1976).

Based on the results of these previous studies , the following research hypotheses were developed for this study:

H_1. The total amount of time spent for physical care of family members is related to the age of the youngest child and whether homemaker or spouse is performing the physical care tasks.

H_2. The total amount of time spent for nonphysical care of family members is related to the age of the youngest child and whether homemaker or spouse is performing the nonphysical care tasks.

H_3. Amount of time spent for physical care of family members by the homemaker is explained by:

    a. Age of youngest child

    b. Age of oldest child

    c. Age of homemaker

    d. Education of homemaker

    e. Education of spouse

    f. Occupation of homemaker

    g. Occupation of spouse

h. Number of hours employed by the homemaker

i. Family income

j. Whether family residence is urban or rural.

H_4. Amount of time spent for nonphysical care of family members by the homemaker is explained by:

a. Age of youngest child

b. Age of oldest child

c. Age of homemaker

d. Education of homemaker

e. Education of spouse

f. Occupation of homemaker

g. Occupation of spouse

h. Number of hours employed by the homemaker

i. Family income

j. Whether family residence is urban or rural.

H_5. Amount of time spent for physical care of family members by the spouse is explained by:

a. Age of youngest child

b. Age of oldest child

c. Age of spouse

d. Education of spouse

e. Education of homemaker

f. Occupation of spouse

g. Occupation of homemaker

h. Number of hours employed by the spouse

i. Number of hours employed by the homemaker

j. Family income

k. Whether family residence is urban or rural.

H_6. Amount of time spent for nonphysical care of family members by the spouse is explained by:

a. Age of youngest child

b. Age of oldest child

c. Age of spouse

d. Education of spouse

e. Education of homemaker

f. Occupation of spouse

g. Occupation of homemaker

h. Number of hours employed by the spouse

i. Number of hours employed by the homemaker

j. Family income

k. Whether family residence is urban or rural.

Operational Definition for this Study

Age of youngest child: age by years at last birthday
classified as: under 1, 1, 2-5, 6-11, and 12-17.

Family: a household unit consisting of two parents and
two children.

Homemaker: the family member who has primary responsibility
for management of the household and/or is a secondary
wage earner. Employed homemaker is a homemaker who is
gainfully employed outside of the home for any amount
of time. Fulltime homemaker is a homemaker who is not

gainfully employed outside of the home.

Household production: activities performed in the household
to create goods and services for the purpose of family
functioning (Walker & Woods, 1976).

Market time: time spent by the homemaker in paid outside
employment.

Replacement cost: an estimate of the value of a homemaker's
time for household production by estimating the value
of paid household services that are available in the
market place.

Opportunity cost: an estimate of the value of a homemaker's
time for household production by estimating the fore-
gone earnings from outside employment by the homemaker.

Physical care: all activities related to physical care of
household members other than self such as: bathing,
feeding, dressing, and other personal care; first aid
or bedside care; taking household members to doctors,
dentist, and barber.

Nonphysical care: all activities related to the social and
educational development of household members such as:
playing with children; teaching, talking, helping
children with homework; reading aloud; chauffering and/
or accompanying children to social and educational
activities; attending functions involving children.

Assumptions

The following assumptions were made in this study:

1. The urban and rural two-parent, two-child households in this study were a representative sample of Oregon urban and rural two-parent, two-child families.

2. The majority of the time spent for care of family members was spent for care of children under 18 years of age.

3. The reported time was accurate.

4. Quality of care could be measured by time spent for nonphysical care. This was a conservative estimate of quality.

Limitations

1. Since the sample group was restricted to two-parent, two-child families in one geographic area, the findings may not be generalized to other family compositions and/or geographic areas.

2. The data provides only the durational aspects of time use. This limits the perspective of family care knowledge in its frequency and sequential order.

3. Family care tasks are frequently secondary tasks and/or require less than five minutes to accomplish. Since this study includes the recorded time of only the primary work and does not record the activities of less than five

minutes (because of five minutes blocks in the record file),
time reported for care of family members might understate
the actual amount of time spent for care of family members
and therefore, the results of the study might be affected.

II. REVIEW OF LITERATURE

The review of literature is presented in two sections:
the Theoretical Aspects of Care Within the Family, and the
Previous Research in Use of Time for Care of Family Members.
In the first section, different theories relating to the
family's role in care of children will be presented. In the
second section, descriptive patterns, important variables,
and findings of previous researchers will be reported.

I. Theoretical Aspects of Care Within the Family

Since it is assumed that most of the time spent for
care of family members is spent for care of children under
18 years of age, this review is restricted to care of
children.

The definition of family as given by Kathleen Gough is,
"a married couple or other group of adult kinfolk who coope-
rate economically and in the upbringing of children, and
all or most of whom share a common dwelling" (Gough, 1977,
p. 24).

By the above definition it is clear that one of the
important functions of the family is care of children.
Sociologists, educators, psychologists, and economists have
different perceptions of the role played by the family in
the upbringing and care of children. Sociologists perceive
the role of the family to be one of socialization, focusing

on disciplining and teaching children in an effort to pre-
pare for adult life (Clark, 1976). The importance of under-
standing the family in an attempt to determine the family's
contribution to the outcomes of schooling is widely recog-
nized by educators (Leichter, 1974). The psychologists
believe that parental attitudes affect their children's
attitudes (Nye, 1963). Economists view the family as a
cohesive and consistent decision making unit, which allocates
the time of different family members in combination with
purchased goods in order to produce desired commodities.
One such desired commodity is the rearing of children (Moock,
1974).

In order to rear children, parents allocate their time
for physical care and nonphysical care of children. Physi-
cal care includes activities such as, bathing, dressing,
feeding, first aid or bedside care and so on. The nonphysi-
cal care includes activities related to the social and
educational development of children such as, teaching,
talking, helping them with lessons, reading aloud, accom-
panying them to social and educational activities and so on.

Economics of Child Care

Traditionally, homemaking has been women's responsibi-
lity. The housewife's job is intimately connected with the
family's material and emotional well-being (Waerness, 1978).
The dollar value of homemaking can be measured through

Replacement Cost approach and Opportunity Cost approach
(Fethke & Hauserman, 1979). Replacement Cost approach
estimates the value of homemaking by estimating the value
of paid household services that are available in the market
place. Opportunity Cost approach estimates the value of
homemaking by estimating the foregone earnings in outside
employment by the homemaker.

There has been increase in demand for female labor due
to the rapid growth of service industries like health and
education (Fuchs, 1974). This is causing changes in the
life pattern of women in America. Seeing them solely in
terms of the homemaker role is inadequate. Gainful employ-
ment is very important in their lives (Bernard, 1975).

Furthermore, families have more goals than before.
Some are achievable in household work and some are achiev-
able with the extra money earned in outside jobs (Walker,
1973). Family needs often require the earned income of
women just for survival: either the woman is sole source of
income or the total family income is low. At other times,
the family's aspirations for an improved standard of living
require that extra income be earned by women (Kamerman,
1979).

The demand for women's time in the household reduces
their time for gainful employment. This reduction in market
time leads to reduction in market earnings. If the market

earnings are less than the replacement cost of household services, the opportunity cost of reallocating time to house-work is low. It becomes economical to leave gainful employ-ment and reallocate time to household work. However, if the replacement cost of household services is less than market earnings, the opportunity cost of reallocating time to household work is high. It is then economical to retain the market employment and buy household services.

There are exceptions to this conceptual framework. When children are very young there is low elasticity of substitution for women's time in mothering tasks as opposed to substitution for women's time for other household tasks. When women with young children in the household are employed, the women either reduce the standard of child care or reduce their own leisure time. Karl Marx in his essay, "On Family Life Under the Factory System", blames child negligence on employment of mothers. He sees the problem as not only one of physical care (i.e., insufficient nourishment or unsuit-able food) but one which is interactional in nature (i.e., producing an unnatural estrangement between mother and child) (Skolnick & Skolnick, 1977). Providing for the physical needs of children is important for making them able-bodied adults, and in order to raise them to be socially and economically successful adults, the parents must provide children with nonphysical care as well. Providing both

physical and nonphysical care demands large amounts of
parental time.

In an industrial society, the economic impact of the
services provided by natural resources and material products
is small in relation to the impact of the services provided
by human agents in production and consumption. In a situa-
tion where the scarcity of human time and its high value
dominates, the value of women's time also increases (Schultz,
1974). Children are time-intensive during their infancy
(Gronau, 1973; Schultz, 1974; Neimi, 1978). Therefore, when
there are younger children in the household, there is
greater demand for their mother's time. The time spent at
home in child care reduces women's available time for
employment in the job market. Therefore, the opportunity
cost of rearing children increases with the rise in value
of human time.

Children may be time-intensive when they are first
born, however, as their activities increase they become
goods-intensive (Gronau, 1977). When these goods are
produced in the market, the opportunity cost of children is
reduced if the value of mother's time is high. The price
of the market substitute (maids, nursery schools, day-cares
etc.) declines as the child grows older and/or as the value
of mother's time increases. Therefore, for many females
with low education and/or training, it is economical to

stay at home until children reach school age. Alternatively, for many others, it is most economical to put children in day care centers and return to the labor force as soon as possible (Neimi, 1978).

> The commodity form is an alienated form, and bringing housework into the arena of commodities will simply be perpetuating and increasing alienation ... we always have in mind a kind of utopia in which the work and caring come out of love rather than financial reward. ... It seems to me that if children grew up knowing that every bit of attention they demanded and received was calculated by their mothers and then charged to the state, then some of our last, ever more flimsy notion of humanity would be blown away like dust (Lopate, 1974, p. 30).

Where Carol Lopate shows the social system falling apart, Kenneth Boulding and friends introduce a very important part of the social system that is different than the system of exchange economy where human virtues like love, loyalty, trust, and community prevail. It is the Grants economy. The Grants economy is a one way transfer of exchangeables without the expectation of return (Boulding, Pfaff & Hovarth, 1972; Bivens, 1976).

Using material resources as grants, parents provide their children with physical sustenance. Using human resources as grants, parents provide their children with "facilitating know-how" which help children to venture into the world of risk and uncertainty. One of the major functions of the family is transmission of culture which includes attitude formation. In the process of culture transmission the parents can provide knowledge, wisdom, and emotional

support to the children (Bivens, 1976). This concept of
grants from parents to the children in the form of nonphysi-
cal care is very important. The amount of time spent for
nonphysical care of children by the parents is a reflection
of some concern for child quality.

Child Quality in Relation to Investment in Human Capital Theory

Investment in child quality refers to the current
expenditure (human and material) made by the parents to
create physically and emotionally healthy children. By
investing material and human resources in a child in his
early childhood, the parents expect to produce child quality.
This embodied quality that leads an individual to success
is measured by intelligence (IQ), level of schooling
attained, and market earning power (Fleisher, 1977). In
addition to these quantitative measures, human capital
implies attainment of qualitative characteristics such as,
aquisition of cultural satisfactions[1] (Schultz, 1973) and
physical and emotional health of individuals (Bivens, 1976).
These factors all yield positive returns to the society.
This investment in child quality during the early childhood
requires large amounts of parental time.

---

1. Assumed to be associated with increased level of
education.

People have expectations as to the return on their
investment of time, energy, and money devoted to rearing of
children (Thornton, 1979). Parents are both investors in
children and consumers of children's presence. The time
and goods contributed to children represents the investment
component; children's presence as a source of satisfaction
or utility to the parents represents the consumption compo-
nent (Hill & Stafford, 1974a). The investment component
can be viewed as altruistic since there is a negative corre-
lation between perceived level of resources needed for
quality child rearing and the number of children a couple
expects of rear (DeTray, 1973; Schultz, 1973; Hill & Stafford,
1974b; Thornton, 1979). Furthermore, concern for the well-
being of their children and a desire for increased child
quality may be the underlying motivational factor behind the
investment in human capital reflected by a mother giving up
market earnings in order to care for her children (DeTray,
1973; Mincer & Polachek, 1974).

Highly educated women desire high child quality.
Because they are more aware of the importance of infancy to
the future development of their children, they tend to allo-
cate more time per child to child care services production,
and produce more quality-intensive children than women with
less education (DeTray, 1973; Gronau, 1973). The marginal
value of women's time increases with education. The oppor-
tunity cost of educated women reflects the quality

intensiveness of their time because it is a part of the
human capital investment in children (Mincer & Polachek,
1974).

The interaction between child quality and number of
children is an overall constraint of family resources. The
addition of children implies fewer resources per child to
invest in quality (Schultz, 1973). The major resource
constraints are financial and time allocations (Gronau,
1976). Gary Becker identifies income elasticity with both
quality and quantity of children with higher income parents
preferring more children and higher child quality (Becker,
1960). Conversely, Blake believes that there are more social
factors than economic factors controlling parental preference
for child quality. Concern for child quality is more
intensified among the more affluent and they provide more
parent-intensive childrearing, e.g., the affluent parents
spend more time with the children than the working class
parents (Blake, 1968).

Though Becker's and Blake's theories are not comple-
mentary to each other, both provide a clear implication that
the socioeconomic characteristics of the parents is a very
important factor in the demand for child quality. They
infer that higher socioeconomic-status parents demand more
child quality than lower socioeconomic-status parents;
consequently, higher status parents are willing to spend
more time in care of children.

Summary of Part I

The family is the main institution that cares for and raises children. The family socializes children through education and culture transmission. The socialization and education of children is facilitated through allocation of time and goods within the family. This allocation of time and goods by the parents in rearing of children is called investment in human capital. The present investment in human capital is said to bear fruit in the future in the form of children's ability to lead a socially acceptable and economically successful life.

II. Previous Research in Use of Time for Care of Family Members

Research concerning homemakers' use of time for care of family members was initiated in the 1920's. Analysis of these reports includes an examination of changes in the amount of time homemakers have devoted to care of family members, as well as identification of factors reported to be related to the amount of time a homemaker used for care of family members.

In 1929 Maud Wilson, reporting the results of a study concerning Oregon homemakers' use of time, indicated that an average of seven percent of total homemaking time was assigned to the care of members of the household (Wilson,

1929). In the 1936 study of time use patterns of 502 house-
holds in Genesse County, New York by Jean Warren, the time
used for care of family members accounted for about seven
percent of the average homemaking time during the week
(Warren, 1940). However, in Walker and Woods' (1967-68)
study of time use patterns of 1,296 families in Syracuse,
New York, the time spent for care of family members amounted
to almost 23 percent of the total time spent for household
tasks (Walker & Woods, 1976). In the more recently collected
data of Walker and Sanik (1977), the time spent for nonphysi-
cal care of family members has increased by two-tenths of an
hour a day when compared to 1967-68 data (Fethke & Hauserman,
1979).

This increase in use of time for care of family members
longitudinally supports a trend in changes of time alloca-
tion reported by Vanek. Vanek reported that the nature of
household work has changed and that women today devote more
time to care of family members than to many other household
activities (Vanek, 1974).

In 1929, Maud Wilson studied use of time of 288 farm
homemakers, 71 country nonfarm homemakers, and 154 noncountry
nonfarm homemakers. The time spent for care of family
members was found to be virtually the time spent for care
of children. Between 70 and 75 percent of the time spent
for care of family members was used for their physical care
(Wilson, 1929).

In Jean Warren's 1936 study, the time spent for care of family members was found to be the most variable factor in all homemaking activities. Since the amount of time spent for care of children was the same in cases where there was one child in a family as in cases where there were two or more children of approximately the same age in a family, she concluded that time spent per child decreased with addition of more children (Warren, 1940).

In 1961-62, Sarah Manning studied the time used for household tasks by Indiana families. The sample included 53 urban, 41 rural, and 17 rural nonfarm families. The report included time spent for personal services and chauffering for children and adults. Activities such as helping children with lessons, reading to and playing with children were included in physical care. The amount of time spent for physical care of family members was more when the child was young. Less time was spent in individual child care as the number of children in a family increased (Manning, 1968).

Robinson (1977) used the Survey Research Center data base derived from Americans' Use of Time (1965-66) to analyze the child care time. The women reported the majority of the child care time. However, most women's child care was custodial (feeding, dressing etc.) in nature, while most men's child centered activities were interactional (playing with children, helping with school work

etc.) in nature.

Walker and Woods (1976) analyzed the time use patterns of 1,296 Syracuse, New York households using 1967-68 Cornell Time-Use Survey data. Among all household activities the greatest amount of secondary time[2] reported was in family care. In their study, time spent for physical care accounted for 47 percent and nonphysical care accounted for 53 percent of all time reported for care of family members.

Philip Stone looked at the patterns of child care in twelve countries. He used the Multinational Comparative Time-Budget Research data and reported that American parents devoted more time for care of preschool children and less time for older children than the parents in other countries. They also spent more time in chauffering children and less time in helping children with their schoolwork than the parents in other countries (Stone, 1972).

Peter Lindert in his study of position and achievement of young children, used 1967-68 Cornell Time-Use Survey data. Attributes of parents were found to be less signifi-cant than ages and number of children present in determining the amount of time spent for child care (Lindert, 1977).

Leibowitz also used Cornell data and reported family

---

2. Secondary time is when some work on an activity is done while work on another activity received primary attention. Secondary time used for family care activities was princi-pally for nonphysical care.

background variables (i.e., education, income etc.) to be
related to the quantities of time and goods devoted by the
parents to the children (Leibowitz, 1974). In another
study, Sesame data[3] was used to determine parental inputs
for child care and children's achievement (Leibowitz, 1977).
The verbal development of the children was found to be
positively related to the nonphysical care time inputs by
parents.

Hill and Stafford used the Productive American Survey
data of 1965 and found that the time devoted to care of
preschool children differed among socioeconomic-status
groups. Higher socioeconomic-status parents spent more
time with preschool children than lower socioeconomic-status
parents (Hill & Stafford, 1974b). They continued their
investigation by using data from 1969 Wave of the Panel
Study of Income Dynamics (Hill & Stafford, 1974a) and the
Time Use Survey data compiled by the Survey Research Center
of Michigan in 1975-76 (Hill & Stafford, 1980). The socio-
economic status of the parents was found to be strong in
determining the amount of time devoted to child care.
Among higher socioeconomic-status groups, the child inputs
(time spent with child) were found to be maintained at
relatively high levels even when mother's labor force

---

3. Sesame data were originally collected by the Educa-
tional Testing Service for an evaluation of the Children's
Television Workshop's television program for preschoolers,
Sesame Street.

participation increased. Employed women in higher socio-economic-status groups were found to manage high levels of child inputs (time spent with children) by reducing their own personal care time and passive leisure time.

From studies, it has been shown that the amount of time spent for physical and nonphysical care of family members increased over time. The nature of care has also changed over time. In the past, the major portion of time spent for care of family members was for physical care (Wilson, 1929), while in recent years, the major portion of time spent for care of family members is for nonphysical care (Walker & Woods, 1976). The major determinants of the amount of time spent for care of family members are ages and number of children, and socioeconomic-status of the parents. Women tend to spend more time on physical care of family members, while men spend more time for nonphysical care.

Selected Variables

The results of previous studies relating to the selected variables used in this study are reported in this section.

Age of youngest child and oldest child: A negative correlation was found between the age of youngest child and the amount of time spent for care of family members

(Wilson, 1929; Warren, 1940; Manning, 1968; Walker & Woods, 1976; Robinson, 1977). Walker and Woods (1976) indicated that young children create an increased demand for physical care while older children create an increased demand for nonphysical care.

Number of children and age of homemaker: Robinson (1977) reported that homemakers spent more time for care of family members as the number of children increased, but Warren (1940) and Manning (1968) reported that time per child decreased with each additional child. Manning reported a significant relationship between the age of the homemaker and the amount of time spent for care of family members. She found that the time spent for care of children decreased with an increase in the age of homemaker. Of all the women, the 20-29 years old group spent the most time in child care. They had fewer children than the women 30 to 49 years old, but were more likely to have children under two years. The 40 to 49 years old group averaged the greatest number of children and made the most chauffering trips (Manning, 1968).

Socioeconomic status: Hill and Stafford (1974a, 1974b, 1980) reported socioeconomic status (SES) to be an important determinant of the amount of time spent for care of children. The factors determining SES were the education, income, and occupation of the parents. They found that wives with lower SES spent much less time than did other wives on their children prior to the children entering grade school. On a

per child basis, higher SES mothers allocated between two and three and one half times as much of their nonlabor market time to their preschool children as did low SES mothers (Hill & Stafford, 1980).

Education of homemaker and spouse: In general a positive relationship between education of homemaker and the spouse and the amount of time spent for care of family members has been reported (Wilson, 1929; Manning, 1968; Leibowitz, 1974; Goldberg, 1977; Hill & Stafford, 1980). However, Robinson (1977) reported only marginal support for the hypothesis that better educated parents devote more time for child care.[4] He used 1973 Omnibus Child Care data to verify his doubts. This time the relationship was negative with less educated women spending more time in care of children than the more educated women (Robinson, 1977). Lindert (1977) reported that parents' educational level was less significant in determining the amount of time devoted to child care than the number of children. He stated that the only way in which more educated women as a group managed to devote more time to each child was by having fewer children on the average.

Occupation of spouse: In Manning's study, occupation of husband was found to be related to the time spent in the care of family members. Homemakers whose husbands were

---

4. In his study of 1965-66 Survey Research Center data.

engaged in nonfarm occupations spent more time in care of children and received more help from hired helpers (Manning, 1968).

Family income: Only one study reported a significant relationship between level of family income and amount of time spent for care of family members. Hill and Stafford found that while the husbands' wage and annual income was unimportant in determining their own time allocation to preschool children, it was important in relation to the wives' time allocation to preschool children. A substantial income effect was found in the amount of time spent for care of children by the wives, with wives whose husbands had higher income spending more time with preschool children than the wives whose husbands had lower level of income (Hill & Stafford, 1974a).

Whether or not homemaker is gainfully employed: Robinson (1977) reported that women who were employed spent less time for care of children than the women who were not employed, both for contact time (nonphysical in nature) and primary activity time (physical in nature). Walker and Woods (1976) reported that both employed and nonemployed mothers spent more time for physical care of family members when the children in the family were young. But employed mothers spent much less time for care of family members regardless of the age of youngest child. Goldberg found nonworking mothers to have more available contact time than mothers

who worked part-time or full-time. However, mothers who were home all day with their children and mothers who worked actually spent approximately the same amount of time in direct contact (nonphysical in nature) with their children. In fact, even though the nonemployed mothers had more time available than the employed mothers, they spent the least time in direct contact with their preschoolers in comparision to part-time or full-time employed (Goldberg, 1977).

Whether homemaker or spouse performed the care: Homemakers spent more time for care of family members than the spouses (Morgan et al, 1966; Manning, 1968; Walker, 1970; Clark, 1976; Robinson, 1977). Those spouses who did help with the care of family members, tended to help more with the nonphysical care of family members than the physical care (Clark, 1976; Walker & Woods, 1976).

Whether family residence is urban or rural: Nonfarm families spent more time for care of family members than the farm families (Wilson, 1929; Manning, 1968). Robinson (1977) reported that parents in the larger inner cities spent more time for care of children than parents in rural areas.

Summary of Part II

In previous studies researchers found the age of the youngest child to be the most important determinant of time

spent for care of family members. Additionally, parents
with higher socioeconomic status were found to spend more
time for care of children than parents of lower socioeconomic
status. Parents who had attained higher level of education
gave higher quantity of child care than less educated parents
as measured by quantity of time and quantity of goods. Other
demographic characteristics such as, age, occupation, income,
and employment of parents have been found to be related to
the amount of time spent for care of family members. The
amount of time spent for care of family members also varied
with place of residence (urban/rural). Homemakers spent
more time for care of family members than the spouses.

III. METHODOLOGY

This chapter deals with three sections: Selection of
Sample, Collection of Data, and Analysis of Data.

Selection of Sample

The data used for this study were obtained from Inter-
state Urban/Rural Comparision of Families' Time Use; a con-
tributing project of the Northeast Regional Research Project
NE-113. This eleven state project was coordinated through
Cornell University, New York. The objectives of the
project were to establish a data bank on families' use of
time and to compare time use among urban and rural families
in different geographic areas of the U.S.

The research in Oregon was conducted by the Department
of Family Resource Management at Oregon State University
with support from the State Agricultural Experiment Station.
In view of the objective of urban/rural comparision, the
two areas selected for investigation were the Portland
Standard Metropolitan Statistical Area (excluding portions
of the State of Washington) and the portion of rural Linn
and Benton counties surrounding the city of Albany.

To control for family size in the interstate project
samples were limited to two-parent, two-child households.
The samples were then stratified into five groups according
to the age of the youngest child; (1) under one year of age,

(2) one year of age, (3) 2-5 years of age, (4) 6-11 years of age, and (5) 12-17 years of age. The distributions of the other variables in the population from which the sample was drawn were assumed to be normal.

The major portion of the rural sample was drawn from Linn County, Oregon within a five mile radius of the city of Albany. This area also includes a small portion of Northeast Benton County (Appendix A). The original rural sample was identified through use of the 1975 Albany City Directory. A list was prepared of all two-parent, two-child and two-parent, one-child families. Families with both parents and either one or two children were then listed according to the five strata mentioned above. Additional families for the first and second strata were identified by checking the Albany Vital Statistics, Department of Health records and noting new births to one child families. Also new births in Linn County were continuously monitored in the local newspaper. A random sample was then drawn from these five stratified lists by selecting every nth family and making a telephone call to verify family composition. This procedure was repeated midway through the interview schedule using the 1977 Albany City Directory, to obtain new births in one child rural farm/nonfarm families.

The urban sample was drawn from the Portland Standard Metropolitan Statistical Area (SMSA) (Appendix B). The

majority of the sample was drawn from Multnomah County.
The urban sample was selected, interviewed, and monitored
by a professional marketing research group. Two methods
were used to select the urban sample.

Method I: Three-fourths of the urban sample was
obtained by asking families already participating in another
cross-sectional study if they had children and if so in
what age agoups. From these identified families, lists of
two-parent, two-child families were prepared and stratified
into the five age group categories. All potential respon-
dents were then called from the professional research office
to gain permission for the interview and to set up appoint-
ments. Of the 189 families contacted in this manner, 112
families refused and 77 families agreed to participate.
The completion rate was 41 percent with a refusal rate of
59 percent.

Method II: The remaining urban sample was identified
by the research office through telephone screening.
Numebers were drawn at random from the SMSA telephone direc-
tory by using a random digit table. Families meeting the
required composition were asked to participate. Interviews
were scheduled for those willing to participate. In this
method, the professional research group did not keep
records on the number of families contacted nor did they
keep the number that refused to participate. Thus, no
completion or refusal rates are available for this portion

(27%) of the urban data. Twenty eight families completed
interviews in this method, making the total urban sample
of 105 families.

For the rural sample, a total of 331 families were
contacted. Of these 110 did not fit the strata criteria
and 11 had moved or could not be located. A total of 123
interviews were completed, including 18 with subjects
residing within the Albany city limits which were not
included in the study. The completion rate was 59 percent
with a refusal rate of 24 percent (81 of the 331 contacted
refused to participate). A total of 105 interviews were
included in the rural sample.

Once the group of potential respondents were estab-
lished, a letter was sent by the Department of Family
Resource Management to each respondent inviting them to
participate in the study (Appendix C). Interviewers then
contacted families within a week to confirm willingness to
participate, and to set up appointments for interviews.

The final sample consisted of 210 two-parent, two-
child families. The sample was equally divided by area of
residence (105 urban and 105 rural) and each of the five
strata was represented by equally distributed sample size
(21 families in each stratum).

Collection of Data

Two instruments were used for collection of data: a

questionnaire and a time chart. The questionnaire provided
supplemental information such as, demographic characteris-
tics, housing characteristics, and meal patterns. Time
charts were furnished for the recording of time spent in
each of 18 categories. The categories defined activities
within household work, paid/unpaid work, and nonwork group-
ings. Time charts accounted for 24 hours, and were divided
into ten-minute blocks. Each ten-minute block could be
divided in half, allowing estimation of time spent to the
nearest five minutes (Appendix D).

Each family completed charts for two 24-hour periods.
The first chart was completed by the homemaker recalling
the previous day's activities, with the help of the inter-
viewer. The second chart was recorded by the homemaker
herself on the day following the interview. The activities
recalled and recorded included the activities of all family
members six years of age or older.

The data were collected between January and December
1977. Scheduling of interviews was controlled to allow
for equal distribution over days of the week and seasons
of the year.

Interviewers were hired and instructed for data collec-
tion in the field. They were trained and monitored by
research associates in the University and by the cooperative
marketing research firm. The interviewers called upon the
homemakers and assisted them in recalling and recording the

previous day's activities for all family members six or
over. They explained time charts and their use to home-
makers in person, then they left a second chart for record-
ing the activities of the following day. Having arranged
a second meeting time at the initial interview, the return
visit allowed review of the chart to correct errors and to
collect questionnaire data. The first interview lasted one
to two hours, and the second meeting lasted approximately
one-half an hour. A payment of $10 was made to the families
at the second meeting as an appreciation and in recognition
of the time and effort they provided for the study.

After the completion of data collection compiled re-
cords were edited, coded, and entered on a computer tape.
For this study, the following variables were drawn from the
computer tape for the analyses of time spent for physical
and nonphysical care of family members:

1. Age of youngest child, coded to the nearest year
2. Age of oldest child, coded to the nearest year
3. Age of homemaker, coded to the nearest year
4. Age of spouse, coded to the nearest year
5. Education of homemaker, coded in ten categories
6. Education of spouse, coded in ten categories
7. Occupation of homemaker, coded in 17 categories
8. Occupation of spouse, coded in 17 categories
9. Number of hours employed by homemaker, coded to the
   nearest hour

10. Number of hours employed by spouse, coded to the nearest hour

11. Family income, coded in 14 categories

12. Whether family residence was urban or rural

13. Whether homemaker or spouse performed the care.

The data collected for Project NE-113 is micro data rather than cross-sectional data. This micro nature of the data may have possible influence on the findings of present investigation.

Analysis of Data

The hypotheses to be tested in this study were:

H_1. The total amount of time spent for physical care of family members is related to the age of the youngest child and whether homemaker or spouse is performing the physical care tasks.

H_2. The total amount of time spent for nonphysical care of family members is related to the age of the youngest child and whether homemaker or spouse is performing the nonphysical care tasks.

H_3. Amount of time spent for physical care of family members by the homemaker is explained by:

a. Age of youngest child

b. Age of oldest child

c. Age of homemaker

d. Education of homemaker

e. Education of spouse

f. Occupation of homemaker

g. Occupation of spouse

h. Number of hours employed by homemaker

i. Family income

j. Whether family residence is urban or rural.

H_4. Amount of time spent for nonphysical care of family members by the homemaker is explained by:

a. Age of youngest child

b. Age of oldest child

c. Age of homemaker

d. Education of homemaker

e. Education of spouse

f. Occupation of homemaker

g. Occupation of spouse

h. Number of hours employed by homemaker

i. Family income

j. Whether family residence is urban or rural.

H_5. Amount of time spent for physical care of family members by the spouse is explained by:

a. Age of youngest child

b. Age of oldest child

c. Age of spouse

d. Education of spouse

e. Education of homemaker

f. Occupation of spouse

g. Occupation of homemaker

h. Number of hours employed by spouse

i. Number of hours employed by homemaker

j. Family income

k. Whether family residence is urban or rural.

H_6. Amount of time spent for nonphysical care of family members by the spouse is explained by:

a. Age of youngest child

b. Age of oldest child

c. Age of spouse

d. Education of spouse

e. Education of homemaker

f. Occupation of spouse

g. Occupation of homemaker

h. Number of hours employed by spouse

i. Number of hours employed by homemaker

j. Family income

k. Whether family residence is urban or rural.

Types of Variables

The variables such as, ages and number of hours employed are continuous variables. These variables are capable of taking on an ordered set of quantitative values within a certain range. The variables such as, education, income, and occupation are polytomous categorical variables that have more than two subsets.

For each polytomous categorical variable ordinal scales
were developed on which positions could be indentified in
rank order with no implication as to the distance between
positions. The categorical variables that were given ordi-
nal scales and used as indexes for socioeconomic status
were occupation, education, and income. This was done to
show the relationship of socioeconomic characteristics
to the amount of time spent for care of family members.
Using Alba M. Edward's technique of social-economic grouping
of occupation (Miller, 1974), the occupation variable was
grouped into four categories. Using United States 1960
Census socioeconomic status scores of occupation (Miller,
1974), the four categories were ranked by occupation score
from lowest to highest as follows:

01 = Homemaker, none

02 = Service, labor, craft

03 = Clerical, sales

04 = Managerial, professional.

Grouping and ranking of the education variable was
done according to the level of education achieved. Levels
were ranked from lowest level of education to the highest
level of education as follows:

01 = Grade school

02 = Some high school

03 = High school graduate

04 = Vocational & technical training

05 = Partial college

06 = Associate degree

07 = Bachelor degree

08 = Master degree

09 = Doctorate

10 = Professional degree.

Income categories were formed according to the expectation of frequency of observations within categories. Categories were ranked from lowest to the highest income as follows:

01 = Under $1,000

02 = $ 1,000 - $ 1,999

03 = $ 2,000 - $ 2,999

04 = $ 3,000 - $ 3,999

05 = $ 4,000 - $ 4,999

06 = $ 5,000 - $ 5,999

07 = $ 6,000 - $ 7,499

08 = $ 7,500 - $ 9,999

09 = $10,000 - $11,999

10 = $12,000 - $14,999

11 = $15,000 - $19,999

12 = $20,000 - $24,999

13 = $25,000 - $49,999

14 = $50,000 and over.

The variable, family residence is a dichotomous categorical variable where the individual being categorized

either has the defining property or does not have it
(Kerlinger, 1973). The dichotomous variable is also
expressed as "qualitative variable", and in this analysis
it is assigned values of zero and one.

Because of concern for reliability and validity of
analyses done using categorical variables (income, education,
and occupation) as indexes for socioeconomic status in the
regression, further analysis was undertaken. In the second
approach midpoints of all the income categories were used
for the analyses. The income midpoints were as follows:
1 = 1,000, 2 = 1,500, 3 = 2,500, 4 = 3,500, 5 = 4,500,
6 = 5,500, 7 = 6,700, 8 = 8,250, 9 = 11,000, 10 = 13,500,
11 = 17,500, 12 = 22,500, 13 = 37,500, 14 = 60,000. Indi-
cator (dummy) variables were used for education and occu-
pation categories.

The dummy variable is a binary variable that takes one
of two possible values: zero or unity. Unity usually refers
to the presence of characteristic, and zero refers to the
absence of the characteristics. The dummy variables used
in this analysis are constant term variables. The use
of intercept (constant) dummy variables assumes that cate-
gorical variables do not influence the coefficients of
other continuous variables. The categorical variables may
be allowed to change the coefficients of other continuous
variables by using slope dummy variables. However, because
there were six continuous variables and total of 24 differ-

ent categories, the total number of variables to be effectively used in the model is much larger. In this study, where the sample size is 210, use of slope dummy variables does not appear feasible from computational point of view.

The indicator variables assigned to the categories for homemaker's education were as follows:

HEDUC[5]   HEDIND[6]

1. Grade school   HEDIND 1

2. Some high school   HEDIND 2

3. High school graduate   HEDIND 3

4. Vocational & technical training   HEDIND 4

5. Partial college   HEDIND 5

6. Associate degree   XXX

7. Bachelor degree   HEDIND 6

8. Master degree

The use of indicator variables for the homemaker's education was as follows:

HEDUC	1	2	3	4	5	7	8
HEDIND 1	1	0	0	0	0	0	-1
HEDIND 2	0	1	0	0	0	0	-1
HEDIND 3	0	0	1	0	0	0	-1
HEDIND 4	0	0	0	1	0	0	-1
HEDIND 5	0	0	0	0	1	0	-1
HEDIND 6	0	0	0	0	0	1	-1.

---

5. HEDUC = Level of education completed by the homemaker.
6. HEDIND = Indicator for level of homemaker's education.

The indicator variables assigned to the categories for spouse's education were as follows:

SEDUC[7]		SEDIND[8]
1.	Grade school	XXX
2.	Some high school	SEDIND 1
3.	High school graduate	SEDIND 2
4.	Vocational & technical training	SEDIND 3
5.	Partial college	SEDIND 4
6.	Associate degree	SEDIND 5
7.	Bachelor degree	SEDIND 6
8.	Master degree	SEDIND 7
9.	Doctorate	SEDIND 8
10.	Professional degree	

The use of indicator variables for the spouse's education was as follows:

SEDUC	2	3	4	5	6	7	8	9	10
SEDIND 1	1	0	0	0	0	0	0	0	-1
SEDIND 2	0	1	0	0	0	0	0	0	-1
SEDIND 3	0	0	1	0	0	0	0	0	-1
SEDIND 4	0	0	0	1	0	0	0	0	-1
SEDIND 5	0	0	0	0	1	0	0	0	-1
SEDIND 6	0	0	0	0	0	1	0	0	-1
SEDIND 7	0	0	0	0	0	0	1	0	-1
SEDIND 8	0	0	0	0	0	0	0	1	-1.

7. SEDUC = Level of education completed by the spouse.
8. SEDIND = Indicator for level of spouse's education.

The indicator variables assigned to the categories for occupation of the homemaker were as follows:

HOCC[9]   HOCIND[10]

1. Homemaker, none   HOCIND 1

2. Service, labor, craft   HOCIND 2

3. Clerical, sales   HOCIND 3

4. Managerial, professional

The use of indicator variables for the homemaker's occupation was as follows:

HOCC	1	2	3	4
HOCIND 1	1	0	0	-1
HOCIND 2	0	1	0	-1
HOCIND 3	0	0	1	-1.

The indicator variables assigned to the categories for occupation of the spouse were as follows:

SOCC[11]   SOCIND[12]

1. Homemaker, none   XXX

2. Service, labor, craft   SOCIND 1

3. Clerical, sales   SOCIND 2

4. Managerial, professional

---

9. HOCC = Homemaker's occupation.
10. HOCIND = Indicator for homemaker's occupation.
11. SOCC = Spouse's occupation.
12. SOCIND = Indicator for spouse's occupation.

The use of indicator variables for the spouse's occupation was as follows:

SOCC	2	3	4
SOCIND 1	1	0	-1
SOCIND 2	0	1	-1.

Statistical Analysis

The data were analyzed using three different statistical tools. Simple Regressions and two-tailed t-tests for the difference between means of independent samples were used to test hypotheses one and two. Multiple Regressions were used to test hypotheses three, four, five, and six. To test the significance of regression and correlation coefficients, F-tests (Analyses of Variance) and t-tests for difference between two correlated coefficients for correlated samples were used.

The basic equation of Simple Regression is: $Y' = a + bX$ where, Y' = predicted values of the dependent variables, a = intercept constant, b = regression coefficient, and X = the values of the independent variables.

The intercept constant, a, is the point where the regression line intercepts the Y axis. It is calculated with the formula: $a = \bar{Y} - b\bar{X}$. The formula for the regression coefficient or slope, b, is: $b = \dfrac{\sum xy^2}{\sum x^2}$. The slope indicates the change in Y with a change of one unit of X.

The formula for t-test for the difference between means of independent samples is:

$$t = \frac{(\bar{X}_1 - \bar{X}_2)}{\sqrt{s^2/n_1 + s^2/n_2}}$$

with (n-1) degrees of freedom, where, $\bar{X}_1$ = mean of sample one, $\bar{X}_2$ = mean of sample two, s = standard error, and n = sample size.

The basic prediction equation for Multiple Regression is: $Y' = a + b_1X_1 + b_2X_2 + \ldots b_kX_k$. Symbol, k, is the total number of independent variables in a regression equation. The value of a is given by the equation: $a = \bar{Y} - b_1\bar{X}_1 - b_2\bar{X}_2 - \ldots b_k\bar{X}_k$. The objective of the determination of the b's is to find those b values that will minimize the sum of square of the residuals.

The initial purpose of the multiple regression analysis was to measure and evaluate the overall dependence of the amount of time spent for care of family members on the entire set of variables. A second analysis was done in order to examine the relationship between amount of time spent for care of family members and each particular variable while controlling for the remaining variables. Then a third analysis was performed in order to choose a set of independent variables that would best predict the relationship using the fewest number of variables.

For the initial purpose, multiple regressions were
run including all the independent variables in the equation.
This gave the overall relationship between the amount of
time spent for care of family members and the chosen set of
independent variables. For the second analysis, each multi-
ple regression excluded one variable from the equation.
This gave the magnitude of relationship between the amount
of time spent for care of family members and each one of
the individual independent variables. For the third analy-
sis, stepwise multiple regressions were run. This gave the
selected set of independent variables which provided the
best prediction possible with the fewest number of indepen-
dent variables.

The coefficient of determination, also called <u>explained</u>
<u>variance</u> or $\underline{R}^2$, indicates that portion of the variance of
the dependent variable, Y, accounted for by the independent
variables, X_k. R^2 takes values only from zero to one,
because R^2 is equal to the ratio of explained variation in
Y to the total observed variation in Y. The explained
variation is attributable to the independent variables.

Test of Significance

To show that the relationship of X's to the Y had not
arisen by chance, F-tests were done to determine whether or
not the regression coefficient, b, was significantly differ-
ent than zero. F, is the ratio of the mean square due to

regression to the deviations of mean square. The formula for F-test in one-way Analysis of Variance is:

$$F = \frac{SS_b \;/\; df_1}{SS_w \;/\; df_1}$$

where, SS_b = between-group sum of squares, SS_w = within-group sum of squares, df_1 = degrees of freedom associated with SS_b, and df_2 = degrees of freedom associated with SS_w. The formula for F-test in Regression Analysis is:

$$F = \frac{SS_{reg} \;/\; df_1}{SS_{res} \;/\; df_2}$$

where, SS_{reg} is the sum of squares of the dependent variable due to regression, SS_{res} is the sum of squares of residuals, or the deviations from regression. The degrees of freedom are: $df_1 = k$, and $df_2 = N-k-1$, where, k = the number of independent variables, and N = the sample size.

To test the significance of the difference between two correlated coefficients for correlated samples, a t-test was used. The formula for the t-test is:

$$t = \frac{(r_{12} - r_{13}) \sqrt{(N-3)(1+r_{23})}}{\sqrt{2(1 - r_{12}^2 - r_{13}^2 - r_{23}^2 + 2r_{12}r_{13}r_{23})}}$$

where, r_{12} = correlation coefficient of dependent variable and independent variable number one, r_{13} = correlation coffecient of dependent variable and independent variable

number two, r_{23} = correlation coefficient of two independent variables, and N = the sample size.

Since some of the cell values in the data were less than five, the designated level of significance for all the statistical tests was chosen to be .10.

Use of Weights

Since the sampling was stratified, the arithemetic mean of the sample observations was not the estimate of population mean. In stratified sampling an estimate of the population mean can occur only in one important special case, i.e., when there is proportional allocation from each stratum (Snedecor & Cochran, 1978). But in this study, the number of sample observations were not proportional to the population, instead they were in equal number in each stratum. This caused oversampling in some strata and undersampling in others. To make a true estimate of the population mean, the respective strata were weighted. The value of the weights are:

Age of youngest child	Urban	Rural
Under 1	.5851	.3018
1	.4800	.3283
2-5	1.2651	1.1584
6-11	1.5451	1.8876
12-17	1.1251	1.3245

The manner in which the weights were calculated was as follows, using the rural families as an example:

$$w = \frac{\text{number of rural two-parent, two-child families with youngest child under 1}}{\text{total number of rural two-parent, two-child families}} \times 5.$$

The weights were scaled so that their sum over all urban (or over all rural), after being multiplied by 21 (sample size in each stratum) would equal 105, which was the total sample size in urban (rural) area.

In order to obtain weights for the rural sample all two-parent, two-child families listed in the 1975 Albany City Directory were counted and charted by age of youngest child into five strata. This was the same directory used to identify the original Oregon rural sample.

The 1975 directory listed children born through April of 1975. In order to count families with children born in 1976 (one year old stratification) and 1977 (under one year stratification), two-parent, two-child families were identified and counted in the 1979 Albany City Directory. Also deletions of families were made if it was noted in the previously counted two-parent, two-child families. The 1979 directory was used versus the 1977 directory to insure inclusion of all 1977 births.

The urban weights were obtained through the Bureau of Governmental Research and Service at the University of Oregon. A special program was written to extract the number

of two-parent, two-child families delineated by the age of
youngest child from the 1970 Oregon Census, one-in-a-hundred
state sample file for the state of Oregon (Based on the
15 percent data sample). The file was one of the public
use microdate files released by the Bureau of Census. This
program was not able to separate out age distribution of
children in the Portland area. All metropolitan populations
in Oregon, which included Salem, Eugene, and Portland were
included in this count. This weighting for the urban
sample assumed that the age distribution of children in all
Oregon metropolitan areas was similar.

IV. FINDINGS

The findings of the study are presented in two sec-
tions: a Description of the Sample Data, and Results of
Statistical Analyses.

Description of the Sample Data

Data used for this study were collected from 210
two-parent, two-child families living in Oregon. The data
were collected between January and December 1977. In order
to compare time use of urban/rural households, half of the
sample was from families residing in urban areas and half
of the sample was from families residing in rural areas.
The urban sample was selected from families living in the
Portland Standard Metropolitan Statistical Area. The
rural sample was selected from families living in rural
Linn and part of Benton counties. The sample of 210
families was stratified into five groups according to the
age of youngest child.

Age of Youngest Child and Oldest Child

A summary of the ages of the youngest child and the
oldest child in each family is presented in Table 4:1.
The mean age for the youngest child was 5.6 years, and
ranged from less than one year to 16 years. For the
oldest child, the mean age was 8.5 years, and ranged from
one year to 18 years.

TABLE 4:1 Distribution of 210 Families by Age of Youngest
          Child and Age of Oldest Child

Age in Years	Youngest Child		Oldest Child	
	Number of families	Percent	Number of families	Percent
Less than 1	42	20.0	0	0.0
1	42	20.0	4	1.9
2-5	42	20.0	71	33.8
6-11	42	20.0	70	33.3
12-17	42	20.0	65	31.0
TOTAL	210	100.0	210	100.0

Ages of Homemaker and Spouse

The ages of homemakers ranged from 18 years to 54 years.
The ages of spouses ranged from 20 years to 54 years. The
mean age for the homemakers was 33 years and for the spouses,
the mean age was 35 years.

Education of Homemaker and Spouse

The summary for level of education achieved by home-
makers and spouses is presented in Table 4:2. Homemakers
with high school education were predominant (40%) in the
sample. Although nearly 50 percent of the homemakers had
attended college, only 19 percent had completed the
Bachelor's degree and only three percent had completed the
Master's degree. Compared to the national average, the

overall level of education of the sampled homemakers was
high. For the nation in 1978, the level of education
completed by females 25 years and older was 19.5 percent
for elementary school, 55.8 percent for high school, and
24.7 percent for college (Statistical Abstract, 1978).

TABLE 4:2 Education Levels for Homemakers and Spouses

Highest Level of Education Completed	Homemaker		Spouse	
	Number	Percent	Number	Percent
Grade school	2	1.0	0	0.0
Some high school	9	4.3	13	6.2
High school graduate	84	40.0	55	26.2
Vocational & technical training	10	4.8	10	4.8
Partial college	58	27.6	47	22.4
Associate degree	0	0.0	5	2.4
Bachelor degree	40	19.0	55	26.2
Master degree	6	2.9	13	6.2
Doctorate	0	0.0	1	0.5
Professional degree	0	0.0	10	4.8
Missing values	1	0.5	1	0.5
TOTAL	210	100.0	210	100.0

The overall educational attainment for the spouses was
higher than for the homemakers. The level of education com-
pleted by the spouses was higher than homemakers' in college

degree categories. Nearly 38 percent of the spouses completed college degrees as compared to about 22 percent of homemakers. The education levels of the males were higher than the national average. For the U.S., the level of education completed by males 25 years and older was 20.4 percent for elementary school, 46 percent for high school, and 33.6 percent for college in 1978 (Statistical Abstract, 1978).

Occupation of Homemakers and Spouses

The summary of occupation of homemakers and spouses is presented in Table 4:3. More than two-thirds of the home-makers were fulltime homemakers. Nearly 33 percent of the homemakers were gainfully employed outside of home. Of the employed homemakers, about 72 percent worked in white collar occupations and more than half of these reported being employed in managerial-professional positions.

More spouses than homemakers were engaged in blue collar positions. The percentage of spouses in the cleri-cal and sales category was very low compared to the percent-age of homemakers in that category: 11 percent of the employed spouses as compared to 32 percent of the employed homemakers. Spouses in the sample reported being engaged in managerial-professional occupations were in higher percentage than the national average. In the U.S., 29 percent of the employed males were engaged in managerial-

professional occupations in 1977 (Statistical Abstract,
1978). In the sample, spouses employed in managerial-
professional occupations were 47 percent of the total
spouses employed.

The percentage of both homemakers and spouses engaged
in white collar occupations was higher than the national
average. In 1977, the percentage of employed persons
engaged in white collar occupations was 40.9 percent for
males and 63.2 percent for females (Statistical Abstract,
1978). In the sample it was 58 percent for the spouses
and 73 percent for the homemakers. But in accordance with
the national trend, in the sample the percentage of females
engaged in white collar occupations was higher than the
males.

TABLE 4:3 Occupation of Homemakers and Spouses

Occupation Category	Homemaker		Spouse	
	Number	Percent	Number	Percent
Homemaker, none	141	67.1	4	1.9
Service, labor, craft	19	9.1	87	41.4
Clerical, sales	22	10.5	22	10.5
Managerial, professional	28	13.3	97	46.2
TOTAL	210	100.0	210	100.0

Hours of Employment of Homemakers and Spouses

The summary of hours of employment of homemakers and spouses is presented in Table 4:4. More than two-thirds of the homemakers were fulltime homemakers who did not work for pay in outside job. Only about 32 percent of the homemakers were employed. Fifty seven percent of the employed home-makers worked for less than 30 hours a week. Homemakers who worked for more than 30 hours a week constituted a very small percentage (14%) of the total homemakers in the sample.

TABLE 4:4 Weekly Hours of Employment of Homemakers and Spouses

Weekly Hours	Homemaker		Spouse	
	Number	Percent	Number	Percent
0	143	69.0	8	4.0
1-14	16	8.0	0	0.0
15-30	22	10.0	0	0.0
30-44	24	11.0	98	47.0
45 and over	5	2.0	104	49.0
TOTAL	210	100.0	210	100.0

Of the total sample (male and female combined), 36 percent were not employed, 16 percent were employed home-makers, and 48 percent were employed spouses. The ratio for employed male to employed female was 4:1. The national and state average of male and female employment was 59

percent for male and 41 percent for female. The national statistics of employed persons, married and spouse present constituted 65 percent of the total employed persons in the U.S., 42 percent male and 23 percent female (Statistical Abstract, 1978). The percentage of employed females was much lower and the percentage of employed males was much higher in the sample than the state and national average.

Employed spouses in the sample comprised 96 percent of the total number of spouses. All spouses were employed for 30 hours or more per week.

Family Income

The summary of family income of 210 families is presented in Table 4:5. Families in the sample were largely representative of middle and higher income groups. More than 70 percent of the families had an income of $15,000 or more. The Social Accounting for Oregon showed that in 1975, 41.8 percent of the families had an income of less than $10,000. Thirty three percent had an income of less than $8,000. Families with an income of $15,000 or more constituted only about 34 percent of the total Oregon families. Only about eight percent of the families had an income of $25,000 or more (Social Accounting for Oregon, 1977). There were no families with an income of less than $6,000 in the sample. Seventy one percent of the families had an income of $15,000 or more. Families with an income

of $25,000 or more constituted 25 percent of the sampled families, which was three times more the state average.

TABLE 4:5 Total Family Income Before Tax for 210 Families

Annual Income	Number of Families	Percent
Under $1,000	0	0.0
$ 1,000 - $ 1,999	0	0.0
$ 2,000 - $ 2,999	0	0.0
$ 3,000 - $ 3,999	0	0.0
$ 4,000 - $ 4,999	0	0.0
$ 5,000 - $ 5,999	0	0.0
$ 6,000 - $ 7,499	3	1.4
$ 7,500 - $ 9,999	10	4.8
$10,000 - $11,999	11	5.2
$12,000 - $14,999	37	17.6
$15,000 - $19,999	52	24.8
$20,000 - $24,999	44	21.8
$25,000 - $49,999	45	21.4
$50,000 and over	8	3.8
TOTAL	210	100.0

The median income was $16,730; which was much higher than the state median income of $13,750 in 1976 (Social Accounting for Oregon, 1977). Compared to the national median income of $17,616 for all husband-wife families in

1977 (Statistical Abstract, 1978), the median income for
the sample was lower.

Results of Statistical Analyses

H_o1. There is no significant difference in the total
amount of time spent for physical care of family members

a. by the age of youngest child, and

b. whether physical care is performed by the homemaker
or the spouse.

The following relationships were tested:

a. the relationship between the age of youngest child
and the total amount of time spent for physical care of
family members,

b. the relationship between the age of youngest child
and amount of time spent for physical care of family mem-
bers by the homemaker,

c. the relationship between the age of youngest child
and amount of time spent for physical care of family
members by the spouse, and

d. the difference in the mean amount of time spent by
homemaker vs. the spouse for physical care of family members.

The mean amount of time spent for physical care of
family members by the homemaker ranged from six minutes
per day when the youngest child was 11-17 years to 288
minutes per day when the youngest child was under one year.

TABLE 4:6   Mean Minutes Spent Per Day for Care of Family Members by 210 Two-Parent, Two-Child Oregon Families by Age of Youngest Child

Age of Youngest Child	Physical Care		Nonphysical Care	
	Homemaker	Spouse	Homemaker	Spouse
Under 1	288	44	144	100
1	198	25	97	49
2-5	90	15	60	31
6-11	25	8	56	17
12-17	6	1	27	10
TOTAL	121.4	18.6	76.8	41.4

When the physical care was performed by the spouse, the mean amount of time ranged from one minute when the youngest child was 11-17 years to 44 minutes when the youngest child was under one year (see Table 4:6).

When controlled by the age of youngest child, the mean amount of time spent for physical care of family members by the homemaker was 121.4 minutes per day. When the physical care was performed by the spouse, the mean amount of time was 18.6 minutes per day (see Table 4:6).

The results of regression analysis are presented in Table 4:7. The total amount of time spent for physical care of family members was negatively correlated to the age of youngest child. The correlation coefficient was -.62 indicating a high correlation. A regression was run to find the magnitude of relationship. It showed the explained variance (R^2) to be .22, i.e., twenty two percent of the variance in total amount of time spent for physical care of family members was explained by the age of youngest child.

TABLE 4:7 Regression Results, Total Amount of Time Spent for Physical Care by the Age of Youngest Child

Variable	b	Standard Error	F-value (Significance Level)	
Age of youngest child	-24.9	3.88	41.39	(.000)
(Constant)	277.5	17.85	241.83	(.000)

R^2 = .22

An Analysis of Variance was used to test the relation-
ship between the age of youngest child and the total amount
of time spent for physical care of family members. The
F-statistic was 41.39 with .000 significance level.

The amount of time spent for physical care was closely
related to the age of youngest child when the physical care
was performed by the homemaker. The correlation coefficients
for time use of homemaker and spouse for physical care of
family members and the age of youngest child was -.62 for
the homemaker and -.27 for the spouse. The explained
variance (R^2) was .37 for the homemaker's time and .07 for
the spouse's time. This indicated that 37 percent of the
variance in the amount of time spent for physical care of
family members was explained by the age of youngest child
when the physical care tasks were performed by the homemaker.
However, when the physical care tasks were performed by the
spouse, only seven percent of the variance in the amount of
time spent for physical care of family members was explained
by age of youngest child.

The time spent for physical care of family members by
the homemaker and the spouse was positively correlated when
controlled by the age of youngest child. However, the
t-statistic of 5.43 showed that the difference between
homemaker's and spouse's time use was significant ($P < .10$).

A two-tailed t-test was run to find the difference

between the mean amount of time spent by homemaker and the spouse for physical care of family members without being controlled by the age of youngest child. The mean amount of time spent for physical care of family members by the homemaker was 74.91 minutes per day, while in the case of the spouse it was 13.45 minutes per day. The t-value of 7.18 indicated that the difference between mean amount of time spent by the homemaker and the spouse was highly significant (P = .000).

The significance of the above tests showed that the probability was smaller than .10, therefore, the null hypothesis was rejected. In terms of the research hypotheses, the results of the study provided evidence of highly significant relationships between the total amount of time spent for physical care of family members and the age of youngest child. Furthermore, the amount of time spent for physical care of family members was significantly different between homemaker and spouse with or without being controlled by the age of youngest child.

H_o2. There is no significant difference in the total amount of time spent for nonphysical care of family members

    a. by the age of youngest child, and

    b. whether nonphysical care is performed by homemaker or the spouse.

The following relationships were tested:

a. the relationship between the age of youngest child and the total amount of time spent for nonphysical care of family members,

b. the relationship between the age of youngest child and the amount of time spent for nonphysical care of family members by the homemaker,

c. the relationship between the age of youngest child and the amount of time spent for nonphysical care of family members by the spouse, and

d. the difference in the mean amount of time spent by homemaker vs. the spouse in nonphysical care of family members.

The mean amount of time spent for nonphysical care of family members by the homemaker ranged from 27 minutes per day when the youngest child was 11-17 years to 144 minutes per day when the youngest child was under one year. When the nonphysical care was performed by the spouse, the mean amount of time ranged from 10 minutes per day when the youngest child was 11-17 years to 100 minutes per day when the youngest child was under one year (see Table 4:6, p.61).

When controlled by the age of youngest child, the mean amount of time spent for nonphysical care of family members by the homemaker was 76.8 minutes per day. When the non-physical care tasks were performed by the spouse, the mean amount of time was 41.4 minutes per day (see Table 4:6).

The results of regression analysis are presented in Table 4:8. The total amount of time spent for nonphysical care of family members was negatively correlated to the age of youngest child. The correlation coefficient was -.42. This coefficient was substantially low compared to the correlation coefficient (-.62) of physical care time. The regression showed the explained variance (R^2) to be .15, indicating 15 percent of the variance in total amount of time spent for nonphysical care of family members was explained by the age of youngest child.

TABLE 4:8   Regression Results, Total Amount of Time Spent for Nonphysical Care by Age of Youngest Child

Variable	b	Standard Error	F-value (Significance Level)	
Age of youngest child	-12.3	2.17	32.44	(.000)
(Constant)	202.2	14.52	193.96	(.000)

R^2 = .15

An Analysis of Variance was used to test the relationship between the total amount of time spent for nonphysical care of family members and the age of youngest child. The F-statistic was 32.44 indicating a high significance (P = .000).

The relationship between amount of time spent for nonphysical care of family members and the age of youngest

child was not as different between the homemaker and the spouse, as it was for physical care. The correlation coefficient for the nonphysical care of family members and the age of youngest child was -.39 for the homemaker and -.34 for the spouse. The explained variance (R^2) was .15 for the homemaker's time use and .12 for the spouse's time use. This indicated that when the nonphysical care tasks were performed by the homemaker, the age of youngest child explained 15 percent of the variance in the amount of time spent for nonphysical care of family members. When the nonphysical care tasks were performed by the spouse, the age of youngest child explained 12 percent of the variance in the amount of time spent for nonphysical care of family members.

The time spent for nonphysical care of family members by the homemaker and the spouse was positively correlated by the age of youngest child. The t-test of difference between two correlated coefficients for correlated samples gave the t-value of 0.82, indicating that the difference between homemaker's and the spouse's time use for nonphysical care of family members was not significant ($P > .10$).

A two-tailed t-test was run to find the difference between the mean amount of time spent for nonphysical care of family members by the homemaker and the spouse without being controlled by the age of youngest child. The mean amount of time spent by the homemaker was 61.34 minutes

per day, and for the spouse it was 28.51 minutes per day. The t-value of 5.13 indicated that the difference between mean amount of time spent for nonphysical care of family members by the homemaker and the spouse was highly significant (P =.000).

The significance of the above tests showed that probability was smaller than .10, therefore, null hypothesis (H_o2) was rejected. In terms of the research hypothesis the results of this study provided evidence of a highly significant relationship between the total amount of time spent for nonphysical care of family members and the age of youngest child. However, the amount of time spent for nonphysical care of family members was found to be significantly different between the homemaker and the spouse only when it was not controlled by the age of youngest child.

The total amount of time spent for care of family members was approximately the same for physical care and nonphysical care. The mean minutes spent for physical care of family members was 88.36 minutes per day and the mean amount of time spent for nonphysical care of family members was 89.86 minutes per day (see Table 4:9).

TABLE 4:9 Mean Minutes Spent Per Day for Care of Family Members in Oregon Two-Parent, Two-Child Families

	Physical Care	Nonphysical Care
Homemaker	74.91	61.34
Spouse	13.45	28.51
TOTAL	88.36	89.86

$H_o 3$. There are no linear relationships between the amount of time spent for physical care of family members by the homemaker and:

 a. Age of youngest child

 b. Age of oldest child

 c. Age of homemaker

 d. Education of homemaker

 e. Education of spouse

 f. Occupation of homemaker

 g. Occupation of spouse

 h. Number of hours employed by homemaker

 i. Family income

 j. Whether family residence is urban or rural.

The results of multiple regression analysis are presented in Table 4:10. The explained variance (R^2) was .42. This indicated that the chosen set of independent variables explained 42 percent of the variance in the amount of time spent for physical care of family members by the homemaker. An analysis of variance test gave an F-value of 13.18 indicating a high significance (P = .000) for the full regression model.

The individual independent variables found to be significant (P < .10) in the regression were age of oldest child (P = .006), age of youngest child (P = .033), and age of homemaker (P = .06). The ages of children had negative relationships to the amount of time spent for

TABLE 4:10   Regression Results, Homemaker's Physical Care Time:
             Full Model

Variable	b	Standard Error	F-value (Significance Level)	
Age of youngest child	-8.45	3.95	4.58	(.033)
Age of oldest child	-10.96	3.95	7.70	(.006)
Age of homemaker	2.91	1.54	3.58	(.060)
Education of homemaker	1.42	3.79	.14	(.700)
Education of spouse	-.83	3.75	.05	(.82)
Occupation of homemaker	-7.01	5.95	1.39	(.24)
Occupation of spouse	-3.69	7.37	.25	(.62)
Number of hours employed by homemaker	3.50	4.49	.60	(.44)
IVARH[13]	-242.61	334.27	.53	(.41)
Family income	2.61	4.95	.27	(.60)
Residence (urban/rural)	-18.64	13.59	1.88	(.17)
(Constant)	45.5	146.34	.09	(.76)

R^2 = .42   Overall F 13.18   (.000)

13.   IVARH is part of number of hours employed by homemaker.

physical care of family members by the homemaker. As the
ages of children increased, the amount of time spent for
physical care of family members by the homemaker decreased.
The age of homemaker had a positive relationship. This
indicated that as the age of homemaker increased, the
amount of time spent for physical care of family members
by the homemaker also increased.

The results of stepwise regression are presented in
Table 4:11. The set of variables found to be significant
for best prediction of the homemaker's physical care time
were age of oldest child, age of youngest child, and age
of homemaker. These three variables explained approximately
95 percent of the variance accounted for by ten variables
in the full regression model (R^2 = .40).

TABLE 4:11   Regression Results, Homemaker's Physical Care
             Time: Stepwise Model (.10 Inclusion Level)

Variable	b	Standard Error	F-value (Significance Level)	
Age of oldest Child	-10.59	3.89	7.40	(.007)
Age of youngest Child	-9.05	3.84	5.55	(.019)
Age of homemaker	2.94	1.4	4.22	(.041)
(Constant)	148.03	40.84	13.14	(.000)

R^2 = .40   Overall F 47.51 (.000)

The test of significance for the overall model showed that the probability was smaller than .10, therefore, the null hypothesis (H_o3) was rejected. In terms of the research hypothesis, the results of this study provided evidence of a highly significant linear relationship between the amount of time spent for physical care of family members by the homemaker and the chosen set of independent variables. But when individual independent variables were identified for their significance and a set of best predicting variables were chosen, the result provided evidence of only three variables (age of oldest child, age of youngest child, and age of homemaker) to have significant relationship to the amount of time spent for physical care of family members by the homemaker.

The results of multiple regression analysis (second approach) are presented in Table 4:12. The explained variance (R^2) was .47. The analysis of variance test gave F-value of 6.78 indicating a high significance (P = .000) for the full regression model.

The individual independent variables found to be significant (P < .10) in the regression were age of oldest child (P = .020), age of youngest child (P = .030), and family residence (P = .082). The ages of children had negative relationships to the amount of time spent for physical care of family members by the homemaker. Family residence (urban/rural) also had a negative relationship.

TABLE 4:12   Regression Results, Homemaker's Physical Care Time:
Full Model (Second Approach)

Variable	b	Standard Error	F-value (Significance Level)	
Age of youngest child	-8.84	4.03	4.80	(.030)
Age of oldest child	-9.47	4.04	5.50	(.020)
Age of homemaker	2.45	1.70	2.08	(.15)
Education of homemaker				
Indicator 1	20.85	56.63	.13	(.71)
Indicator 2	-37.15	34.25	1.18	(.28)
Indicator 3	-15.96	16.94	.89	(.35)
Indicator 4	-4.44	33.33	.02	(.89)
Indicator 5	6.72	17.62	.15	(.70)
Indicator 6	10.97	21.58	.25	(.61)
Education of spouse				
Indicator 1	.84	11.42	.005	(.94)
Indicator 2	-2.56	19.51	.02	(.89)
Indicator 3	-35.33	30.35	1.35	(.25)
Indicator 4	53.62	19.90	7.26	(.008)
Indicator 5	-3.11	44.05	.005	(.94)
Indicator 6	-1.47	18.34	.006	(.94)
Indicator 7	-4.92	25.61	.04	(.85)
Indicator 8	-35.42	78.89	.20	(.65)
Occupation of homemaker				
Indicator 1	16.45	16.95	.94	(.33)
Indicator 2	23.56	18.15	1.69	(.19)
Indicator 3	3.80	16.83	.05	(.82)
Occupation of spouse				
Indicator 1	.84	11.42	.005	(.94)
Indicator 2	14.64	14.65	.10	(.32)
Number of hours employed by homemaker	.60	.76	.64	(.42)
Family income	.0004	.0006	.32	(.57)
Residence (urban/rural)	-25.26	14.43	3.06	(.082)
(Constant)	145.06	57.08	6.46	(.012)

$R^2 = .47$ Overall F 6.78 (.000)

Since urban residence was assigned the value of zero and rural residence was assigned value of one, the negative relationship indicated that the amount of time spent for physical care of family members by the homemaker was greater in the urban area than the rural area.

The results of stepwise regression (second approach) were the same as the results of stepwise regression (first approach).

H_o4. There are no linear relationships between the amount of time spent for nonphysical care of family members by the homemaker and:

    a. Age of youngest child

    b. Age of oldest child

    c. Age of homemaker

    d. Education of homemaker

    e. Education of spouse

    f. Occupation of homemaker

    g. Occupation of spouse

    h. Number of hours employed by homemaker

    i. Family income

    j. Whether family residence is urban or rural.

The results of multiple regression are presented in Table 4:13. The explained variance (R^2) was .18. This indicated that the chosen set of independent variables explained 18 percent of the variance in the amount of time

TABLE 4:13   Regression Results, Homemaker's Nonphysical Care
              Time: Full Model

Variable	b	Standard Error	F-value (Significance Level)	
Age of youngest child	-.57	2.87	.04	(.84)
Age of oldest child	-6.50	2.87	5.12	(.025)
Age of homemaker	1.68	1.12	2.24	(.13)
Education of homemaker	.31	2.75	.01	(.91)
Education of spouse	.33	2.73	.01	(.90)
Occupation of homemaker	-9.30	4.33	4.62	(.033)
Occupation of spouse	-.64	5.36	.01	(.90)
Number of hours employed by homemaker	-3.90	3.27	1.43	(.23)
IVARH[14]	237.97	243.01	.95	(.33)
Family income	.54	3.59	.02	(.88)
Residence (urban/rural)	-1.89	9.88	.03	(.85)
(Constant)	231.91	106.39	4.75	(.030)

R^2 = .18   Overall F 4.05 (.000)

14.   IVARH is part of number of hours employed by homemaker.

spent for nonphysical care of family members by the home-
maker. The analysis of variance test gave an F-value of
4.06 indicating the significance (P = .000) of the full
model.

The individual independent variables found to be signif-
icant (P< .10) in the regression were age of oldest child
(P = .025) and occupation of homemaker (P = .033). When
the age of oldest child was controlled, the age of youngest
child was found to be significant (P = .000) with an F-ratio
of 15.12. When the age of youngest child was controlled,
the F-ratio for the age of oldest child was 20.62
(P = .000). The age of oldest child had a negative rela-
tionship to the amount of time spent for nonphysical care
of family members by the homemaker. When the age of oldest
child was controlled, the age of youngest child was also
found to be negatively related to the amount of time spent
for nonphysical care of family members by the homemaker.
Occupation of the homemaker had a negative relationship to
her time for nonphysical care of family members. Occupation
was a categorical variable categorized and given ordinal
scales from lowest to highest as follows: 1 = homemaker,
none; 2 = service, labor, craft; 3 = clerical, sales;
4 = managerial, professional. The negative relationship
of homemaker's occupation to the amount of time she spends
for nonphysical care was interpreted as fulltime homemakers
spending more time for nonphysical care of family members

than the homemakers engaged in other occupations.

The results of stepwise regression are presented in Table 4:14. The set of variables found to be significant for best prediction of the homemaker's nonphysical care time were age of oldest child, occupation of homemaker, and age of homemaker. These three variables accounted for approximately 95 percent of the variance accounted for by ten variables in the full regression model (R^2 = .17). The age of homemaker had a positive relationship to the amount of time she spent for nonphysical care of family members.

TABLE 4:14   Regression Results, Homemaker's Nonphysical Care Time: Stepwise Model (.10 Inclusion Level)

Variable	b	Standard Error	F-value (Significance Level)	
Age of oldest child	-7.23	1.44	25.20	(.000)
Occupation of homemaker	-8.08	4.15	3.80	(.053)
Age of homemaker	1.73	1.03	2.82	(.095)
(Constant)	90.23	27.36	10.88	(.001)

R^2 = .17   Overall F 13.80 (.000)

The test of significance for the overall regression model showed that the probability was less than .10, therefore, null hypothesis (H_o4) was rejected. The results of this study provided evidence of a highly significant linear

relationship between the amount of time spent for nonphysical care of family members by the homemaker and the chosen set of independent variables as predicted in the research hypothesis of the present study. But when individual independent variables were identified for their significance and a set of best predicting variables were chosen, the result provided evidence of only three variables (age of oldest child, occupation of homemaker, and age of homemaker) to have significant relationship to the amount of time spent for nonphysical care of family members by the home-maker.

The results of multiple regression analysis (second approach) are presented in Table 4:15. The R^2 was .24. The analysis of variance test gave F-value of 2.40 and indicated the significance (P = .000) of the full regression model.

The individual independent variable found to be significant (P < .10) in the regression was age of oldest child (P = .042). When the age of oldest child was controlled, the age of youngest child was found to be significant with F-ratio of 8.82 (P = .003). When the age of youngest child was controlled, the F-ratio for the age of oldest child was 13.23 (P = .000).

The results of stepwise regression (second approach) are presented in Table 4:16. The set of variables found

TABLE 4:15 Regression Results, Homemaker's Nonphysical Care
Time: Full Model (Second Approach)

Variable	b	Standard Error	F-value (Significance Level)	
Age of youngest child	-.09	2.97	.001	(.97)
Age of oldest child	-6.08	2.97	4.19	(.042)
Age of homemaker	1.33	1.25	1.13	(.29)
Education of homemaker				
Indicator 1	-24.89	41.68	.36	(.55)
Indicator 2	27.32	25.21	1.17	(.28)
Indicator 3	-16.48	12.47	1.75	(.19)
Indicator 4	3.18	24.53	.02	(.90)
Indicator 5	-20.90	12.97	2.62	(.11)
Indicator 6	11.11	15.88	.49	(.48)
Education of spouse				
Indicator 1	-34.12	21.43	2.53	(.11)
Indicator 2	-2.21	14.36	.02	(.88)
Indicator 3	-2.42	22.34	.01	(.91)
Indicator 4	-3.74	14.65	.07	(.80)
Indicator 5	-25.56	32.43	.63	(.43)
Indicator 6	-11.64	13.50	.74	(.39)
Indicator 7	-31.57	18.84	2.81	(.096)
Indicator 8	88.20	58.06	2.31	(.13)
Occupation of homemaker				
Indicator 1	7.58	12.49	.37	(.55)
Indicator 2	18.38	13.36	1.89	(.17)
Indicator 3	-2.69	12.39	.05	(.83)
Occupation of spouse				
Indicator 1	1.64	8.41	.04	(.85)
Indicator 2	3.18	10.78	.09	(.77)
Number of hours employed byhomemaker	-.20	.56	.13	(.73)
Family income	-.0001	.0005	.07	(.79)
Residence (urban/rural)	-1.01	10.63	.009	(.92)
(Constant)	99.98	42.01	5.66	(.018)

R^2 = .24   Overall F 2.40 (.000)

to be significant (P =.10) for best prediction of home-
maker's nonphysical care time were age of oldest child,
number of hours employed by the homemaker, and age of home-
maker. These three variables accounted for approximately
67 percent of the variance accounted for by ten variables
in the full model (R^2 = .16). Number of hours employed by
the homemaker had a negative relationship to the amount of
time spent for nonphysical care of family members by the
homemaker. As the number of hours employed by the homemaker
increased, the amount of time spent for nonphysical care of
family members by the homemaker decreased.

TABLE 4:16   Regression Results, Homemaker's Nonphysical
Care Time: Stepwise Model (Second Approach)

Variable	b	Standard Error	F-value (Significance Level)	
Age of oldest child	-7.20	1.45	24.69	(.000)
Hours employed by homemaker	-.54	.32	2.85	(.000)
Age of homemaker	1.7	1.0	2.77	(.000)
(Constant)	80.49	27.7	8.43	(.004)

R^2 = .16   Overall F 13.43 (.000)

$H_o 5$. There are no linear relationships between the
amount of time spent for physical care of family members
by the spouse and:

    a. Age of youngest child

b. Age of oldest child

c. Age of spouse

d. Education of spouse

e. Education of homemaker

f. Occupation of spouse

g. Occupation of homemaker

h. Number of hours employed by spouse

i. Number of hours employed by homemaker

j. Family income

k. Whether family residence is urban or rural.

The results of multiple regression are presented in
Table 4:17. The explained variance (R^2) was .11. This
indicated that only 11 percent of the variance in the amount
of time spent for physical care of family members by the
spouse was explained by the chosen set of independent
variables. The analysis of variance test gave an overall
F-ratio of 1.90 indicating the significance at .032 level.

The individual independent variables found to be
significant in the regression were age of oldest child
(P = .035), and family residence (P = .054). When the age
of oldest child was controlled, the age of youngest child
was significant (P = .000) with F-ratio of 8.3. When the
age of youngest child was controlled, age of oldest child
was significant at .000 level with F-ratio of 12.97. The
age of oldest child had a negative relationship to the

TABLE 4:17   Regression Results, Spouse's Physical Care Time:
             Full Model

Variable	b	Standard Error	F-value (Significance Level)
Age of youngest child	.41	1.63	.06 (.80)
Age of oldest child	-3.37	1.59	4.50 (.035)
Age of spouse	.59	.58	1.01 (.32)
Education of spouse	.26	1.53	.03 (.87)
Education of homemaker	-.20	1.54	.01 (.90)
Occupation of spouse	-2.54	3.15	.65 (.42)
Occupation of homemaker	-.40	2.45	.03 (.87)
Number of hours employed by spouse	-.62	.73	.007 (.93)
IVARS[15]	3.30	34.14	.009 (.92)
Number of hours employed by homemaker	1.69	1.84	.85 (.36)
IVARH[16]	-109.55	136.90	.64 (.43)
Family income	.55	2.01	.07 (.78)
Residence (urban/rural)	-10.73	5.54	3.75 (.054)
(Constant)	-25.07	72.91	.12 (.73)

R^2 = .11   Overall F 1.90 (.032)

15. IVARS is part of number of hours employed by spouse.
16. IVARH is part of number of hours employed by homemaker.

spouse's physical care time. When the age of oldest child was controlled, the age of youngest child also had a negative relationship to the spouse's physical care time. The family residence had a negative relationship to the amount of time spent for physical care of family members by the spouse. Since urban residence was assigned the value of zero and rural residence was assigned value of one, the negative relationship indicated that the amount of time spent for physical care of family members by the spouse was greater in urban area than the rural area.

The results of stepwise regression are presented in Table 4:18. The set of variables found to be significant for best prediction of spouse's physical care time were age of oldest child and family residence. These two variables accounted for about 90 percent of the variance accounted for by the eleven variables in the full model (R^2 = .10).

TABLE 4:18 Regression Results, Spouse's Physical Care Time: Stepwise Model (.10 Inclusion Level)

Variable	b	Standard Error	F-value (Significance Level)	
Age of oldest child	-2.33	.56	17.09	(.000)
Family residence	-10.20	5.15	3.92	(.049)
(Constant)	42.37	6.60	41.16	(.000)

R^2 = .10   Overall F 11.38 (.000)

The test of significance for the overall regression model showed that probability was less than .10, therefore, null hypothesis (H_o5) was rejected. In terms of the research hypothesis, the results of this study provided evidence of a significant linear relationship between amount of time spent for physical care of family members by the spouse and the chosen set of independent variables. When individual independent variables were identified for their significance and a set of best predicting variables were chosen, the results provided evidence of only two variables (age oldest child and family residence) to have significant relationship to the amount of time spent for physical care of family members by the spouse.

The results of multiple regression (second approach) are presented in Table 4:19. The R^2 was .15. The analysis of variance test gave an overall F-ratio of 1.28 (P = .176) indicating no significance of the full model (P .10).

The individual independent variables found to be significant in the regression were age of oldest child (P = .021) and family residence (P = .029). When the age of oldest child was controlled, the age of youngest child was significant (P = .003) with F-ratio of 8.79. When the age of youngest child was controlled, the F-ratio for the age of oldest child was 14.33 (P = .000).

The results of stepwise regression (second approach) were the same as the results of stepwise regression (first

TABLE 4:19   Regression Results, Spouse's Physical Care Time:
              Full Model (Second Approach)

Variable	b	Standard Error	F-value (Significance Level)	
Age of youngest child	.68	1.70	.16	(.70)
Age of oldest child	-3.90	1.67	5.43	(.021)
Age of spouse	.88	.64	1.90	(.17)
Education of spouse				
Indicator 1	-4.61	12.24	.14	(.71)
Indicator 2	-9.22	8.16	1.28	(.26)
Indicator 3	12.47	12.47	.10	(.32)
Indicator 4	12.90	8.17	2.49	(.12)
Indicator 5	14.95	18.65	.64	(.42)
Indicator 6	2.28	7.65	.09	(.77)
Indicator 7	-6.80	10.99	.38	(.54)
Indicator 8	-14.31	31.74	.20	(.65)
Education of homemaker				
Indicator 1	5.45	23.48	.05	(.82)
Indicator 2	-2.20	14.25	.02	(.88)
Indicator 3	1.54	6.95	.05	(.83)
Indicator 4	-5.64	13.94	.16	(.69)
Indicator 5	-2.40	7.37	.11	(.75)
Indicator 6	-2.86	8.95	.10	(.75)
Occupation of spouse				
Indicator 1	4.46	4.81	.86	(.35)
Indicator 2	-2.70	6.14	.19	(.66)
Occupation of homemaker				
Indicator 1	5.48	7.09	.60	(.44)
Indicator 2	-3.27	7.56	.19	(.67)
Indicator 3	3.56	7.16	.25	(.62)
Number of hours employed by spouse	.15	.22	.44	(.51)
Number of hours employed by homemaker	.25	.31	.64	(.42)
Family Income	.00008	.000)	.09	(.76)
Residence (urban/rural)	-13.60	6.19	4.82	(.029)
(Constant)	8.41	23.80	.12	(.72)

R^2 = .15   Overall F 1.28 (.176)

approach).

H_o6.   There are no linear relationships between the amount of time spent for nonphysical care of family members by the spouse and:

a. Age of youngest child

b. Age of oldest child

c. Age of spouse

d. Education of spouse

e. Education of homemaker

f. Occupation of spouse

g. Occupation of homemaker

h. Number of hours employed by spouse

i. Number of hours employed by homemaker

j. Family income

k. Whether family residence is urban or rural.

The results of multiple regression are presented in Table 4:20. The explained variance (R^2) was .15. This indicated that 15 percent of the variance in amount of time spent for nonphysical care of family members by the spouse was explained by the chosen set of independent variables. The analysis of variance test gave an overall F-value of 2.73 indicating the significance (P = .001) of the full model.

The individual independent variable found to be significant in the regression was age of oldest child (P = .031).

TABLE 4:20   Regression Results, Spouse's Nonphysical Care Time:
             Full Model

Variable	b	Standard Error	F-value (Significance Level)
Age of youngest child	.12	2.33	.002 (.96)
Age of oldest child	-4.93	2.27	4.70 (.031)
Age of spouse	.70	.83	.72 (.40)
Education of spouse	-2.76	2.18	1.60 (.21)
Education of homemaker	2.97	2.20	1.81 (.18)
Occupation of spouse	.70	4.49	.02 (.88)
Occupation of homemaker	-4.92	3.49	1.99 (.16)
Number of hours employed by spouse	.15	1.04	.02 (.88)
IVARS[17]	8.73	48.76	.03 (.86)
Number of hours employed by homemaker	2.96	2.19	.04 (.83)
IVARH[18]	35.25	195.49	.03 (.86)
Family income	1.19	2.87	.17 (.68)
Residence (urban/rural)	-4.94	7.91	.39 (.53)
(Constant)	45.27	104.12	.19 (.66)

R^2 = .15   Overall F 2.73 (.001)

17. IVARS is part of number of hours employed by spouse.
18. IVARH is part of number of hours employed by homemaker.

When the age of oldest child was controlled, the age of youngest child was found to be significant at .001 level with F-ratio of 11.11. When the age of youngest child was controlled, the age of oldest child was significant at .000 level with F-value of 16.10. The age of oldest child had a negative relationship to the amount of time spent for nonphysical care of family members by the spouse. When the age of oldest child was controlled, the age of youngest child also had a negative relationship to the spouse's nonphysical care time.

The results of stepwise regression are presented in Table 4:21. The only variable found to be significant ($P < .10$) for best prediction of spouse's nonphysical care time was age of oldest child. This variable alone accounted for about 87 percent of the variance accounted for by eleven variables in full model ($R^2 = .13$).

TABLE 4:21 Regression Results, Spouse's Nonphysical Care
Time: Stepwise Model (.10 Inclusion Level)

Variable	b	Standard Error	F-value (Significance Level)	
Age of oldest child	-4.47	.80	30.78	(.000)
(Constant)	74.17	9.01	67.71	(.000)

$R^2 = .13$ Overall F 30.78 (.000)

The test of significance for the overall regression model showed that probability was less than .10, therefore, null hypothesis (H_o6) was rejected. In terms of the research hypothesis, the results of this study provided evidence of a significant linear relationship between the amount of time spent for nonphysical care of family members by the spouse and the chosen set of independent variables. But when individual independent variables were identified for their significance and set of best predicting variables were chosen, the results provided evidence of only one variable (age of oldest child) to have significant relationship to the amount of time spent for nonphysical care of family members by the spouse.

The results of multiple regression (second approach) are presented in Table 4:22. The R^2 was .21. The analysis of variance gave an overall F-ratio of 1.88 indicating the significance of the full model (P = .009).

The only individual independent variable found to be significant in the regression was age of oldest child (P = .054). When the age of oldest child was controlled, the age of youngest child was found to be significant (P = .007) with F-ratio of 7.52. When the age of youngest child was controlled, the age of oldest child was significant at .001 level with F-ratio of 11.40.

The results of stepwise regression (second approach)

TABLE 4:22   Regression Results, Spouse's Nonphysical Care Time:
             Full Model (Second Approach)

Variable	b	Standard Error	F-value (Significance Level)
Age of youngest child	.46	2.40	.04 (.85)
Age of oldest child	-4.57	2.36	3.75 (.054)
Age of spouse	.73	.90	.64 (.42)
Education of spouse			
Indicator 1	2.64	17.29	.02 (.88)
Indicator 2	13.15	11.52	1.30 (.25)
Indicator 3	-7.97	17.61	.20 (.65)
Indicator 4	13.57	11.55	1.38 (.24)
Indicator 5	-3.46	26.33	.02 (.89)
Indicator 6	10.59	10.80	.96 (.33)
Indicator 7	10.63	15.53	.47 (.49)
Indicator 8	-33.51	44.82	.56 (.46)
Education of homemaker			
Indicator 1	-19.95	33.16	.36 (.55)
Indicator 2	10.95	20.13	.29 (.59)
Indicator 3	-24.24	9.81	6.11 (.014)
Indicator 4	1.87	19.69	.009 (.92)
Indicator 5	-9.24	10.40	.79 (.38)
Indicator 6	8.01	12.65	.40 (.53)
Occupation of spouse			
Indicator 1	9.26	6.79	1.86 (.17)
Indicator 2	-10.07	8.67	1.35 (.24)
Occupation of homemaker			
Indicator 1	3.07	10.01	.09 (.76)
Indicator 2	10.35	10.67	.94 (.33)
Indicator 3	1.54	10.12	.02 (.88)
Number of hours employed by spouse	.01	.32	.002 (.97)
Number of hours employed by homemaker	-.18	.44	.17 (.68)
Family income	.00003	.0004	.007 (.93)
Residence (urban/rural)	-4.04	8.74	.21 (.65)
(Constant)	45.44	33.62	1.83 (.18)

$R^2 = .21$ Overall F 1.88 (.009)

were the same as the results of stepwise regression (first approach).

A summary of results (of significant variables) for both the approaches is presented in Table 4:23. The results of the two approaches were not considerably different. The first approach is appropriate when the intent is to show the direction of relationship. However, the second approach is stronger when it is to be prediction.

TABLE 4:23   Summary of Significant Results for First Approach and Second Approach

Variable	Physical Care				Nonphysical Care			
	Homemaker		Spouse		Homemaker		Spouse	
	(First)	(Second)	(First)	(Second)	(First)	(Second)	(First)	(Second)
Age of youngest child	S	S	X	X	X	X	X	X
Age of oldest child	S	S	S	S	S	S	S	S
Age of homemaker	S	S	X	X	S	S	X	X
Occupation of homemaker	X	X	X	X	S	X	X	X
Hours employed by homemaker	X	X	X	X	X	S	X	X
Residence (urban/rural)	X	S	S	S	X	X	X	X
Full Model	S	S	S	X	S	S	S	S
Overall R^2	.42	.47	.11	.15	.18	.24	.15	.21

S = Significant result

X = Insignificant result

V.   SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

Summary

The purpose of this study was to analyze the use of
time for physical and nonphysical care of family members in
two-parent, two-child, rural and urban Oregon families.
The relationships of the amount of time spent for physical
and nonphysical care of family members to the independent
variables, age of youngest child, age of oldest child, age
of homemaker, age of spouse, education of homemaker, educa-
tion of spouse, occupation of homemaker, occupation of
spouse, hours employed by homemaker, hours employed by
spouse, family income, and family residence (urban/rural)
were analyzed using correlation, regression, and t-test.

The data used in the analysis had been collected from
210 two-parent, two-child Oregon families between January
and December 1977 as part of Interstate Urban/Rural Compar-
ison of Families' Time Use; a contributing project of the
Northeast Regional Research Project NE-113. Families from
rural areas lived in Linn and Benton counties. Families
from urban areas lived in the Portland Standard Metropolitan
Statistical Area. The 105 families sampled from each area
(urban/rural) were stratified into five groups according to
the age of youngest child. There were 21 families in each
stratum.

Since the sample was stratified and the sample observations were not proportional to the population, weights were used for respective strata to make a true estimate of the population mean.

The mean age for homemakers was 33 years ranging from 18 years to 54 years. For the spouse, the mean age was 35 years ranging from 20 years to 54 years. The education level completed by both the homemakers and the spouses was higher than the national average. More than two-thirds of the homemakers were fulltime homemakers. Only about 14 percent of the homemakers were gainfully employed for 30 hours or more per week. Ninety eight percent of the spouses were employed and all of them were employed for 30 hours or more per week. Both the employed homemakers and the employed spouses were in white collar occupations at a higher percentage than the national average. The families were largely representative of middle and higher income groups.

The mean amount of total time spent for care of family members was 2.97 hours per day. Of this, 2.27 hours was attributed to the homemaker and .7 hours could be attributed to the spouse. The mean amount of time spent for physical care of family members was 1.47 hours per day. The mean amount of time spent for nonphysical care of family members was 1.50 hours per day.

Significant relationships were found between the age of youngest child and the total amount of time spent for physical care and nonphysical care of family members by both the homemaker and the spouse and the amount of time spent for physical care by the homemaker. When the age of oldest child was controlled, the age of youngest child was found to be significantly related to the amount of time spent for nonphysical care by the homemaker and the amount of time spent for both physical and nonphysical care by the spouse. This might have resulted because of multicolinearity between the two independent variables, age of oldest child and age of youngest child (r = .93, see Appendix E). The negative relationship between age of youngest child and the amount of time spent for care of family members indicated that as the age of youngest child increased, the time spent for care of family members decreased. This finding was reasonable because children tend to demand less of care time as they grow older. This finding supported the findings of earlier studies (Wilson, 1929; Warren, 1940; Manning, 1968; Walker & Woods, 1976; Robinson, 1977).

The age of oldest child had significant negative relationships to the amount of time spent for care of family members by both the homemaker and the spouse. As the age of oldest child increased, the amount of time spent for care of family members decreased. This might have happened in two ways: the oldest child himself demanded less care

time as he grew older and/or as he grew older he helped his parents with care of younger sibling. Furthermore, as the age of the older child increased, so did the age of the younger child.

Age of the homemaker was found to have significant positive relationships to both the physical and nonphysical care time she spent for family members. The positive relationship was unexpected and was contradictory to earlier findings. In Manning's (1968) study, a negative relationship was found, therefore, it was expected that the age of homemaker would be a stand-in for age of the youngest child: the younger the homemaker, the younger the children with the homemaker spending more time for family care. But the result of this study showed that time spent for both physical and nonphysical care of family members increased as the age of the homemaker increased.

Occupation of the homemaker was found to have a significant negative relationship to the nonphysical care time of the homemaker. Since occupation was a categorical variable,[19] the negative relationship is indicative that fulltime homemakers spent more time for nonphysical care of family members than the homemakers who were engaged in other occupations.

---

19. Occupation variable was categorized and given ordinal scales from lowest to highest as follows: 1 = homemaker, none; 2 = service, labor, craft; 3 = clerical, sales; 4 = managerial, professional.

The number of hours employed by the homemaker had a significant negative relationship to the nonphysical care time of the homemaker. The negative relationship indicated that as the hours employed by the homemakers increased, the amount of time they spent for nonphysical care of family members decreased. This finding supported the findings of Walker and Woods (1976) and Robinson (1977). However, their findings reported a decrease in both physical and nonphysical care time with an increase in hours of employment. This finding was contradictory to Goldberg's (1977) finding. Goldberg reported that even though nonemployed mothers had more available contact time (nonphysical in nature) than the part-time employed or full-time employed mothers, they spent less time in direct contact with their preschoolers in comparision to the part-time or full-time employed mothers.

Family residence was found to be significantly related to the spouse's and the homemaker's physical care time. The urban couples were found to spent more time for physical care of family members than the rural couples. This finding supported the findings of earlier studies (Wilson, 1929; Robinson, 1977).

The analysis revealed that the total amounts of time spent for care of family members were about the same for both physical and nonphysical care. In Walker and Woods' (1976) study, the amount of time spent for physical care

was 47 percent and the amount of time spent for nonphysical care was 53 percent of the total amount of time spent for care of family members. The equal amount of time spent for both physical and nonphysical care might have resulted because of exclusion of secondary time in the present study.

The chosen set of independent variables explained 47 percent of the variance in the homemaker's physical care time (R^2 = .47) and 24 percent of the variance in the homemaker's nonphysical care time (R^2 = .24). However, the same set of independent variables explained only 15 percent of the variance in the spouse's physical care time (R^2 = .15) and 21 percent of the variance in the spouse's nonphysical care time (R^2 = .21).

Conclusions

Time use data has been used for testing a household utility maximization hypothesis. Since, infant care is not a marketable service (in an ethical and physical sense), the usual demand studies will fail in the absence of a price variable. On the other hand, the household-production function approach suffers due to lack of substitution possibilities between mother's time and market goods in producing a unit of quality child care.

The results of the study lead the investigator to conclude that care of family members in Oregon two-parent,

two-child families is most frequently performed by home-
makers. The homemakers spend nearly six times as much time
for physical care and twice as much time for nonphysical
care of family members as the spouse.

As the homemakers' hours of gainful employment
increased, time they spent for nonphysical care decreased.
However, there was no significant difference in the amount
of time spent for physical care of family members between
employed and nonemployed homemakers. Since almost half
of the children in the sample were under six years of age,
and younger children in the family tend to create demand
for more physical care time, the low incidence of employed
homemakers in the sample might be an influencing factor in
these results. The double time burden of homemaking and
employment could keep these women out of the job market.

In general, spouses in two-parent, two-child families
are more likely to help with nonphysical care of family
members than with physical care. However, the spouses in
urban areas spend more time for physical care of family
members than the spouses in rural areas. This could be
an indication that rural spouses are more traditional in
their sex role relating to the care of family, while urban
spouses are more flexible.

The ages of children are important factors in deter-
mining both the total amount of time and homemakers' and

spouses' time spent for care of family members. When there are younger children in the family, both the homemaker and the spouse spend more time for care of family members. As the children grow older, the time spent for care of family members decreases in two ways: (1) the children themselves demand less of care time as they grow older and (2) they tend to help their parents with care of their younger siblings as they grow older.

Equal amounts of time were spent for both physical and nonphysical care of family members in the present analysis. Since secondary time was excluded from the present analysis, the time actually used for nonphysical care of family members may be seriously understated.

The parental attributes (i.e., education, income etc.) have less importance than the ages of children in determining the amount of time spent for care of family members. With the number of children controlled, the socioeconomic characteristics of parents had no relationship with the amount of time spent for care of family members. Based on the results of the study, it is concluded that the time spent for care of family members is more related to demographic and behavioral variables than it is to socioeconomic variables.

The nonsignificance of socioeconomic variables lead the investigator to hypothesize that appropriate use of

categorical variables (such as aggregation of categorical variables into two or three categories instead of many categories as used in the present study) may show a significant difference in use of time among aggregated socioeconomic status groups. Another hypothesis that can be made for nonsignificance of socioeconomic variables is that in Oregon two-parent, two-child families the standards for childrearing are similar among different socioeconomic status groups. This might be the result of the developed nature of a country's socioeconomic conditions where parents have access to similar outside childrearing and child educating institutions and organizations (such as, public schools and television) regardless of their socioeconomic status. Furthermore, the homemakers have access to informal education for child rearing through mass media (such as, television, radio, and magazines).

The chosen set of independent variables explained 47 percent of the variance in the homemaker's physical care time. However, variances in the homemaker's nonphysical care time and the spouse's physical and nonphysical care time were explained very little by the chosen set of independent variables. This lead the investigator to conclude that lack of appropriate independent variables in the model caused such a result. The difference in time usage pattern for care of family members in Oregon two-parent, two-child

families could be attributed to other characteristics such as, parental attitudes, values, and behaviour.

Recommendations

The conclusions lead the investigator to recommend the development of a model that identifies independent variables which can explain the dependent variable. An investigation of the relationship of variables such as, families' attitudes, knowledge, behaviour, and values with time used for care of family members is recommended for future investigation. In addition to these, independent variables such as, sex of the oldest child, day of the week, presence of consumer durables, spouse's occupational demand for time and energy are recommended for future investigation.

The aggregation of categorical variables into two or three categories rather than many categories as used in the present study is also recommended for future investigation.

The analysis of time spent for care of family members provided results for that time which was related to the care of family members only. Though the overall time spent for care of family members is known, the magnitude of the total amount of time spent for care of family members in relation to the amount of time spent for total household activities is not known. This is recommended for future investigation. The knowledge of the proportion of time spent for care of family members in relation to the total household activities

helps in comparing time-use pattern over different time-periods, different geographic areas, and different family compositions.

It was concluded that the equal amount of time spent for both physical and nonphysical care of family members in the present analysis may be the result of exclusion of secondary time (used for care of family members) in the present study. Inclusion of secondary time used for care of family members is recommended for future investigation. This will give more accurate estimate of the actual amount of time spent for care of family members.

In the review of the literature, it was reported that children are time-intensive during their infancy and become goods-intensive as grow older. When the children become goods-intensive, the family income could become a significant factor in determining the amount of time spent for care of family members. An investigation of this relationship is recommended. The relationship can be tested by partitioning the data by the age of youngest child and using only those families where the youngest child is a preschooler or older.

In the review of the literature, it was also reported that time spent for care of children was found to be closely related to the children's future achievements. In the present study, time spent exclusively for children

was not accounted for. This is recommended for future investigation. Furthermore, a longitudinal study of these families would provide the answers for the much discussed relationship between children's achievemant or success in adult life and the amount of time spent for their care.

BIBLIOGRAPHY

Becker, Gary. An Economic Analysis of Fertility. In
     National Bureau of Economic Research, Demographic and
     Economic Change in Developed Countries. New York:
     Princeton, 1960.

Bernard, Jessie. Women, Wives, Mothers: Values and Options.
     Chicago: Aldine Publishers, 1975.

Bivens, Gordon E. The Grants Economy and Study of the
     American Family: A Possible Framework for Trans-Disci-
     plinary Approaches. Home Economics Research Journal,
     1976, 5(2), 70-78.

Blake, Judith. Are Babies Consumer Durables? A Critique of
     Economic Theory of Reproductive Motivation. Population
     Studies, March 1968, 22(1), 5-25.

Boulding, Kenneth; Pfaff, Martin & Hovarth, Janos. Grants
     Economics: A Simple Introduction. The American Economist,
     Spring 1972, XVI(1), 19-27.

Clark, Colin. The Economics of Housework. Bulletin of
     Oxford University of Statistics, 20 May 1978, 205-211.

Clark, Robert Alan. Husbands' Work Time: Relationship to
     Family Role Sharing, Husbands' Role Competence, and Wives'
     Employment (Doctoral Dissertation, Washington State
     University, 1976). Dissertation Abstract International,
     1977, 37(8-A) 5385, Order No. 77-2856.

DeTray, Dannis N. Child Quality and the Demand for Child-
     ren. Journal of Political Economy, March/April 1973,
     81(2), S70-S95.

Fethke, Carol & Hauserman, Nancy R. Homemaking: The Invi-
     sible Occupation. Journal of Home Economics, Summer 1979,
     71(2), 322-330.

Fleisher, Belton M. Mothers' Home Time and the Production
     of Child Quality. Demography, May 1977, 14(2), 197-212.

Fuchs, Victor R. Recent Trends and Long Run Prospects of
     Female Earnings. The American Economic Review, May 1974,
     LXIV(2), 236-242.

Goldberg, Roberta J. Maternal Time Use and Preschool
    Performance (Doctoral Dissertation, University of
    Minnesots, 1977). Dissertation Abstract International,
    1977, 38(3-A) 1287, Order No.77-18-990.

Gough, Kathleen. The Origin of Family. In Arlene Skolnick
    and Jerome Skolnick (Eds.), Family in Transition
    (2nd ed.). Boston: Little, Brown & Company, 1977.

Gronau, Reuben. The Allocation of Time of Israeli Women.
    Journal of Political Economy, August 1976, 84(4),
    S201-S220.

Gronau, Reuben. The Effect of Children on the Housewife's
    Value of Time. Journal of Political Economy, March/April
    1973, 81(2), S168-S199.

Gronau, Reuben. Leisure, Home Production, and Work - The
    Theory of Allocation of Time Revisited. Journal of
    Political Economy, December 1977, 85(6), 1099-1123.

Hayghe, Howard. Families and the Rise of Working Wives - An
    Overview. Monthly Labor Review, May 1976, 99(5), 12-19.

Hill, C. Russell & Stafford, Frank P. Time Inputs to
    Children. In James N. Morgan (Ed.), Five Thousand
    American Families - Patterns of Economic Progress,
    Michigan: Ann Arbor, 1974a.

Hill, C. Russell & Stafford, Frank P. Allocation of Time
    to Preschool Children and Educational Opportunity.
    Journal of Human Resources, Summer 1974b, IX(3), 323-341.

Hill, C. Russell & Stafford, Frank P. Parental Care of
    Children: Time Diary Estimate of Quality, Predictability,
    and Variety. Journal of Human Resources, Spring 1980,
    XV(2), 219-239.

Hoffman, Lois W. The Employment of Women: Education, and
    Fertility. Merrill-Palmer Quarterly, April 1974, 20(2),
    71-98.

Kamerman, Seila B. Work and Family in Industrialized Society.
    Signs, Summer 1979, 4(4), 632-650.

Kerlinger, Fred N. Foundations of Behavioral Research
    (2nd ed.). New York: Holt, Renehart & Winston, Inc.,
   1973.

Leibowitz, Arleen. Parental Inputs and Children's Achievement. _Journal of Human Resources_, Spring 1977, _XII_(2), 242-250.

Leichter, Hope J. Some Perspectives on the Family as Educator. _Teachers College Records_, Columbia University, December 1974, _76_(2), 175-217.

Lindert, Peter H. Sibling Position and Achievement. _Journal of Human Resources_, Spring 1977, _XII_(2), 198-219.

Lopata, Helena-Znaneicki. _Occupation: Housewife_. New York: Oxford University Press, 1961.

Lopate, Carol. Pay For Housework? _Social Policy_, Setember/ October 1974, _5_(3), 27-31.

Manning, Sarah L. _Time Use in Household Tasks by Indiana Families_. Research Bulletin No.837, Purdue University Agricultural Experiment Station Project No.1169.

Marx, Karl. On Family Life Under the Factory System. In Arlene Skolnick & Jerome Skolnick (Eds.), _Family in Transition_. Boston: Little, Brown & Company, 1977.

Miller, Delbert C. _Handbook of Research Design and Social Measurement_. New York: David McKay Company, Inc., 1974.

Mincer, Jacob & Polachek, Solomon. Family Investment in Human Capital: Earnings of Women. _Journal of Political Economy_, March/April 1974, _82_(2), part II, S76-S108.

Morgan, James N.; Sirageldin, Ismail A. & Baerwaldt, Nancy. _Productive American_. Michigan: Ann Arbor, 1966.

Moock, Peter R. Economic Aspects of the Family As Educator. _Teachers College Record_, Columbia University, December 1974, _76_(2), 266-278.

Neimi, Albert W. (JR.). The Impact of Children on Female Earnings. _Journal of Comparative Family Studies_, Spring 1978, _9_(1), 83-91.

Nye, F. Ivan. Adjustment to Children. In F.Ivan Nye & Lois W. Hoffman (Eds.), _The Employed Mother in America_. Chicago: Rand McNally, 1963.

Parker, Louise A. Shared Family Time: An Analysis in Two-Parent, Two-Child Oregon Households. Unpublished Master Thesis, Oregon State University, 1979.

Robinson, John P. How Americans Use Time: A Social-Psychological Analysis of Everyday Behaviour. New York: Prager Publishers, 1977.

Robinson, John P.; Converse, Philip E. & Szalai, Alexander. Everyday Life in Twelve Countries. In Alexander Szalai (Ed.), The Use of Time: Daily Activities of Urban and Suburban Population in Twelve Countries. Hague: Mouton, 1972.

Schultz, Theodore W. The High Value of Human Time: Population Equilibrium. Journal of Political Economy, March/April 1974, 82(2), S2-S10.

Schultz, Theodore W. The Value of Children: An Economic Perspective. Journal of Political Economy, March/April 1973, 81(2), S2-S13.

Snedecor, George W. & Cochran William G. Statistical Methods (6th ed.). Iowa: Iowa State University Press, 1978.

Social Accounting for Oregon, 1977: Socioeconomic Indicator. State of Oregon Human Resources, Salem: State Community Services Program, 1978.

Statistical Abstract, 1978 (99th ed.). U.S. Department of Commerce, Bureau of Census.

Statistical Abstract, 1979 (100th ed.). U.S. Department of Commerce, Bureau of Census.

Stone, Philip J. Child Care in Twelve Countries. In Alexander Szalai (Ed.), The Use of Time: Daily Activities of Urban and Suburban Population in Twelve Countries. Hague: Mouton, 1972.

√ Szalai, Alexander. Women's Time - Women in the Light of Contemporary Time-Budget Research. Futures, October 1975, 7(5), 385-399.

√ Szinovacz, Maximiliance. Women Employed: Effects on Spouses' Division of Household Work. Journal of Home Economics, Summer, 1979, 71(2), 42-45.

Thornton, Arland. Fertility and Income, Consumption Aspirations, and Child Quality Standards. <u>Demography</u>, May 1979, <u>16</u>(2), 157-175.

✓Vanek, Joann. Time Spent in Housework. <u>Scientific American</u>, November 1974, 116-120.

Vanek, Joann. Variation in a Sixty Hour Week - Trends in Women's Time in Work in the USA. <u>Ekistics</u>, July 1975, <u>236</u>, 37-39.

Waerness, Kari. The Invisible Welfare State: Women's Work at Home. <u>Acta Sociologica</u>, 1978 (Supplement), <u>21</u>, 193-207.

Walker, Kathryn E. Household Work Time: Its Implication for Family Decisions. <u>Journal of Home Economics</u>, October 1973, <u>65</u>(8), 7-11.

✓Walker, Kathryn E. Time Use by Husbands for Household Work. <u>Family Economic Review</u>, June 1970, 8-11.

✓Walker, Kathryn E. & Woods, Margaret E. <u>Time Use: A Measure of Household Production of Family Goods and Services</u>. Washington D.C.: American Home Economic Association, 1976.

✓Warren, Jean. <u>Use of Time in its Relation to Home Management</u>. Cornell University Agricultural Experiment Station, Ithaca, New York. Bulletin No.734, June 1940.

Wilson, Maud. <u>Use of Time by Oregon Farm Homemakers</u>. Agricultural Experiment Station, Oregon State Agricultural College, Corvallis, November 1929.
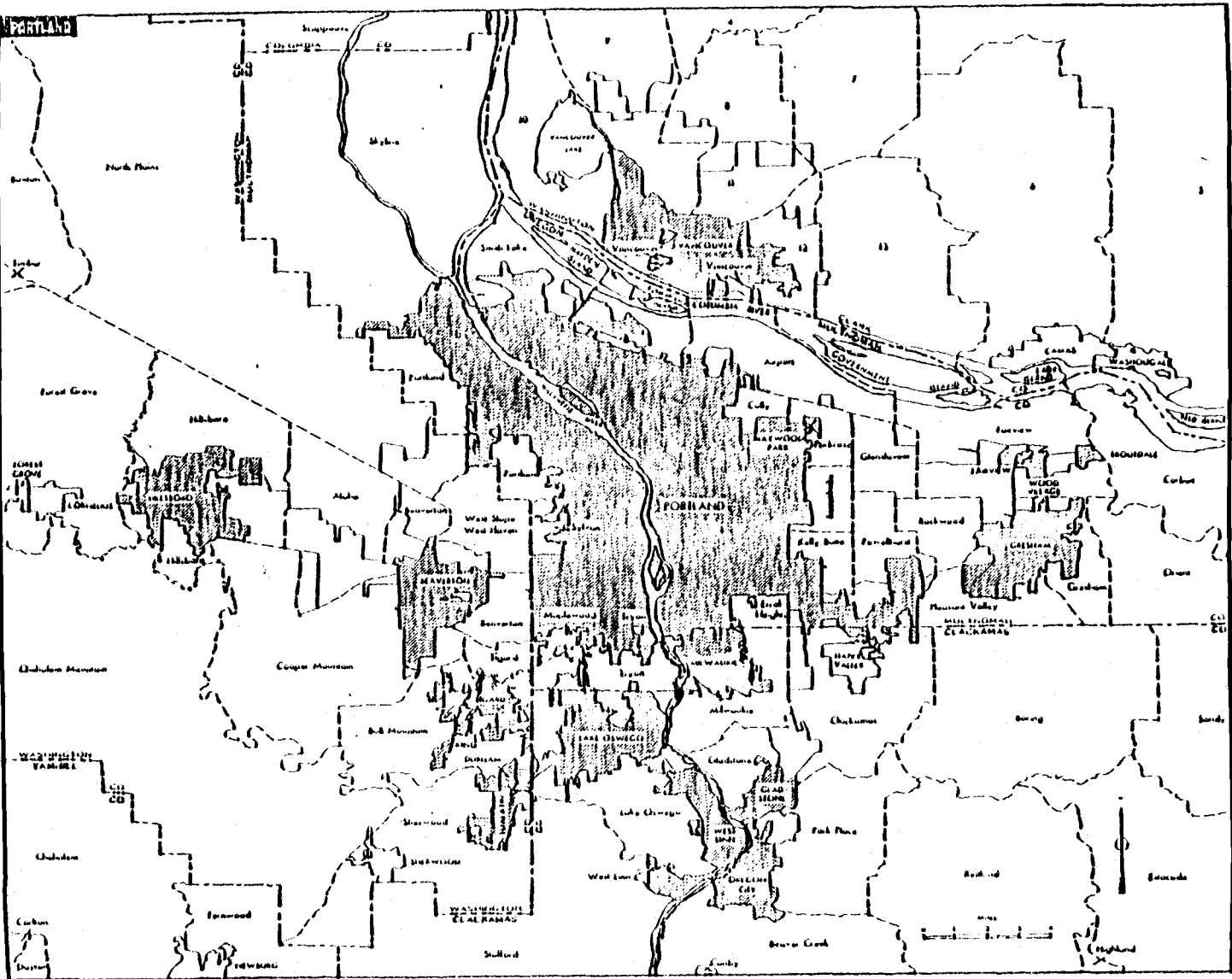
APPENDICES
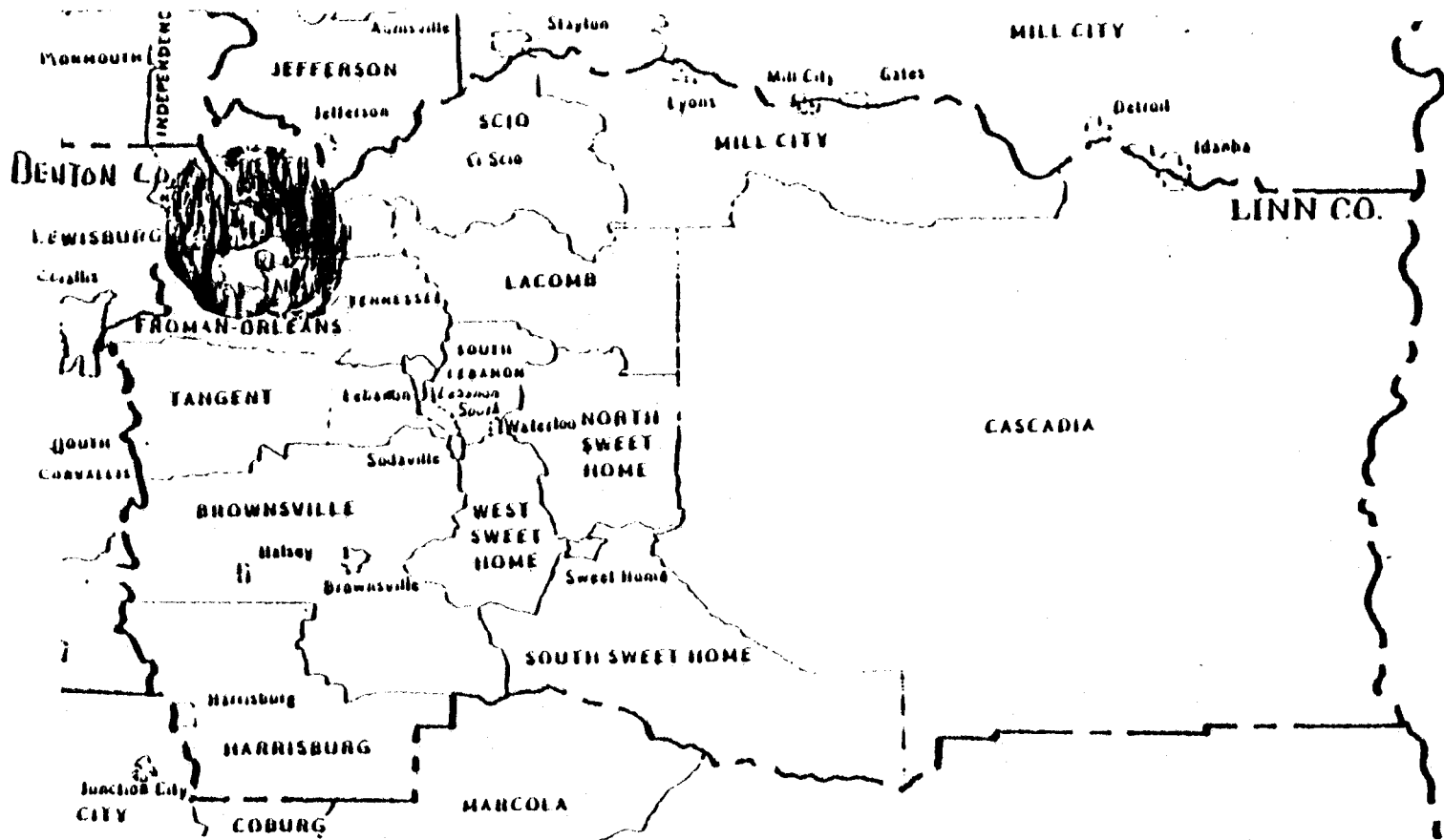
APPENDIX B

Map of Urban Sampling Area - Portland Metropolitan
Statistical Area - Oregon.

APPENDIX C

Letter to Participants

School of
Home Economics

Oregon State University

Corvallis, Oregon 97331　(503) 754-5561

January 17, 1977

Dear Mr. and Mrs.

A time-use research project is being conducted by the Family Resource
Management Department within the School of Home Economics at Oregon
State University. The Oregon study is part of a nationwide research
project coordinated by Cornell University in New York State. The fo-
cus of the research is on family members and how they use their time,
both in work and nonwork activities. We are interested in understand-
ing more about the time-use problems of families today as well as com-
paring families today with Oregon families' time use in the late 1920's.
This is possible because of an early research study done by Maud Wil-
son, a pioneer researcher from Oregon State University who was recog-
nized nationally for her work.

Your help is very much needed for the completion of this project.
Your name has been drawn by chance to represent the size and age com-
position of families we need to study. The information we are re-
questing is not personal in nature. The information you give us will
be used for no purpose other than the research and your family will
not be identified in any way. In addition to providing valuable data
to us, we hope that your participation will be beneficial to you as
we work with you to determine where your valuable time goes.

A member of the research team will contact you within the week to
arrange a convenient time to talk with you. Please ask any questions
you may have about your participation in this research. There will be
two interviews, but only the homemaker needs to be present. The first
interview will take one to two hours and a second interview will take
approximately half an hour. Time for keeping the record will require
another half-hour. We plan to thank our participants by offering
$10.00 for their personal use. We know that this does not measure the
value of your contribution, but we want you to know that we recognize
and appreciate the time and effort we are requesting of you.

I encourage your participation in the time-use study. Without the co-
operation of Oregon residents, Oregon State University would be unable
to conduct much of its research for the benefit of all.

Sincerely,

Geraldine Olson
Principal Investigator and Head
Department of Family Resource Management

lb

APPENDIX D

Portion of Time Chart

Chart is crooked in original.

		12 mid	2 am		3 am			
FOOD	Food Preparation							FOOD
	Dishwashing							
SHOPPING	Shopping							SHOPPING
HOUSE	Housecleaning							HOUSE
	Maintenance of Home, Yard, Car, and Pets							
CLOTHING AND HOUSEHOLD LINENS	Care							CLOTHING AND HOUSEHOLD LINENS
	Construction							
HOUSEHOLD MEMBERS	Physical Care							HOUSEHOLD MEMBERS
	Nonphysical Care							
MANAGEMENT	Management							MANAGEMENT
WORK (other than household)	School							WORK (other than household)
	Paid							
	Unpaid							
NONWORK	Organization Participation							NONWORK
	Social and Recreational Activities							
PERSONAL MAINTENANCE	Personal Care (of self)							PERSONAL MAINTENANCE
	Eating							
OTHER	Other							OTHER

APPENDIX E

Correlation Coefficient Matrix

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1	1.0	.93	.70	.67	.08	.08	.28	.01	.33	.06	.29	.11	-.62	-.35	-.26	-.33
2	.93	1.0	.70	.65	.08	.09	.26	.03	.31	.09	.28	.09	-.62	-.38	-.27	-.36
3	.70	.70	1.0	.30	.07	.08	.28	.20	.32	.05	.26	.09	-.38	-.20	-.15	-.22
4	.67	.65	.80	1.0	.04	.06	.24	.24	.29	.08	.28	-.08	-.40	-.16	-.13	-.18
5	.08	.08	.07	.04	1.0	.97	.06	-.08	.01	.01	.08	.03	-.01	.04	-.01	.001
6	.08	.09	.08	.06	.97	1.0	.04	-.02	.04	.01	.12	.01	-.01	.03	-.01	-.02
7	.28	.26	.28	.24	.06	.04	1.0	.11	-.16	.01	.14	.01	-.23	-.21	-.09	-.16
8	.01	.03	.20	.24	-.08	-.02	.11	1.0	.02	-.19	.19	-.21	-.001	-.02	-.01	-.02
9	.33	.31	.32	.29	.01	.04	-.16	.02	1.0	-.001	.11	.02	-.22	-.21	-.10	-.16
10	.06	.09	.05	.08	.01	.01	.01	-.19	-.001	1.0	.16	.35	-.006	.05	-.02	-.03
11	.29	.28	.26	.28	.08	.12	.14	.19	.11	.16	1.0	.05	-.15	-.11	-.06	-.09
12	.11	.09	.09	-.08	.03	.01	.01	-.21	.02	.35	.05	1.0	-.15	-.07	-.16	-.08
13	-.62	-.62	-.38	-.40	-.01	-.01	-.23	-.001	-.22	-.006	-.15	-.15	1.0	.37	.36	.35
14	-.35	-.38	-.20	-.16	.04	.03	-.21	-.02	-.21	.05	-.11	-.07	.37	1.0	.07	.53
15	-.26	-.27	-.15	-.13	-.01	-.01	-.09	-.01	-.10	-.02	-.06	-.16	.36	.07	1.0	.22
16	-.33	-.36	-.22	-.18	.001	-.02	-.16	-.02	-.16	-.03	-.09	-.08	.35	.53	.22	1.0

1 = Age of youngest child
2 = Age of oldest child
3 = Age of homemaker
4 = Age of spouse
5 = Education of homemaker
6 = Education of spouse
7 = Occupation of homemaker

8 = Occupation of spouse
9 = Number of hours employed by homemaker
10 = Number of hours employed by spouse
11 = Family income
12 = Family residence
13 = Homemaker's Physical Care Time
14 = Homemaker's Nonphysical Care Time

15 = Spouse's Physical Care Time
16 = Spouse's Nonphysical Care Time