

Characteristic Philosophies of Families Toward Time Resource Use: A Combined Factor and Cluster Method

Using combined factor and cluster analyses, the feasibility of categorizing families by characteristic philosophies, vis-a-vis concordance between their reported weekly time use choices and resulting satisfactions, was investigated. Results suggest some families might function using ingrained behaviors that are inefficient, i.e. not utility maximizing, in producing life satisfaction. Observed family philosophy differences existed that were not easily attributable to ready demographics such as gender, marital status, number of children, and, somewhat less, paid employment.

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Background

The New Home Economics (NHE) model promoted by Becker holds that families maximize their utility through consuming household goods and services produced from market and time resources subject to a full income constraint and economically rational behavior (Becker, 1981). Family processes are viewed as a consistent function acting on a vector of resources essentially with demand for each resource observable holding other inputs constant. Further, Becker proposed that a single decision making head of household acts as an altruist toward the other family members who in turn find it in their best economic interests to abide by his/her decisions. Thus, families always maximize their joint utility rather than their individual utilities.

Empirically, considerable research has been conducted to identify factors that determine the demand for time use allocation by families in contemporary American culture. Studies include Nickols and Metzen (1978), Coverman (1985), Sanik and Mauldin (1986), Ross (1987), Kamo (1988), Goldscheider and Waite (1991), Brayfield (1992), Demo and Acock (1992), Bryant (1992), Lennon and Rosenfeld (1994), Zick and Bryant (1994), Dannerbeck (1995), and Bryant and Zick (1996). The models in most studies reflect NHE theory regarding families' market and non-market time allocation decisions, especially female's employment decisions and division of housework (Key & Firebaugh, 1989). Varying reasons have been proposed for the observed distributions of time uses including household specialization efficiency, relative power and relationship domination, traditional versus egalitarian values, opportunity costs of labor, demographic differences, and household demands relative to response capabilities.

Most researchers have operationalized their empirical models by determining the impacts of exogenous variables separately, content to hold the remaining variables analytically constant at their average values. Variables such as family resources and demographics typically are entered into the model as main effects, though occasionally a limited set of interactions is included. The inconsistent results across these studies suggest, however, that these models are not completely specified. Estimated impacts appear to be sensitive to the families' cultural and behavioral contexts as well as to what combinations of explanatory variables are included and their form.

Characteristic Philosophies of Families

What is missing from Becker's theoretical construct and these studies is a model that captures more of the gestalt, the larger picture, of each family's dynamic. Zick (1992) restates a continuing criticism of Becker's model requirement that family members work in concert, that there is a common effort by all other family members to maximize the income and, thus, the utility of the head of the household. However, in contemporary culture, family members seldom hold things constant. Family's decisions often emanate from divergent demands. A "family outcome" may be more an artifact of the imposed sampling unit than a reality. Families can operate much like a geological aggregate composed of different sized particles, when thrown it goes in one direction but it shatters upon striking the target. As such, the expected joint utility of a family decision can be quite different from the realized utility.

An alternative model to New Home Economics called the Family Resource Management model (FRM) allows households to make decisions and manage their resources through family processes that develop tastes and preferences, assess the validity of information on resources and action options, select action plans, control quality, and learn (Key

& Firebaugh, 1989). Further, this paradigm allows the possibility that these processes may be inherently biased and result in some families operating less effectively than others despite the known institutional parameters. Family therapists have suggested for decades that families may form around a characteristic affective behavior, a philosophy of life, resulting in different outcomes across similar demographics (e.g. Constantine, 1986).

Whether by choice, genetics, or authority the behaviors of individuals in a family tend to form a complex, integrated dynamic, though not necessarily a "nice" one in the Beckerian sense. Further these signature dynamics may be like habits and, once formed, remain a dominant guiding force despite their actual effectiveness on enhancing a family's decision outcomes. So, it is possible that estimating general family impacts of separate explanatory variables may not be as meaningful as understanding the same impacts within the context of families' characteristic patterns of these resources and attributes and may miss important elements of household decision making. Time use patterns may be determined by numerous factors with a complex causal structure. Zick (1992) called for challenging traditional theoretical assumptions and building new models of family decision making.

Unfortunately, current data sets on family time use generally possess insufficient information to allow researchers to directly categorize family processes. Some researchers, attempting to type families by different family demographics such as their physical, legal, or employment family structures only met with moderate success (e.g. Sanik & Mauldin, 1986), Zick and Bryant, 1994), and Bryant & Zick, 1996). Seemingly in this spirit, Zick (1992) also stressed the need for family researchers to expand and improve on the types of data collected.

Avery, Bryant, Douthitt, & McCullough, (1996) have further recommended that the focus of future research "be on whether the way people use their time is important in determining their own and their household's welfare." The current research examines the feasibility of identifying distinct family philosophies indirectly vis-a-vis family heads of households' reported unpaid time use allocations and their concomitant satisfactions with these choices through combining factor and cluster analyses. The objectives are to identify patterns of heads of households' unpaid time uses and time use domain attitudes using factor analyses, identify groupings of families within distinct time use and attitude patterns using cluster analysis, and qualitatively assess the resulting clusters to determine the viability of associating the groups with characteristic family philosophies.

Interpretable clusters would suggest that characteristic philosophies and methods of operation may exist across families. While this will not say conclusively that some families don't always obey the maximization assumption it can suggest that characteristic household dynamics exist and that further study needs to be conducted on their differential impact on family decisions and outcomes.

Time Use Dataset

In the Spring and Fall of 1994, the Department of Consumer and Family Economics (CFE) at the University of Missouri-Columbia surveyed the time use patterns of local families with at least one 5th grade child, resident or non-resident in the home (Dannerbeck, 1995). The original goal of the Columbia Time Use Survey was to explore the level of authority and responsibility sharing arrangements within families with school-age children and their level of life satisfaction. CFE sent two questionnaires to each household. Forms were independently filled out by each resident parent and 569 responders sent back usable forms. Medical, academic, and insurance professional paid work classifications dominated respondents' work situations.

Information was collected on family structure, division of household responsibilities, personal respondent information, paid work time use, unpaid time use, and attitudes/perceptions about the family's uses of its time and satisfaction with this allocation. Paid work, unpaid time, and attitudes and perceptions responses covered pre-selected domains of potential time use by the respondents: parent or child, spouse or partner, extended family, friends, recreation or social life, job, home, community.

Most attitude and perception questions required five- or seven-point Likert-type scale responses for up to nine

Table 1
Example of Detailed Attitude Question For Time Use
Domains

Please rate your EFFECTIVENESS in each role using the following scale (leave blank for spouse/partner if none at present):

1 VERY POOR	5 A BIT ABOVE AVERAGE
2 POOR	6 VERY GOOD
3 A BIT BELOW AVERAGE	7 EXCELLENT
4 AVERAGE	

1. _____	Parent
2. _____	Spouse/Partner
3. _____	Member of Your Extended Family

time use categories (e.g., Table 1). One set of questions focused on Actual vs. Desired Time, Paid Work Effects, and Satisfaction with time use domains. Another set investigated the Importance of and Effectiveness in different family roles. Role Importance asked respondents to rate the importance to themselves of different family roles.

Combining Factor and Cluster Analyses

Of the survey's potential variables, inspection narrowed the usable set to forty-six domain-specific variables across five questions involving unpaid time and attitudes toward different domain satisfaction aspects. However, two analysis problems were clear. The questions themselves were related. Further, the responses across time use domains subsetting a question response appeared to be highly correlated. Thus factor analysis was deemed appropriate to condense this data set into a few composite factors (see MacDonald & Douthitt, 1992).

Factor analyses were run on the time use categories (variables) within the listing of unpaid time spent by category and four of the attitude questions (Concordance of Actual vs. Desired Time spent on a Domain, Paid Work Effects, General Satisfaction within a Domain, and Role Effectiveness). Final analyses used a PROMAX method and scaled factors were standardized to mean zero and standard deviation of one. Further, the dataset was divided into married and not married for factor analysis.

Similarly interpretable factors were subsequently analyzed together using an oblique rotation. This procedure resulted in being able to reduce, for married responders, the attitude domain responses from 35 highly collinear variables

to nine relatively independent and easily interpretable variables (see Table 2). Unpaid time variables were similarly reduced from eleven to three.

With two exceptions, the minimum eigenvalues acceptable for the attitude variables were set above their average rather than "1" to capture a robust set of factors for aggregating moderately heterogeneous households. Minimum eigenvalue criteria for the new Concordance and Work Effect factor groups, however, were set below the average to include two extra factors. This solution possessed a much clearer interpretation, possibly due to Work Effect capturing so much of the variability that it had masked other potentially meaningful factors.

A cluster analysis on these new scaled factors was then performed to identify logical groups of respondents. Clustering was performed on both the married and not married data by

matching factor interpretations. This worked well for all except the General Life Satisfaction factor for marrieds versus the Job Satisfaction factor for not marrieds. However, these two were eventually merged under the assumption that, due to their situation, single parents may base a General Satisfaction attitude on the economic and personal reward aspects of their jobs. That is, single parents are often forced to sacrifice leisure time for income, thus their general life satisfaction might be reduced to measuring how well s/he provides economically for the family.

Table 2
Reduced Variable Set For Unpaid Time & Attitudes/Perceptions

<u>Variable</u>	<u>Interpretation</u>
Hr Child Evnt	Hours Spent with Children's Events
Hr Prsnl/Soc	Hours Spent for Personal/Social Development
Hr Imm Fam	Hours Spent with Immediate Family (excl.Hr Child Evnt)
Sat Par-Chld	Satisfaction with Parent-Children Relations
Sat Xtd Fam	Satisfaction with Extended Family
Sat Soc	Satisfaction with Social Life
Sat Gen/Job	Satisfaction - General (married) or Job (not married)
Paid Wrk Effct	Positive Effect of Work on All Time Use Domains
Cncrd Par-Chld	Concordance of Actual v. Desired Time for Parent-Child Relations
Cncrd Pub Life	Concordance of Actual v. Desired Time for Public Life
Cncrd Persl Life	Concordance of Actual v. Desired Time for Personal Life
Cncrd Cmnty Life	Concordance of Actual v. Desired Time for Community & Social Life

Ward's minimum variance method was chosen for the clustering algorithm. This method fits the idea that logical clusters should minimize the variance of respondents across their patterns of both unpaid time use and attitudes. A dendrogram indicated both the five and the three cluster solutions. However, inspection of the vertical distances (SPRSQ) and sizes of the clusters (CL1=184, CL2=318, CL3=67) resulted in choosing to characterize only the three cluster solution.

This analysis was performed on individual respondents, so the degree to which the spouses from the same family were clustered together (cluster agreement) was examined. Of the 190 households for which both spouses responded, 46% had perfect cluster agreement (Table 3). As discussed later, however, only 18% (12% of the entire sample) showed serious disagreement by having one spouse placed in Cluster 1 or 2 while the other spouse fell into Cluster 3.

Table 3
Cluster Agreement of Same Family Respondents

Primary Respondent Cluster	Secondary Respondent Cluster			Total
	1	2	3	
1	24 12.6%	32 16.8%	5 2.6%	61 32.1%
2	37 19.5%	57 30.0%	8 4.2%	102 53.7%
3	7 3.7%	14 7.4%	6 3.2%	27 14.2%
Total	68 35.8%	103 54.2%	19 10.0%	190 100.0%

Frequency Missing = 189

Interpretation of Cluster Attitude & Time Use Profiles

Univariate statistics (means and proportions) for the different clusters are represented graphically in Figure 1. The graph titled "General Demographic Profiles" profiles the proportion of females (=1) to males, the proportion of married (=1) respondents, and the average number of children of the clusters. Also, the hours of paid work of the respondent in Figure 1 is the average of the indexed number of paid hours where 0=less than 5 hours, 1=between 4 and 31 hours, 3=between 30 and 46 hours, 4=greater than 45 hours. In the graphs that follow, connecting lines are included only for distinguishing clusters and do not represent trends.

Figure 1 shows that with one exception the demographics of each cluster are about the same. Cluster 1 has the most female (63%) respondents but not much more than Cluster 2 (59%) or Cluster 3 (52%). Further, these respondents have about the same ratio of married to non-married as the other two clusters (86%, 85%, & 79%, resp.). Their average number of children (2.4) lies between the other two groups (2.2 & 2.5, resp.). Comparisons of the average numbers of resident children in various age groups and adult dependents showed few differences across the clusters (not shown). Cluster 3 possessed the highest average numbers of young children (0.2) and adolescents (0.8) of the three groups only by small margins. Cluster 1 was the one group reporting resident adult dependents (0.04).

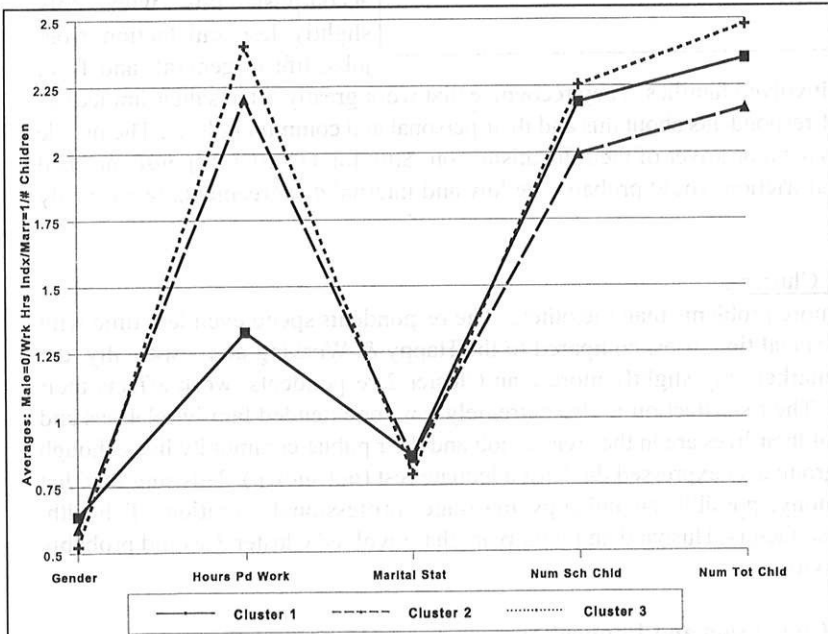


Figure 1. Time Use: General Demographic Profiles

However, the graph titled "Domain Satisfaction & Unpaid Time Profiles" (Figure 2) reveals distinct behavior and attitude patterns across clusters. The means of the scaled responses for each cluster make up the vertical axis of the plots. Further, attitude variables were recoded so that a higher value represents relatively greater satisfaction, concordance,

or a more positive effect. A higher value also means more hours spent in an unpaid time use category. The interpretations discussed below are based on each cluster's average paid work hours (Figure 1) and their attitudes or perceptions of satisfactions toward their time allocations (Figure 2).

Happy, Child Oriented & Low Work -- Cluster 1

This cluster engages in the least paid work (Figure 1) and what work they do does not have much negative effect on their life satisfaction (Figure 2). They spend considerably more time than other family types attending their children's events and in immediate family activities (see Figure 2). Personal and non-child oriented social activities are a secondary

part of these respondents' philosophy. Their overall satisfaction is comparatively high, especially their satisfaction with their child oriented social life. Thus the major time use domains of any concern for these individuals are their public and personal time use domains. However, compared to the other groups these areas are still quite satisfactory.

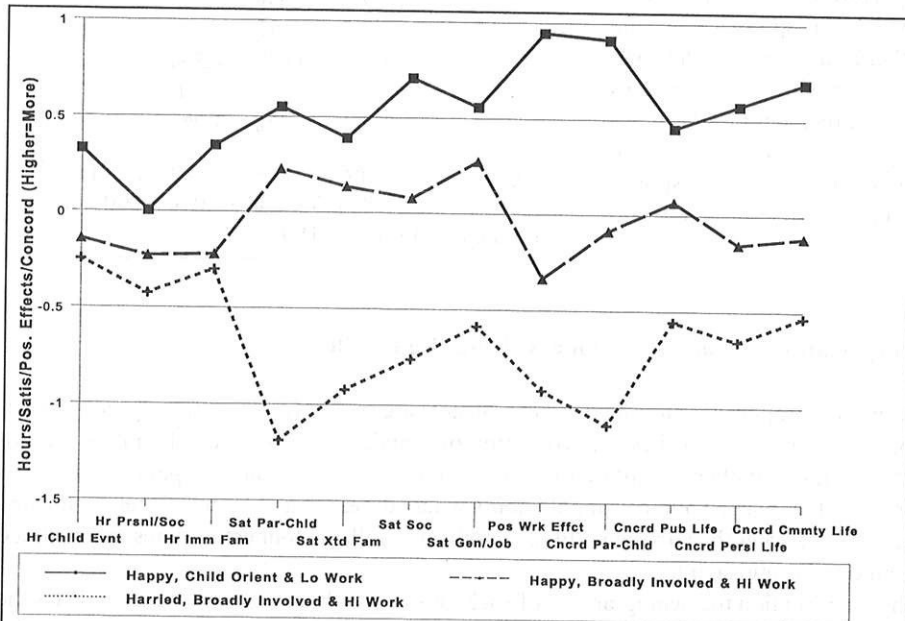


Figure 2. Time Use: Domain Satisfactions & Unpaid Time Profiles

Happy, Broadly Involved & High Work -- Cluster 2

This group, on the other hand, tends to spend much more time than Cluster 1 working for pay and less with children and family though relatively more with self. Somehow they accomplish this with only slightly less satisfaction from jobs, life in general, and from

their children's development than the Child Involved families. They recognize that work greatly affects their immediate families and, thus, worry more than Cluster 1 respondents about this and their personal and community lives. The profile suggests that the undesirability of working is a major driver of their dissatisfaction. Still, for a Cluster 2 spouse matched with one from Cluster 1, the level of internal friction would probably be low and internal disagreements fairly easily reconcilable.

Harried, Broadly Involved & High Work -- Cluster 3

These individuals appear to have more problems than the others. The respondents spend even less time with children, immediate families, and personal/social time uses, compared to the Happy & Working and, especially, the Child Oriented. Though they work in the market only slightly more than Cluster 2 respondents, work affects their parent-child relations much more adversely. Their satisfaction is also extremely low for extended family relations and their children's development. The best parts of their lives are in the areas of job and their public/community lives, though still low relative to the other clusters. This group also expressed the least adequate rest (not shown). This suggests that something is interfering with family harmony, possibly an unhappy marriage, professional ambition, ill health, adolescent troubles, or a combination of these factors. Husband and wife pairs that involved Cluster 3 would probably exhibit very disjoint, utility inefficient behaviors.

Conclusion and Implications

Except for paid work hours, demographic and structural differences between clusters were minimal. The clear interpretability of the clusters then suggests that characteristic philosophies may exist across families and be important

predictors of outcomes. Distinct levels and patterns of satisfaction with their chosen time allocations were exhibited by the clusters. Additionally, philosophical disagreements seem to exist between husband and wife pairs. While these results are only preliminary, they encourage the suspicion that standard regression models which categorize families primarily by simple demographics may be a cause of previous inconsistent empirical findings. Further, both results support the notion that the Beckerian altruism model of family utility maximization may not be generally applicable.

Perhaps rigorous frameworks should be explored that allow for some families behaving with imperfect economic rationality, in inefficient or even discordant ways. As an aid to this, researchers should more thoroughly investigate family time allocation and satisfaction within the context of characteristic family philosophies. Finally, policy makers interested in accurately predicting family time uses and well-being in different situations should consider funding the collection of additional attitude and perception information.

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Endnotes

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