On Household Bargaining:

Theoretical Models and Empirical Evidence

Second Draft

21H.927J Paper

On Household Bargaining: Theoretical Models and Empirical Evidence

1. Introduction

Household expenditure behavior can be modeled various ways: under assumptions that spouses work together to maximize household utility, or under assumptions that they work as competitors who each have bargaining power as a result of their own income and different preferences from their utility functions. I use data from the Bureau of Labor Statistics' 2001 Consumer Expenditure Survey to determine, for women, how much being married, working, or being the sole earner for a household affects their household expenditure. By considering only expenditure and characteristic data for survey respondents and their spouses, I am able to examine both single-earner and two-earner households; I am also able to examine households of unmarried and married individuals. In order to compare across both work and marital status, I divide my sample into several treatment and control groups, and then interpret coefficients from these regressions. In general, I find that households with married women significantly change their expenditure when the women work – they are more likely to spend on smoking supplies and less likely to spend on housekeeping supplies and services, and spend a larger share of their budgets on personal products. Further, single-earner females have a very large decrease in likelihood of household expenditure on housekeeping supplies and services when they are married. These finds suggest that married women gain some bargaining power when they enter the workforce and can change their household's consumption, in particular with regard to expenditure on housekeeping supplies and services. Because of the nature of this good, these results support the models of household expenditure behavior with bargaining between the

heads, instead of an altruistic dictator who makes decisions.

2. Literature Review

Several models of household utility behavior attempt to describe how increases in income affect each earner's influence over his/her household's spending. Incomes are sometimes pooled so changes in either earner's income affect household consumption identically, but for certain expenditure items, increases in consumption are associated only with an increase in one person's income. Originally, a theoretical model viewed the household headed as by an "altruistic dictator," and the husband and wife as subject to a single budget constraint. Here, regardless of which received income, it would be allocated the same way. After this came a collective model, in which males and females did not allocate identically; they had different utility functions for the household, but still cared about each other's utility. Household behavior later was compared to the results of a Nash-bargaining game, in which individuals had separate utility functions. Their incomes affected their bargaining power, which in turn affected allocation of resources. [1]

There are examples of goods which fit in "separate spheres"; an increase in consumption of one of these goods as a result of only one person's income may represent a gendered responsibility for purchasing this good, and not a share of bargaining power. Mary C. Noonan describes the division of spheres by defining tasks performed on a daily basis, during a certain time, as female. Conversely, she labels tasks that occur irregularly and that can be performed at unfixed times as male tasks. [2] This is supported by Phipps's results that increases in female

---

[1] Phipps, Shelley A., and Burton Peter S., 1998, "What's Mine is yours? The influence of male and female incomes on patterns of household expenditure," *Economica*, 65, 599-600.
[2] Noonan, M. C. (2001). "The impact of domestic work on men's and women's wages." *Journal of Marriage and Family, 63,* 1134-1145. (#35)

income are associated with increases in spending on child care, while increases in male income are associated with more spending on car maintenance. In addition, the notion of gendered tasks also can be categorized so that females perform "unpleasant" household tasks like cleaning and laundry, while males perform "pleasant" tasks like shopping and meal preparation.[3] A study in the Netherlands confirms both of these theories; it found that an increase in female income correlates with an increase in cleaning services expenditure, a regular and unpleasant task, and an increase in male income correlates with an increase in restaurant and take-out food consumption, an occasional and not unpleasant task. [4]

3. Data

The data for this project are from the Bureau of Labor Statistics' Consumer Expenditure Surveys, and were collected in the first quarter of 2001.[5] I am using the Diary Survey, which was recorded over a two week period and has information on "small, frequently-purchased items" like food, beverages, nonprescription drugs, and medical supplies. The reason I am using the Diary Survey data instead of the Interview Survey data, which is collected every quarter for 15 months, is because I expect that changes in small household purchases will show a more immediate and clear correlation with changes in female labor force characteristics than large and infrequent purchases like "rent, utilities, or insurance premiums."

The Diary Survey data themselves are at a level of detail with information on how much

---

[3] Stier, H., & Lewis-Epstein, N. (2000). "Women's part-time employment and gender inequality in the family." Journal of Family Issues, 21 (3), 390-410.

[4] Lippe, T. van der, Tijdens, K., Ruijter, E. de (2004). "Outsourcing of Domestic Tasks and Timesaving Effects." *Journal of Family Issues* 25(2): 216-240.

[5] U.S. Dept. of Labor, Bureau of Labor Statistics. CONSUMER EXPENDITURE SURVEY, 2001: DIARY SURVEY [Computer file]. Washington, DC: U.S. Dept. of Labor, Bureau of Labor Statistics [producer], 2002. Ann Arbor, MI: Inter-university Consortium for Political and Social Research [distributor], 2003.

a household spends on specific food items, like pork, fresh vegetables, and eggs. For this study, I choose to look at spending on four non-food goods: smoking supplies, housekeeping supplies and services, personal products, and personal services. Smoking supplies include spending on cigars, cigarettes, and smoking accessories; housekeeping supplies and services include spending on soap, laundry detergent, stationary, gift wrap, and delivery services; personal products include spending on hair care products, cosmetics, oral hygiene products, and deodorant; personal services include spending on haircuts and personal care appliance rental or repair. Note that it is unclear from the Bureau of Labor Statistics' codebook if housekeeping supplies and services includes maid service, but since the only service they describe is for deliveries, and presumably outside cleaning service would have been stated if it were included, I take their data to mean that household supplies and services expenditure does not contain spending on maid service.

The data on expenditure are collected at the level of a "Consumer Unit," which is defined as all of the people in a household related by blood, marriage, adoption, or another legal method. For this Consumer Unit, there are data on family size, household income, and number of earners. For each individual in the consumer unit, there are demographic data on his/her race, marital status, education level, as well as characteristic data on the number of weeks he/she worked. Each household has a reference person, for whom there are the data described above. Households also may have additional data for individuals like the reference person's spouse, child, grandchild, in-law, brother, sister, parent, or other household member.

The Bureau of Labor Statistics, in their published dataset, excludes ineligible (vacant, nonexistent, or otherwise ineligible) and non-responding (unable to be contacted or refused to participate) diaries. In the published dataset, there are 15,404 respondent interviews. I first restrict the data to families who do not purchase food stamps, and then delete records for

individuals who have a negative wage. Furthermore, I exclude individuals who are not a reference person or his or her spouse, to focus on one particular type of earner and establish a well-defined relationship with a second potential-earner in the household, if he/she in fact has a spouse. Examples of excluded individuals include the reference person's child, grandchild, in-law, brother, sister, or parent. Not all reference persons have a spouse, so some Consumer Units will have two records of identical expenditure (one for the reference person, one for his/her spouse) and others will have one record of expenditure (for the unmarried reference person). With these additional deletions, the data have expenditure information for 5226 persons: split by marital status, 3400 reference persons and 1826 spouses, and split up by gender as 2455 males and 2771 females.

To control for education, I create dummy variables for general levels of educational attainment. In the "low education" group, I put individuals who have never attended school, or attended up through 12th grade without a diploma. In the "medium education" group, I put individuals who have some college education or an associate's degree (occupational/vocational or academic). In the "high education" group, I put individuals who have a bachelor's, master's, or doctorate degree. Additionally, I control for race by making dummy variables for white, black, American Indian, Aleut, or Eskimo, and Asia or Pacific Islander individuals. The final demographic control I use is for marital status; though there are 1826 spouses, some of the 3400 reference persons are not married. Consequently, I make dummy variables for marital status of married, divorced, widowed, separated, or never married.

One potential shortcoming of the data is due to timing. Because the survey data are collected during a two-week period, there may be undocumented seasonal explanations for the level of spending on a certain item. For example, certain types (married, working) of women

may spend more on sweets close to a holiday or special occasion than during other times of the year, but no question in the survey addresses this potential reason for spending. However, I have chosen items (smoking supplies, housekeeping supplies and services, personal products, and personal services) that I believe do not face this possible seasonal variation. A more general potential shortcoming of the data is selection bias; the Bureau of Labor Statistics omits the data from households who were unable to be contacted or refused to participate, and this may cause the remaining data to be non-random in its sampling of the nation's households.

4. Methods and Results

To determine how household spending for women differs across marital and work status, I perform regressions of individual and household characteristics on consumer expenditure. In all of these regressions, I control for race and education, as well as family size and log of family income.

For spending on the four non-food items I am studying (smoking supplies, housekeeping supplies and services, personal products, and personal products), I split goods into two categories: binary spending and log level spending. I choose to make spending on smoking supplies or housekeeping supplies and services a binary value because I want to consider whether not households spent any money at all on these goods and do not want to analyze how much they spent. After making the restrictions I describe above, 4207 individuals spend zero on smoking supplies, and 1019 spend an amount greater than zero. Analogously, 2238 individuals spend zero, and 2988 individuals spend an amount greater than zero on housekeeping supplies and services.

Regarding spending on personal products and personal services, I choose to regress on

the log of level of spending, since I predict that the relationship between a woman's

characteristics (the variables of interest work status and marital status, as well as controls of

family size and log of family income) and household expenditure will correlate more strongly

with how much the household spends on these goods, not whether it spends any money or not.

I use probit regressions on the binary dependent variables for smoking spending and

housekeeping spending. The coefficient on each regressor will report a change in likelihood in

the dependent variable (here, spending or not spending) for a marginal change in a continuous

independent variable. In my particular statistical analysis, I perform a further calculation, so for

independent variables that are dummy variables, the values I present will represent a change in

probability of likelihood of the dependent for a change in probability for the binary independent.

For the log level goods, I use ordinary least squares regressions. The coefficients on the

independent binary variables for marital or work status (SPOUSE and WORK in Table 1,

respectively) will represent the increase in log level of expenditure for an individual with a

spouse as compared to not having a spouse, controlling for demographics. Alternatively, let a

person's household expenditure be Y; a single person's log of expenditure will be log(Y) and the

coefficient β represents the increase for a married person, whose log of expenditure will be

log(Y) + β. In order to facilitate the interpretation of my results, I have taken the values of the

increase in log of expenditure dollars and calculated the values for the increase in expenditure in

terms of dollars.

Unmarried	Married	(units	)
Log (Y)	Log(Y) + β	Log	dollars
$e^{\log(Y)} = Y$	$e^{\log(Y) + \beta} = Y * e^{\beta}$		Dollars

Consequently, e^{β} represents the proportion of a single person's expenditure that the

same person who is married would spend. For example, if the coefficient β is negative, then the value of e^{β} will be less than one, which represents a decrease in expenditure for the same person when married. Similarly, a positive coefficient β will correspond to a value of e^{β} greater than one: an increase in expenditure for the married person.

Table 1 displays results for the four goods from each of the five regressions. Looking only at females who work (regression A), I find that an increase in likelihood of having a spouse correlates with being in a household that is about 93% less likely to spend on housekeeping supplies and services. Within this same subgroup of working women, I find that changes in likelihood having a spouse does not significant correlate with an increase or decrease in the proportion of log level of household expenditure on personal products or personal services, and does not significant correlate with being a household that significantly is more or less likely to spend on smoking supplies.

Now, consider the subgroup of women who do not work (regression B in Table 1). I was initially concerned that this group would be almost entirely composed of women who were married, but of the 930 women in this subgroup, 581 have a spouse, and 349 do not. For a woman in this group, her household is 39.7% less likely to spend on smoking supplies when she has a spouse. This can be interpreted as an increase in likelihood of household expenditure on smoking supplies for a single woman, which may be because someone who is single does not bother anyone if she smokes, but her spouse may not tolerate smoking. In this case, having the spouse affects whether she is allowed to allocate spending on smoking supplies. It is also possible that many women who don't work and have spouses are full-time mothers, and thus are in households that are less likely to spend on smoking supplies because they want their children to be healthy. Though I controlled for family size in this regression, I did not control for having

kids or not, which would provide additional insight. Furthermore, the household of a married female who does not work spends 24% on personal services of what the household would have spent if she were single. In this case, having a spouse allows the two heads of the household to combine spending for common expenditure, like appliance repair. It is unlikely that a husband and wife in the same household would need to repair two vacuums or refrigerators, and so being married decreases the household expenditure in the personal services category. One model of household utility maximization that fits this result is the altruistic dictator model; in this subgroup B, women don't work, and those women who are married are probably married to an earner. The extent of the allocation of income to joint expenditure depends on the nature of the good, and for personal services appears to be substantial, reducing the woman's spending by 75%.

Among married women (regression C in Table 1), the results between working and not working are most significant among the binary spending on smoking supplies and housekeeping supplies and services. A married woman's household is 10.9% more likely to spend on smoking supplies and services when she works. Perhaps she is stressed from working, so she smokes to relieve tension. Another interpretation is that her husband wants to smoke, and if she didn't work she would be able to stop him from purchasing cigarettes, but since she is at work he has assumed the freedom to buy them. Because I control for household income, it cannot be an income effect (that the *increase* alone in household income from her working) allows either the husband or wife to buy smoking supplies. Here, then, is a potential shift in household bargaining power or shift in supervision of purchasing.

In this same group of married women (regression C), a household is 8.5% less likely to spend on household supplies and services when the woman works, controlling for demographics.

As I state in 3. Data, I suspect that the majority of this expenditure is on supplies, and a married woman who works has less time to spend on cleaning, so her household is less likely to spend in this category when she works. Yet another interpretation is that households with married women that work have less time to *buy* these supplies, so expenditure is made during fewer trips and supplies last for a longer period of time. To check this, I would need data from multiple surveys, which would collect data for a longer window than the two-week window of this study. The results for expenditure of households comparing married women who do work to those who don't work are not significant for personal products or personal services. Moreover, there are no significant results across all four goods when comparing expenditure in households between unmarried females who do or do not work (regression D).

Finally, consider women who are their households' single worker (regression E in Table 1); the variable of interest in this subgroup is marital status, since the single-worker females can be either married or unmarried. Of the 1304 women who are the sole employee in their households, 359 are married and 945 are unmarried. Single-worker women who are married are 88.8% less likely to be in households that spend on housekeeping supplies than unmarried single-earner females' households. Here, it is very likely that the single-worker females who are married might have less time to perform this duty or go shopping for these supplies because they likely have children to take care of. They also may have time constraints from being married if their spouse is disabled. Also, for a given single-worker female, the married ones may have husbands who do not perform this gendered-female task, so expenditure has decreased because of a decrease in the amount of cleaning performed in the household. Also, she may be more likely, with her extra income and busy schedule, to hire a maid or cleaning company, who may purchase the housekeeping supplies for her.

5. Conclusion

Overall, my results suggest that married women who enter the workforce have increased bargaining power in their household. Not only is their additional income allocated differently, but in particular how it is allocated under housekeeping supplies and services brings to light that a woman's time and income constraints allow her to decrease the likelihood purchasing of household supplies, most likely so she can do all the purchasing at once or outsource cleaning duties to an external company. According to the theories of gendered spheres in section 2. Literature Review, cleaning is classified as an "unpleasant" good, so by entering the workforce, the married woman is able to decrease the amount or frequency she has to perform this unpleasant female task.

For binary household expenditure on housekeeping supplies and services, my results reveal that the adult earning the money does affect whether the household spends. The fact that a single-earner female's being married (regression E) decreases the likelihood of spending corresponds to a model of household decision-making behavior in which there is some bargaining between spouses. Also, having a job (regression C) does affect whether married women spend (for smoking supplies and housekeeping supplies and services) and how much they spend (personal products). These results suggest that additional income may alter how the household spends, and that the wife's personal income may give her some bargaining power when making expenditure decisions with her husband.

One control I might include in future research is a binary variable for having children under 18 years old. I control for family size to try and capture part of this effect, but having the number of children would convey what part of the family size measure is for elderly living at

home, grown children, and other adult family members. This way, I would have a more accurate measure when comparing goods that a household might spend more or less on if they have young children.

Policy implications of this can extend across other goods, including childcare. As more women with children enter the workforce, it is important to determine who will take care of their children, and how much this service will cost. Determining how women are able to bargain with their additional income will give some indication of how a household will budget for childcare costs. Another good potentially affected by these results is restaurant and take-out food. Households of women who enter the workforce may consume different amounts of these goods, either due to the women's time constraints or due to her additional income, but both are affected by her bargaining power. A husband with dictatorial power over household behavior may insist that his working wife cook dinner every night for their children, but a husband who considers his wife's utility function in his decisions for the household may be likely to support consumption of restaurant and take-out food. If there indeed is an increase in consumption of these goods as mothers work, then there is reason for regulation or supervision of the nutritional quality of food prepared outside of the home.

21H.927J / WGS.610J The Economic History of Work and Family
Spring 2005