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The Relative Importance of Household Budget Categories: A Best-Worst Analysis

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Abstract

Headlines regularly report on the changing or unmet needs of households and are often focused on costs of healthcare swamping household resources or childcare costs, forcing families to make tradeoffs that negatively influence children or society. Development of impactful educational programming and public policy necessitates an understanding of various households' allocations of resources, specially the poor, food insecure households. In order to explore households' relative prioritization of expenditures, a survey was conducted in this manuscript with a sample of Midwest residents (n = 1263), with the objective of evaluating the relationship between household demographics and budgeting prioritization of six expenditure categories. Individual respondent's relative prioritization for budgeting categories was estimated using a best-worst experiment for six expenditure categories. Housing was the most important expenditure category identified for the sample. Housing also received the largest share of relative importance for two of four latent classes identified. For both low and the very low food secure households a significant and positive relationship was found between their food security status and the relative importance placed on childcare and transportation. Identification of segments of respondents with specific priorities (e.g., childcare expenditures) may aid in the development of impactful policies, particularly for at-risk populations (e.g., food insecure households).

Keywords

Household Budgeting, Consumer Preferences, Household Resource Allocation

1. Introduction

Reports about home prices, household incomes, and consumer budgets are the

focus of regular news headlines across the US. In June of 2016, Reuters reported rising inflation, gas prices, and healthcare costs (Mutikani, 2016). Forbes reported that 63% of Americans cannot cover emergencies or unplanned expenses (of even $500) with their savings (McGarth, 2016). Forbes explained that, in order to cover unplanned financial events, households resort to cutting back from other areas, borrowing the money from family, or using a credit card (McGarth, 2016).

In much of the current literature the expenditures of households and consumers are broken down into major expenditure categories. United States Bureau of Labor Statistics lists primary household spending categories as food, childcare, transportation, housing, health care, other necessities, and taxes (USBLS, 2016). According to the 2015 Consumer Expenditures Survey of average total expenditures, the largest share of expenditures was for housing (33% of expenditures) (USBLS, 2016 [2]). Transportation and food were the next biggest proportions, with 17% and 13% of expenditures (USBLS, 2016 [2]). Ferdous et al. (2010) analyzed the 2002 U.S. Consumer Expenditures Survey in order to assess the impact of rising gas prices on other consumption areas and found that transportation expenditures and food expenditures increase as income increases, but food expenditures decrease as gas prices increase (which suggests a tradeoff between transportation and food expenditures). This type of survey focuses on the size of an expenditure category in relation to other categories or the entire budget. Although someone may have a higher expenditure in a particular area that does not necessarily translate to the most important category to them, or the category that causes the most concern in their daily purchasing decisions.

Other studies have considered the impact of an event on household expenditures, such as health events and children. Using budget surveys, Brown et al. (2014) found that households with preschool aged children, elderly members, or both are more likely to experience catastrophic health expenditures, but the likelihood of an event decreases as household size increases. This same study also found that poor households and households without health insurance are less likely to access health care at all (Brown et al., 2014). Certainly past studies reinforce the common understanding that household demographics and statuses impact health care expenditures.

Brandrup & Mance (2011) consider childcare expenditures, specifically the impact of newborns on family expenditure. While some categories did not appear to be impacted by the addition of one or two new children within three years (groceries, away from home food consumption, insurance, phone and internet utilities), health care expenditures showed elevation with each added child (Brandrup & Mance, 2011). Childcare expenses were found to increase with the addition of one child, naturally, but reduced as a second child arrived. This occurred as some costs could be shared across children (Brandrup & Mance, 2011). Transportation expenditures were elevated with additional children especially with the arrival of a third child (Brandrup & Mance, 2011). Thus, the presence of

children in the household, as well as the number of total children, is expected to affect household budgeting and prioritization of spending.

Prioritization of household resources, in particular the allocation of income towards major spending categories, such as shelter (housing), food, health care, childcare, transportation, and other necessities is a necessary part of household budgeting. Much of the current literature focuses on real (past) expenditures. Some predicting and prospecting tools exist to aid households in planning expenses (EPI, 2015; Siegel, 2013) although research is limited in evaluating what expense categories are preferred, factors that impact those preferences, and potential tradeoffs between categories. Insight can be gained by looking at how households prioritize these expenditures when budgeting. Given that the vast majority of households face constraints and have limited resources for allocation, tradeoffs between expenditure categories are necessary. The main objective of this analysis is to improve the understanding of tradeoffs within and across households, by evaluating budget preferences and tradeoffs between expenditure categories with a special look at allocations made in resource scarce food insecure households.

A foundation of economic consumer theory is based on preference, or the ability of a consumer to choose one good over another (Varian, 2003). Best-worst choice tasks have been used to elicit preferences and relative ranking of priorities in many settings in recent literature. Wolf & Tonsor (2013) asked respondents, specifically farmers, to rank the importance of seven farm policies; they state "the share of preference conveys the probability that a policy is picked as more important than another." Thus, the calculated share of preference for a policy reflects both the true importance of the policy as well as the relative uncertainty in the importance that farmers place on the policy. Lusk & Briggeman (2009) used best-worst scaling to ascertain the relative importance placed on eleven food values by consumers. They found that "Safety" achieved the highest mean preference share, making it the most important food value to consumers. Lusk & Briggeman (2009) also explain that, "by having people choose the best and worst options, people are forced to decide which issues are more or less important, and unlike rating scales, there is only one way for people to respond to the question (with a choice)." Other studies have used best-worst scaling represented with different terms. Like this study, Widmar et al. (2016) used "most important" and "least important" to study holiday turkey attributes. Morgan et al. (2016) used "most socially responsible" and "least socially responsible" to estimate preference shares assigned by university students for corporate social responsibility across eleven fast food restaurants. The six expenditure categories studied in this analysis, using the best-worst scaling framework, are childcare, transportation, housing, health care, food, and other necessities. It is hypothesized that housing and childcare priorities would have negative relationships with other budgeting categories; however, the extent of such tradeoffs may vary across demographics and household factors.

2. Methodology

2.1. Survey and Data Collection

The survey of Midwest U.S. residents, the results of which are used in this analysis, was conducted February 12th, 2016 and concluded on February 26th, 2016. One thousand two hundred and sixty three respondents completed the survey and associated choice experiment. The Midwest region, as defined by U. S. Census Bureau, includes the following states: Illinois, Indiana, Iowa, Kansas, Michigan, Minnesota, Missouri, Nebraska, North Dakota, Ohio, South Dakota, and Wisconsin. For the purposes of this analysis, Kentucky and Tennessee were added to this list (USCB, 2015). The survey was designed and constructed using Qualtrics and was hosted at Purdue University. Lightspeed GMI, who manages a large opt-in panel, facilitated recruitment of potential respondents. Sex, age, annual pre-tax household income, and state of residence were targeted (through the use of quotas for respondents) to be representative of the Midwest, based on the U.S. Census Bureau, 2014 American Community Survey 1-Year Estimates (USCB, 2014).

The survey consisted of three parts: general household demographics and respondent characteristics, a choice experiment designed for best-worst analysis, and a series of questions to evaluate respondent food security. All respondents were asked general demographic questions as well as questions about their spending habits related to six expenditure categories: housing, food, childcare, health care, transportation, and other necessities. Along with general demographics, other demographic questions assessed whether or not children were present in the home and each respondent's employment status. For each of the budget categories respondents were asked to estimate and report their monthly spending in dollars per month. In regards to housing, respondents were asked about housing ownership and type. Respondents were asked about transportation utilization and car ownership relating to transportation. If respondents indicated having children, they were asked childcare associated questions assessing their use of care facilities and whether or not they receive assistance for childcare. Health care was addressed by asking respondents about their insurance coverage and treatment service utilization.

To further evaluate the food budget category, respondents were asked the ten food security assessment questions developed by the United States Department of Agriculture (Coleman-Jensen et al., 2015). Using survey results and the evaluation methodology prescribed by the USDA (USDA ERS, 2012), respondents were assigned a food insecurity score that corresponded with one of four categories: high food security, marginal food security, low food security, and very low food security.

2.2. Best-Worst Choice Experiment Design and Analysis

Respondents were presented with a best-worst scaling choice experiment designed to estimate the relative budgeting importance of six monthly budget cat-

egories including: housing, food, childcare, healthcare, transportation, and other necessities. Ten choice tasks were designed, each included three of the 6 budget categories in different combinations. For each choice task, respondents were asked to select between the three expenditure categories shown, indicating which one they considered "most important" and which one they considered "least important," when planning for their monthly household budget. An example of the question layout is displayed in **Figure 1**.

In order to assess preference, a consumer's behavior must be observed, i.e. a consumer must choose between options (Varian, 2003). Following Train (2002), a respondent in the choice experiment faces J alternatives. The utility obtained from a specific alternative, j, is represented by known parameters V_{nj} and the unknown E_{nj} allowing utility, U_{nj}, for all alternatives to be represented by

$$U_{nj} = V_{nj} + E_{nj}. \tag{1}$$

Logit models have been used to estimate the probability that a consumer will make a choice between discrete choices (Train, 2002). In other words, the probability of a respondent choosing alternative j from J alternatives can be estimated using a logit model. Each logit is estimated with a base parameter to avoid multicollinearity problems or the dummy variable trap (Train, 2002; Lusk & Briggeman, 2009). It is assumed that each unknown error is identically and independently distributed (Trian, 2002). In the multinomial logit (MNL) form best-worst pairs (or for this study most important- least important pairs) can be predicted using a set of ratio scales and can be represented in a log form and presented as (Louviere et al., 2015):

$$P_{BW}\left(ii' \mid X\right) = \frac{e^{\left[u(i)-u(i')\right]}}{\sum_{\substack{j,j' \in M \\ j \neq j}} e^{\left[u(j)-u(j')\right]}}. \tag{2}$$

The MNL estimated u represents the relative scale rank of the selected alternative i as the best choice and i' as the worst. The probabilities for the selection of each choice necessarily sum to one.

Due to the expectation that individual respondents may have heterogeneous preferences for the various budget categories, a random parameters logit (RPL) model was run and individual-specific coefficients were estimated. While the RPL allows for continuous heterogeneity in preferences among respondents, the latent class model (LCM) facilitates estimation of segments, or classes of

Most important (select one)		Least important (select one)
○	Housing	○
○	Food	○
○	Childcare	○

Figure 1. Sample question used in best-worst choice experiment design. Select the category that is the most important and the least important when you budget your household monthly.

respondents, which are heterogeneous across classes but homogenous in preferences within each class (Train, 2002). A latent class model was included in this analysis to further analyze respondent's budgeting preferences by determining discrete groups of respondents. All models were estimated in Nlogit 5 (Econometric Software, Inc. 2012). The coefficients for all models are not directly interpretable. In order to facilitate ease of interpretation, the share of preference for each choice was calculated for all models, and can be calculated following Wolf & Tonsor (2013) as,

$$B_X(x) = \frac{e^{\hat{u}(j)}}{\sum_{j'=1}^{J} e^{u(j')}}. \quad (3)$$

3. Results

3.1. Sample Summary

A summary of sample demographics for the 1,263 Midwestern residents that completed the survey can be found in **Table 1**. In total, 48% of the sample was male and the largest age category was for those 45 to 64 years old, representing 38% of the sample. Twenty-one percent of respondents were from households reportedly earning less than $25,000, while 11% earned $25,000 to $34,999, 14% earned $35,000 to $49,999, 20% earned $50,000 to $74,999, 12% earned $75,000 to $99,999, 13% earned $100,000 to $149,999, and 09% earned $150,000 or more. For brevity the income categories were condensed into three categories for further analysis: low income ($34,999 or less), middle income ($35,000 to $74,999), and high income ($75,000 or more). Twenty-eight percent of respondents had at least one child (person under 18 years old) in the household. A majority of the sample (57%) had earned a college degree. Fifty-seven percent of respondents indicated having employment, 19% were unemployed, 03% were on disability, 18% were retired, and 03% did not specify.

The results of the reported monthly expenditures for each category can be found in **Figure 2**. For housing, 16% of respondents spent $0 or no dollars on housing, 22% spent $399 or less, 31% spent between $400 and $799, 17% and 15% spent $800 to $1199 and more than $1200, respectively. All respondents reported spending some dollar amount on food each month with 59% indicating spending $399 or less per month. The vast majority of respondents (80%) indicated spending $399 or less per month on transportation, and 65% of respondents reported spending $399 or less per month on health care. A majority of respondents indicated spending zero or no money on childcare, which is unsurprising since the majority of respondents indicated having zero children living in the household.

3.2. Budget Category Prioritization

The estimates for the MNL, RPL, and LCM are presented in **Table 2**. LCM of various class sizes were estimated, and a four-class LCM was found to be the most appropriate for this data using BIC criterion. Two covariates were included

Table 1. Summary of demographics (n = 1263).

Respondent Demographics	Survey (% of respondents)	U.S. Census Bureau, 2014 American Community Survey 1-Year Estimates (%)
Male	48	49
Age		
18 - 24	08	13
25 - 44	33	31
45 - 64	38	36
Over 65	21	20
Income		
$25,000 or less	21	24
$25,000 to $34,999	11	11
$35,000 to $49,999	14	14
$50,000 to $74,999	20	19
$75,000 to $99,999	12	12
$100,000 to $149,999	13	12
$150,000 or more	09	08
At least one child in household	28	
College Degree Attained	57	
Employed	57	
Unemployed	19	
Disabled	03	
Retired	18	
Other	03	

The percent for female can be obtained by subtracting the percent for male from 100. The age categories and income categories sum to 100. Subtracting the percent of respondents with at least one child from 100 is the proportion of respondents who do not have children at home and the proportion who did not report or gave ambiguous responses for household composition. Source: U.S. Census Bureau; American Community Survey, 2014 American Community Survey 1-Year Estimates, Table S1901; generated by S. R. Dominick; using American Fact Finder; <https://factfinder.census.gov/faces/nav/jsf/pages/index.xhtml>; (21 September 2015).

and found to be significant predictors of class membership, namely having at least one child in the household and owning a home. Having at least one child in the household increased the probability of class membership for classes one, two, and three when compared to class 4 membership, while owning a home decreased the probability of class membership for those same three classes when compared to class 4 membership. Class 1 represents "House First" respondents and contained 48% of the sample. In this class, housing was the largest preference share for these respondents (79.5%), or as the most important budget category for monthly household budget planning. Food had the second largest preference share with 11.9%, followed by health care (4.0%) and transportation (3.2%). The least important budget categories in this class were other necessities and childcare with 1.3% and 0.1% preference shares, respectively. Sixteen per

Table 2. MNL, RPL, LCM model results.

					LCM							
	MNL	RPL Econometric Estimations		Shares of Preference	Coefficient				Share of Preference			
	Coefficient	Coefficient	Standard Deviation		Class 1	Class 2	Class 3	Class 4	Class 1 House First	Class 2 Balance All	Class 3 House & Food	Class 4 Food Health
Health Care	1.6147*** (0.0585)	1.9103*** (0.0597)	0.8620*** (0.0242)	13.6%	1.1358*** (0.0559)	0.6362*** (0.0600)	1.5207*** (0.1347)	1.3216*** (0.0690)	4.0%	19.5%	8.7%	**29.6%**
Childcare	−2.0787*** (0.1066)	3.5593*** (0.1256)	0.6994*** (0.0268)	4.3%	−2.7736*** (0.1374)	0.7485*** (0.0658)	0.8172*** (0.1264)	−3.2109*** (0.2207)	0.1%	21.9%	4.3%	0.3%
Transportation	0.7287*** (0.0413)	1.1693*** (0.0755)	0.7077*** (0.0234)−	4.5%	0.9106*** (0.0512)	0.1775*** (0.0565)	0.7039*** (0.1264)	0.2253*** (0.0557)	3.2%	12.4%	3.8%	9.9%
Food	2.5256*** (0.0593)	1.7199*** (0.0648)	1.3984*** (0.0261)	23.0%	2.2233*** (0.0614)	0.6889*** (0.0615)	2.7474*** (0.1595)	1.6425*** (0.0700)	11.9%	20.6%	**29.6%**	**40.8%**
Housing	2.9811*** (0.0841)	3.1294*** (0.0939)	1.5171*** (0.0269)	51.3%	4.1246*** (0.1231)	0.3917*** (0.0619)	3.3035*** (0.1804)	0.3837*** (0.0722)	**79.5%**	15.3%	**51.7%**	11.6%
Other	0	0		3.1%	0.00	0.00	0.00	0.00	1.3%	10.3%	1.9%	7.9%
Constant					1.5897*** (.2102)	−1.0640*** (.3173)	−.18916 (.2796)	0				
Children					1.5932*** (.3309)	.8158*** (.3562)	.31158*** (.3698)	0				
Owns Home					−1.3349*** (.2270)	−.6425** (.3271)	−1.6563*** (.3061)	0				
Class Probability					48%	16%	12%	24%				

Significance is represented by *p < .1, **p < .05, ***p < .01. The bold in the class results represent the categories with the highest preference share proportions.

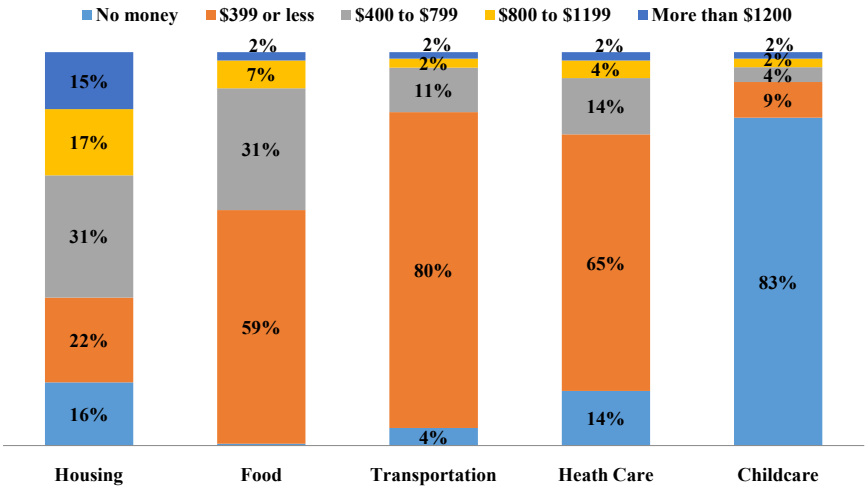

Figure 2. Monthly expenditures per category, % of respondents. The percent of respondents was calculated using the number of respondents who provided information for each category: Housing (1255), Food (1261), Transportation (1260), Heath Care (1259), and Childcare (1255).

cent of respondents fell into Class 2 or the "Balance All" class, by having nearly tantamount preference shares to most budget categories. The most important budget category was childcare and it received 21.9% of preference shares; how-

ever, food was nearly equivalent with 20.6%. The remaining budget categories had preference shares of 19.5% for health care, 15.3% for housing, 12.4% for transportation, and 10.3% for other necessities.

Class 3 represents 12% of respondents and was the "House & Food" class. These respondents, like Class 1, assigned the largest preference share to housing but at a lesser margin. For the "House Food" class, housing was given 51.7% of preference shares, food was 29.6%, health care was 8.7%, childcare was 4.3%, transportation was 3.8%, and other necessities were 1.9%. The final class, Class 4 or the "Food & Health" class represented 24% of respondents. This class deemed food as the most important monthly budget category and assigned it 40.8% of the preference share. The second most important budget category was health care with 29.6% preference share. The remaining categories were housing with 11.6% of preference share, transportation with 9.9%, other with 7.9%, and childcare with essentially zero. Recall that having a child in the household increased the probability of membership in any class aside from Class 4, thus this lack of prioritization placed on childcare in Class 4 is reflective of the likelihood that respondents with children were likely members of other classes.

The RPL model allows for the estimation of individual-specific preference shares, incorporating heterogeneity across respondents, rather than across segments (classes). Using the RPL estimate the largest mean preference share, or the most important budgeting category, was housing (51%). The category with the second largest preference share was food with 23%, then health care with 13%. The least preferred categories were transportation (4.5%), childcare (4.3%), and other necessities (3.1%).

Using individual-specific coefficients from the RPL estimation to calculate individual-specific preference shares enabled the use of correlations to determine relationships between them. Correlation estimates are summarized in Table 3. Inherent to the best-worst design, tradeoffs must occur when allocating preferences. The correlations presented help shed additional light on the directionality of tradeoffs amongst the budget categories.

Health care was positively correlated with transportation, food, and other necessities, but was negatively correlated with housing. As hypothesized, housing was negatively and significantly correlated with all other budget categories. It was hypothesized that allocations for childcare would come at the expense of other budget categories. The size of the preference share for childcare was negatively correlated with the size of the preference share for food and housing, but positively correlated with the shares for transportation and other necessities. The size of the preference share, or relative prioritization, for transportation was positively correlated with all other categories, except housing. The size of the preference share for food was positively correlated with all other categories, except housing and childcare.

In addition to correlations amongst budget categories, budget category preference shares were tested for correlations between demographics and household characteristics to gain more insight into drivers of preference (Table 4). Being

Table 3. RPL Correlations of individual-specific preference shares.

	Health Care	Childcare	Transportation	Food	Housing
Childcare	0.0160	–			
Transportation	0.0679**	0.0687**	–		
Food	0.1589***	−0.1068***	0.1513***	–	
Housing	−0.6259***	−0.3528***	−0.4235***	−0.6872***	–
Other	0.1293***	0.0785***	0.5762***	0.2756***	−0.5124***

Significance is represented by *p < .1, **p < .05, ***p < .01.

Table 4. RPL Preference Shares Correlated with Demographics.

	Health Care	Childcare	Transportation	Food	Housing	Other
Male	0.0496*	0.1317***	0.0487*	0.0068	−0.0978***	0.065**
Age 18 to 24	−0.072**	0.0394	0.0338	−0.0086	0.0165	0.0181
Age 25 to 44	−0.1168***	0.3075***	0.1103***	−0.0728***	−0.0466*	0.0549*
Age 45 to 64	−0.0379	−0.2036***	−0.0579**	−0.0287	0.1309***	−0.0449
Age 65 or older	0.2255***	−0.1363***	−0.0797***	0.1231***	−0.1127***	−0.0213
Low Income	−0.0798***	−0.1069***	0.0027	0.023	0.0748***	−0.0554**
Middle Income	−0.0123	−0.0145	0.0026	−0.0118	0.0156	0.0158
High Income	0.0908***	0.1196***	−0.0053	−0.0109	−0.0892***	0.0388
No Children in Household	0.0448	−0.2814***	−0.077***	0.0297	0.0882***	−0.0372
At least one Child in Household	−0.0885***	0.345***	0.062**	−0.0412	−0.0831***	0.0484*
College Degree Attained	0.0443	0.1313***	0.0009	−0.0121	−0.0703**	0.0334
Employed	−0.121***	0.1834***	0.0649**	−0.0761***	0.0146	0.0469*
Unemployed	0.0081	−0.0697**	−0.0227	0.0446	0.0037	−0.0175
Disabled	−0.0391	−0.0484*	−0.0345	−0.0617**	0.0898***	−0.0646**
Retired	0.2009***	−0.1226***	−0.0583**	0.0785***	−0.0871***	−0.0002

Significance is represented by *p < .1, **p < .05, ***p < .01.

male was positively and significantly correlated with the size of the preference share, or relative prioritization of, health care, childcare, transportation, and other necessities, but negatively correlated with prioritization of household resource allocations to housing. There were a number of significant correlations amongst the age groups and budget categories. Related to health care, the youngest two categories (18 to 44 years old, combined) had significant and negative relationships. Comparatively, the oldest age group had a positive correlation with health care. The relationships between budget category preference share and age were also intuitive for childcare. Being 25 to 44 years old was positively related to the relative prioritization for childcare, while being 45 or older was negative. Being 25 to 44 years old was positively correlated with the size of the

preference share for transportation and being 45 or older was negatively correlated.

Two age groups were found to be significantly correlated with the size of the preference share for food. Being 25 to 44 was negatively correlated with the size of the preference share for food, while being 65 years old and older was positively correlated. The age group 25 to 44 assigned lower prioritization of spending on food and would suggest a trade off of resources away from food and towards other expenditure categories. The older three age groups had significant correlation with the size of preference share for housing. Being 25 to 44 and 65 or older were both negatively correlated with the importance of the housing budget category; those 45 to 64 were positively correlated with housing.

Primarily three budget categories had significant correlations with household income categories. Low income was negatively correlated with the size of preference share for the budget categories health care and childcare, but was positively correlated with housing. In contrast, high income was positively correlated with the size of preference share for health care and childcare and negatively correlated with housing.

Studying individual-specific preference shares from the RPL model provides more insight into the relationship between children and household resource allocations. Having at least one child in the household was negatively correlated with the size of preference share for health care and housing, and was positively correlated with childcare, transportation, and other necessities. Contrariwise, not having children was negatively correlated with the size of the preference shares for childcare and transportation, and had a positive relationship with housing. Having a college degree was positively correlated with the size of preference share for childcare and negatively with housing. With respect to respondent employment, having employment was negatively correlated with the size of preference share for health care and food, but was positively correlated with the size of preference share for childcare and transportation.

Individual-specific preference shares were also correlated with responses to questions designed to understand the nature of each budget category, and to explore how certain components of one budget category can impact another (**Table 5**). Because budget allocation involves *all* household resources, the impact of each type of resource entering a household was investigated. Households having indicated they received money from employment were positively correlated with the importance of the budget categories childcare, transportation, and housing, but negatively correlated with the relative importance of health care and food. Relative importance of childcare and transportation were also positively correlated with receiving money from child support, furthering the understanding of the relationship between children and household budget allocation.

Receiving money from family was positively correlated with the size of the preference shares for childcare, transportation, food, and other necessities, but negatively correlated with housing. Money received from disability was negatively correlated with the size of preference share for childcare and food, but

Table 5. RPL Preference Shares Correlated with Home Ownership Arrangement.

	% of Sample	Health Care	Childcare	Transportation	Food	Housing	Other
Household Receives Money From:							
Employment	56	−0.1319***	0.0964***	0.0675**	−0.0697**	0.0498*	0.0418
Child Support	03	−0.0212	0.0551*	0.0777***	0.0151	−0.0394	0.0357
Family	01	0.0321	0.0633**	0.0657**	0.056**	−0.1017***	0.1121***
Disability	10	−0.0445	−0.0523*	−0.0087	−0.0616**	0.0795***	−0.0012
Social Security	32	0.2436***	−0.144***	−0.0655**	0.0983***	−0.1073***	−0.0194
Pension	20	0.2281***	−0.0989***	−0.0256	0.1366***	−0.1546***	0.0336
Housing Considerations							
Rent Housing	22	−0.1600***	−0.0262	−0.0670**	−0.1205***	0.1841***	−0.0826***
Single Family	05	−0.0734***	0.0051	−0.0177	−0.0124	0.0510*	−0.0405
Town House	02	−0.0511*	−0.0017	0.0616**	−0.0423	0.0309	0.0529*
Duplex	01	0.0166	0.0125	0.0192	−0.0279	−0.0005	0.0001
Apartment	12	−0.1161***	−0.0288	−0.0747***	−0.1145***	0.1597***	−0.0713**
Condo	01	−0.0173	0.0401	0.1027***	−0.0239	−0.027	0.0978***
Own Housing	76	0.1565***	0.0476*	0.0908***	0.0823***	−0.1748***	0.0948***
Single Family	66	0.1175***	−0.0275	0.0332	0.0794***	−0.1084***	0.0563**
Town House	03	0.0413	0.0730***	0.0736***	0.0048	−0.0755***	0.0697**
Duplex	02	0.0731***	0.0695**	0.0622**	0.0242	−0.0962***	0.0505*
Apartment	02	0.0127	0.1694***	0.172***	−0.0395	−0.0996***	0.1259***
Condo	03	0.0582**	−0.0047	0.0356	−0.0211	−0.0189	−0.0182
Transportation Considerations							
Owns at Least 1 Car	91	−0.0735***	−0.0326	−0.062**	−0.0253	0.0821***	−0.0454
Transportation Used at Least Once a Week							
Bus	11	0.0364	0.2722***	0.1849***	0.0026	−0.184***	0.1701***
Carpool	10	0.0390	0.2231***	0.2229***	0.0271	−0.1943***	0.2131***
Taxi	10	0.0651**	0.3874***	0.2127***	0.0053	−0.2538***	0.202***
Bicycle	13	0.0419	0.2972***	0.1727***	0.0288	−0.2086***	0.1663***
Walk	45	0.0531*	0.1929***	0.0197	0.0109	−0.1168***	0.0458
Personal Vehicle	93	0.0443	0.0273	0.0445	−0.0200	−0.0316	0.0157
Skates	07	0.0765***	0.2264***	0.2607***	0.0325	−0.2257***	0.2211***
Car Service	08	0.0738***	0.0207	0.0628**	−0.0140	−0.0551*	0.0454
Health Care Considerations							
Has Insurance	95	0.0963***	−0.0221	−0.1103***	−0.0725***	0.0321	−0.0565**
A Beneficiary	09	0.0116	0.1411***	0.1651***	−0.0227	−0.0956***	0.119***
Affordable Care	06	−0.0119	0.0014	0.0981***	0.0119	−0.035	0.099***
Medicare	28	0.1737***	−0.0487*	−0.0232	0.0726***	−0.1064***	0.0091

Continued

Medicaid	11	−0.0706**	0.0188	0.0370	−0.0087	0.0192	0.0443
Private	14	0.1729***	0.0838***	−0.0325	0.0744***	−0.1621***	0.0498*
Employer provided	44	−0.0923***	0.0012	−0.0535*	−0.1045***	0.1302***	−0.0952***
None	05	−0.094***	−0.0219	0.1322***	0.0873***	−0.0301	0.0625**
				Food Considerations			
Food Insecure	25	−0.0506*	0.1554***	0.1940***	−0.0428	−0.0646**	0.1223***
High Food Security	65	0.0544*	−0.161***	−0.1709***	0.0332	0.0625**	−0.0987***
Marginal	10	−0.0134	0.0318	−0.0083	0.0089	−0.0062	−0.0196
Low	10	−0.0185	0.0861***	0.0481*	−0.0266	−0.0157	−0.0114
Very Low	15	−0.0457	0.1162***	0.1938***	−0.0296	−0.0647**	0.1564***

Significance is represented by *p < .1, **p < .05, ***p < .01.

positively correlated with the size of preference share for housing. Social security money was positively correlated with the preference share size for health care and food, but negatively correlated with childcare, transportation, and housing.

Respondents were asked to select the housing option that best described their residence. While housing has the highest mean preference share, owning a home was significantly negatively correlated with the size of preference share for housing. Renting, on the other hand was positively correlated with the size of preference share for housing, most notably for renting an apartment. Generally, size of preference shares for health care and food were negatively correlated with renting and positively correlated with owning. Owing one's home was positively correlated with prioritization of childcare where as renting was not significantly correlated.

In regards to transportation, having at least one car was negatively correlated with the size of preference share for health care and transportation, but positively correlated with housing. Using a bus, using a carpool, and using a bicycle at least once a week was positively correlated with the importance of the budget categories childcare, transportation, and other necessities, but negatively correlated with the size of preference share for housing. Taking a taxi at least once a week was positively correlated with health care, childcare, transportation, other necessities, and negatively correlated with housing. Walking was positively correlated with the relative importance placed on health care and childcare, but negatively correlated with importance of housing.

In order to better understand health care budget considerations, respondents were asked about the nature of their insurance. Insurance coverage varies and what remains of a health bill may be out of pocket expenses that could take resources away from other budget categories. Interestingly, having health insurance of any kind was positively correlated with the size of preference share for health care and negatively correlated with the size of preference share for transportation, food, and other necessities. While having health insurance was nega-

tively related to the food budget preference share, having no insurance was positively related. Being a beneficiary of someone else's health insurance was positively correlated with the level of importance placed on childcare, transportation, and other necessities, and was negatively correlated with housing. Having public insurance through the Affordable Care Act was positively correlated with the size of the preference share devoted to transportation and other necessities. Having private (non-employer provided) health insurance was positively correlated with the relative importance placed on health care, childcare, food, and other necessities, and was negatively correlated with housing. Employer provided insurance was negatively correlated with the size of preference share for health care, transportation, food, and other necessities, but was positively correlated with housing. Having no insurance was negatively correlated with the size of preference share devoted to health care, transportation, food, and other necessities, and was positively correlated with relative importance placed on housing.

Food insecurity status was determined using the ten food security assessment questions developed by the United States Department of Agriculture (Coleman-Jensen et al., 2015). Food insecurity in a household was positively correlated with the size of preference share, or priority of budget category, for childcare and transportation, but negatively correlated with housing. For both the low and the very low food secure households there was a significant and positive relationship with the relative importance placed on childcare, transportation, and other necessities, but negative correlation with housing.

4. Discussion

Considering housing expenditure composed the largest segment of the 2015 Consumer Expenditures Survey (USBLS, 2016 [2]), it was hypothesized that housing would have priority preference over other budgeting categories. Within the LCM, housing was the most important category for two of the four classes. Housing was also the largest preference share in the RPL model. In other words, household resources (money) allocated to housing needs are often done at the sacrifice of other categories. In short—and unsurprisingly—in order to allocate funds to housing, households must often allocate away from other spending. The large preference share for housing, agrees with the findings of Kalwij & Salverda (2007) who found that in the Netherlands, the budget shares for clothing and footwear, and food and beverages were decreasing while budget shares for housing were increasing (Kalwij & Salverda, 2007).

The relationship between housing and other budgeting categories is complicated further depending on if the housing is owned or rented. Overall, it seemed that reporting that one's home was rented was correlated with placing more emphasis or importance on housing as a budgetary/household spending category, whereas owning a home was correlated with placing less emphasis or priority. Also, size of preference shares for health care and food were negatively corre-

lated with renting and positively correlated with owning. This could suggest that renters trade away from these categories, and toward housing, when forced to make budgeting decisions. A similar relationship was reported by Pollack et al. (2013), who analyzed data from a survey of Pennsylvania residents. It was found that respondents who reported housing unaffordability were more likely to report self-rated poor health and cost-related healthcare non-adherence, and the effects of these findings were greater among renters than homeowners (Pollack et al., 2013). Childcare was also positively related to owning a home, which may potentially suggest that owning a home allows people to shift resources toward childcare. Alternatively, owning a home may be related to other household financial or asset-related situations that enable greater focus towards childcare spending. In other words, it is likely not home ownership itself which facilitates prioritization of childcare, but rather home ownership may be acting as a proxy for financial stability or other factors deserving of future study. Thus, it is important to understand that renters and homeowners budget, and make tradeoffs among spending categories, in different ways.

The relationship between the low income group and health care is reflective of Brown et al. (2014) who found lower income respondents were less likely to seek health care. Further, the relationship between age and prioritization of health care spending is also reflective of Brown et al. (2014) who found that catastrophic health expenditures were more likely to occur with the elderly. Having at least one child in the household was negatively correlated with the size of preference share for health care, converse to Branrup & Mance (2011). The relationship between relative prioritization of health care and insurance coverage is complicated. While having insurance was in some cases (such as having private non-employer provided health insurance) positively related to the level of importance placed on health care, employer provided insurance was negatively related. Thus, it appears that simply having coverage is not the only factor influencing budgetary allocations; indeed, how one came to have insurance coverage appears to impact the relative prioritization of spending on health care. Similar to the previous discussion surrounding home ownership serving as a proxy for other household attributes, perhaps the path in which one obtained reported health coverage is capturing other related factors. For example, employment which offers health insurance as a benefit is also likely to offer other benefits (e.g., childcare assistance) which may impact a household's perceptions of budgetary importance of various categories.

Households with lower incomes experience financial shocks that require more days of income to recover from than households with higher income; those with incomes under $25,000 experience shocks that require a median of 31 days of income to recover from, while those with $85,000 experience shocks that require a median of 10 days (McGarth, 2016) (PEW, 2015). How households allocate financial resources, and prioritize their spending, is an important topic with broad-reaching impacts, including the ability of the household to plan for and

recover from financial shocks. Consider when household income fails to cover a financial shock such as unexpected medical expenses, car repair, or other unexpected emergencies. Shocks requiring significant financial recovery periods may influence spending in other categories, leading to potential impacts on local economies. For example while recovering from the shock rent may be unpaid or other expenses may be delayed, and these choices are based on the relative preferences of other attributes in their budget.

The positive relationship between preference shares for transportation and health care may be partially related to the need for travel to and from doctor's appointments and/or the potential for increased travel needs for managing health conditions, including trips to/from specialty stores or even for specialty diets. The relative importance of food was also positively correlated with the size of the preference share, or relative importance placed on, transportation. The positive relationship between budgetary allocations to transportation and childcare is reflective of Brandrup & Mance (2011), who found that as childcare expenditures increase so do transportation expenditures. The priorities of households with income from employment for transportation are intuitive since transportation is often necessary for continued employment. Generally, relationships with transportation may be intuitive in that transportation is needed to obtain food, see one or multiple doctors, transport one or multiple children, and participate in other activities, yet at the most basic level, transportation may be relatively less important than maintaining shelter (a home). The positive relationship of preference for this budget category with middle age range are intuitive because the ages 25 to 44 are within common child bearing years and give cause to dedicate resources to childcare. For respondents aged 45 and older it could be expected that the need for childcare would be substantially lower. Relative prioritization of transportation and age follow the same relationships as with childcare which reinforces the understanding that meeting the needs of a child (day care, school, food, diapers, pediatrician visits) require reliable transportation. Housing education, incentive and support programs, and housing policy should be mindful of the influence of housing on other expense needs. Social development programs may need to integrate housing within their delivery mechanisms, even beyond those that focus on homelessness. If housing is improperly managed or misunderstood, a person's health, food security, childcare security, transportation access, and ability to meet other needs may be reduced. Programs designed for education in managing the provision of childcare resources may wish to include discussions about transportation expense management. Public and private childcare aid programs could be strengthened if transportation considerations were added to the available benefits.

Programs dedicated to improving the status of at-risk households may need to be more holistic in their approach, given the relationships between resource allocation discovered amongst categories. Finding that there was not a significant relationship between preferences for food budget and food insecure respondents

is potentially puzzling and invites further research. One possible explanation is that food insecure respondents may not have money for food, and rely on food banks for food. Consider the positive relationships between relative importance placed on food in the household budget and owning a home or between the food budget importance and not having health insurance. Given the findings surrounding tradeoffs made by households with various food security statuses, programs designed to aid those in need may have to broaden the scope of aid since hardships in one budgetary category are significantly related to appropriations in other areas of household spending.

5. Conclusion

Housing was ranked as the most important monthly budget category (received the highest preference share) amongst Midwestern respondents studied. The largest class of respondents (48%) valued housing first, assigning a mean preference share of 79.5%. Housing is an impactful budget category and influences many other aspects of an individual's resource allocation, often negatively. Food and health care were the most important categories for the fourth latent class segment and had positively correlated preference shares. The relationship between food and health care is not surprising since food can be seen as a health initiative and diet changes are often components of illness and disease management. However, having insurance was negatively correlated with relative importance placed on food in the household budget, while not having insurance was positively correlated. Future studies should investigate further tradeoffs between insurance access and perceptions of food in health management. The prioritization of the food budget was not significantly correlated with food security or insecurity, but the status of one's food security was, in some way, correlated with all other budgeting categories. Further studies should consider the impact of all other budgeting categories on food security. Greater understanding of this could affect the design and implementation of policy and aid related to food. Further studies could also involve the homeless and similarly situated vulnerable populations to explore their budgeting preferences, which can inform further policy.

Conflict of Interest

The authors declare there is no conflict of interest.

Ethics Statement

The survey utilized in this study was approved by the Social Sciences Institutional Review Board (IRB) Human Research Protection Program (IRB Protocol Number 1602017146).

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