

Grocery expenditure Data Analysis

Yuting Chen

Jiali Chen

Jung-a Kim

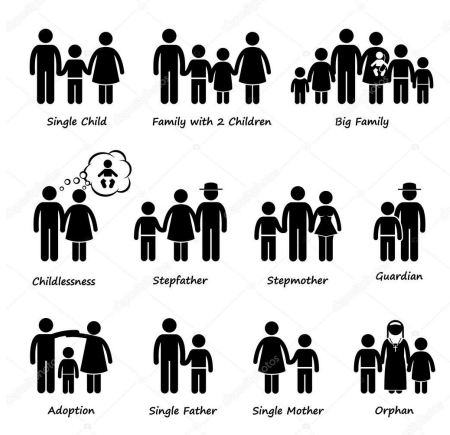
Dong Lin



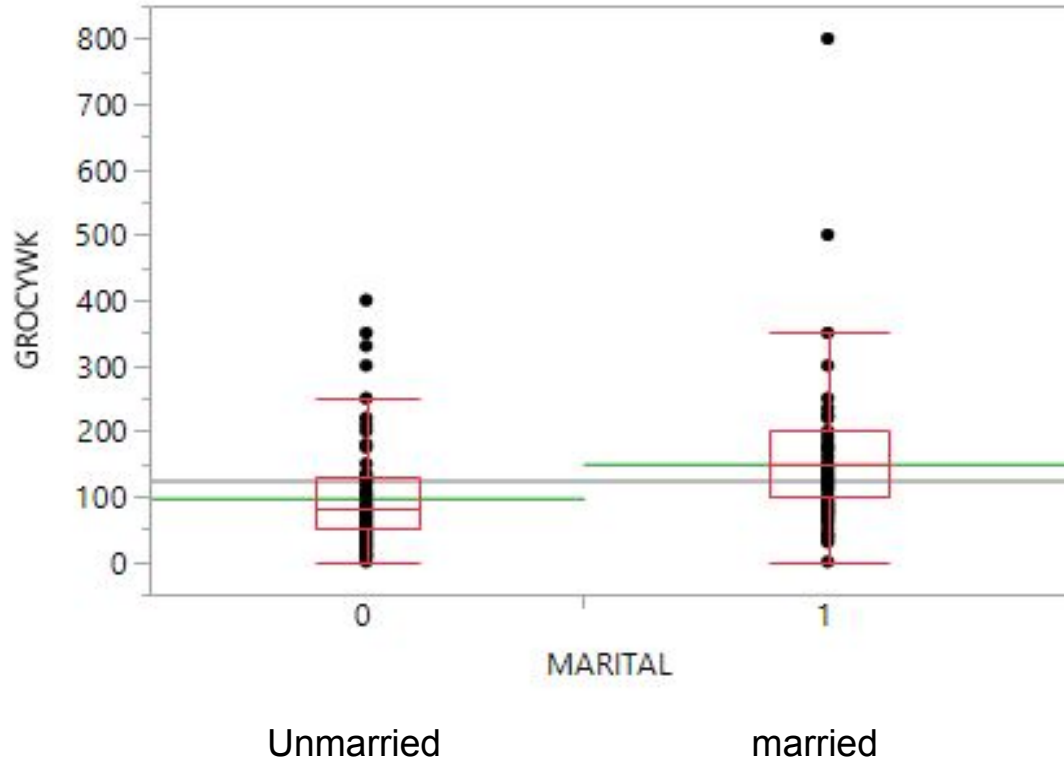
Question:

1. Does a reference person's marital status affect the household's weekly grocery expenditure?
2. If it does, what other factors could affect the weekly grocery expenditure?
3. What information do we need to predict the average weekly grocery expenditure?
4. Could one type of information depend on another?

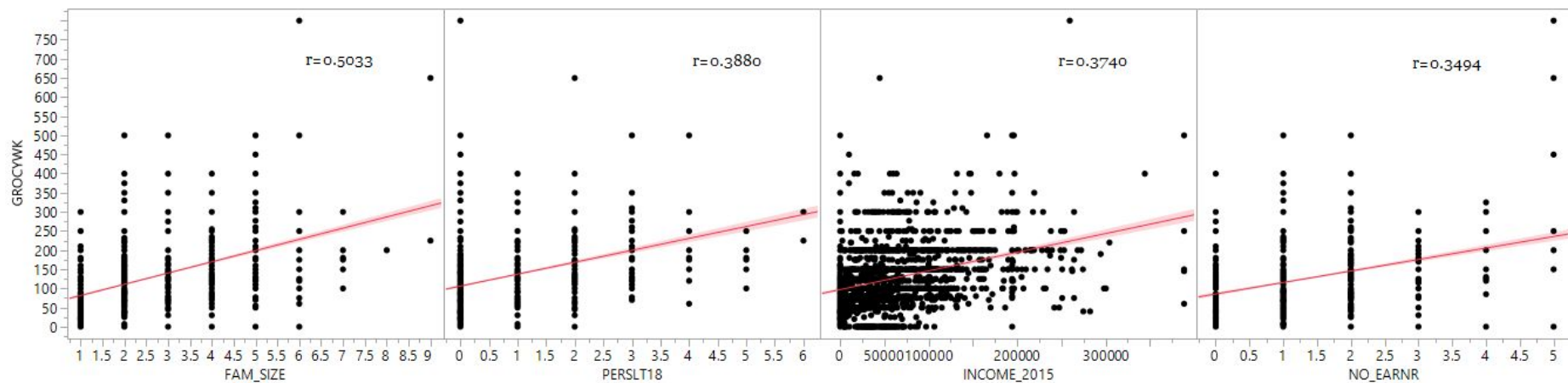
Variables:



Two independent sample t-test:



Check Outlier:



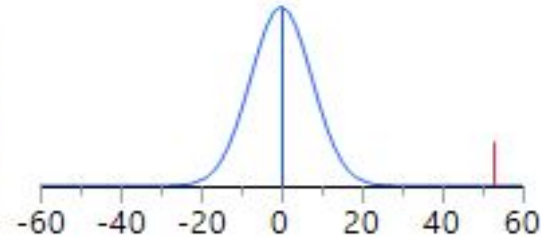
Conclusion to two independent sample t-test:

t Test

1-0

Assuming equal variances

Difference	52.6198	t Ratio	6.973455
Std Err Dif	7.5457	DF	477
Upper CL Dif	67.4468	Prob > t	<.0001*
Lower CL Dif	37.7928	Prob > t	<.0001*
Confidence	0.95	Prob < t	1.0000



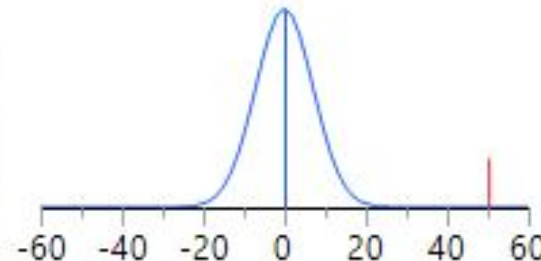
With Outlier

t Test

1-0

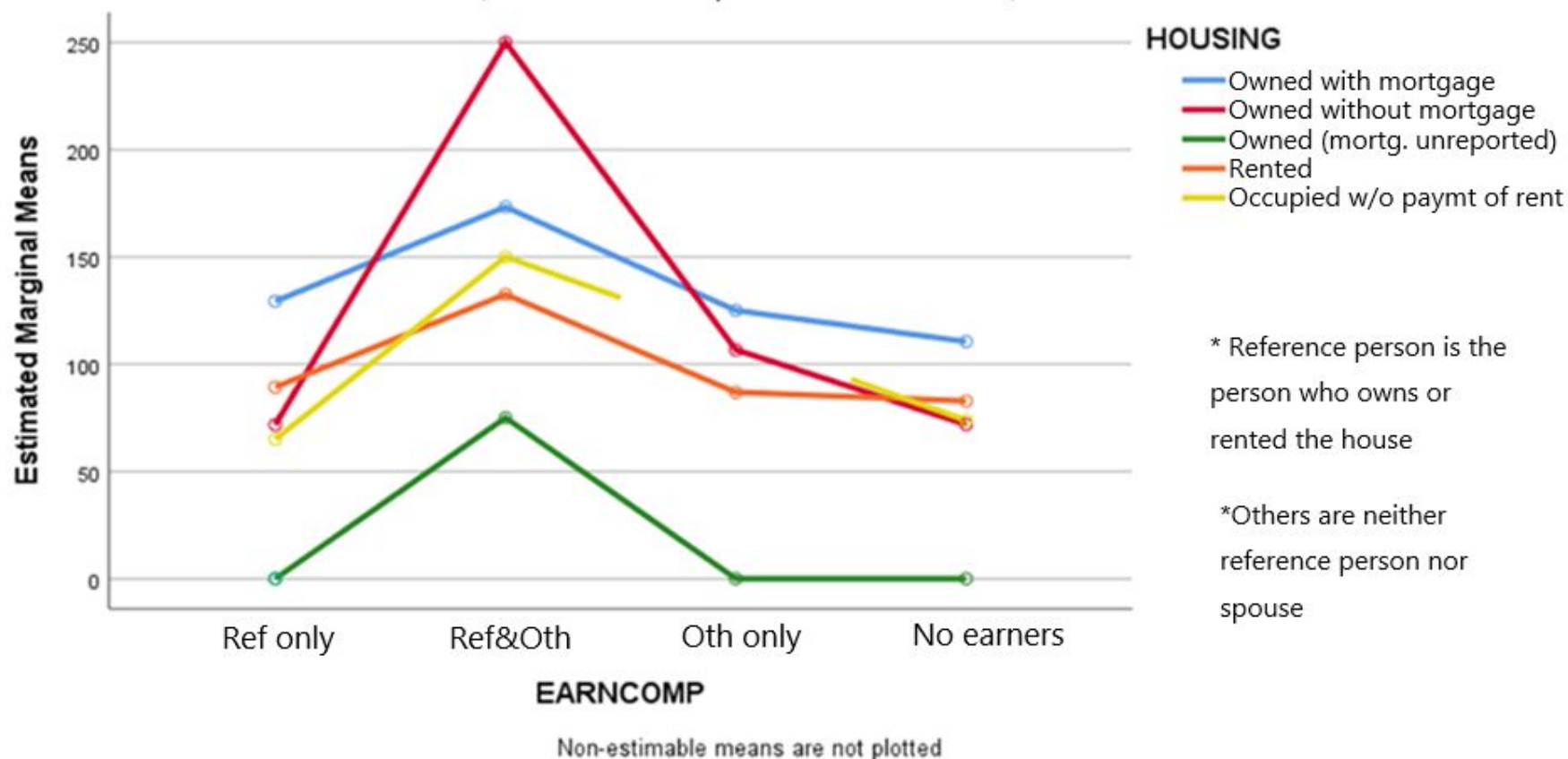
Assuming equal variances

Difference	50.0500	t Ratio	7.101091
Std Err Dif	7.0482	DF	476
Upper CL Dif	63.8995	Prob > t	<.0001*
Lower CL Dif	36.2006	Prob > t	<.0001*
Confidence	0.95	Prob < t	1.0000



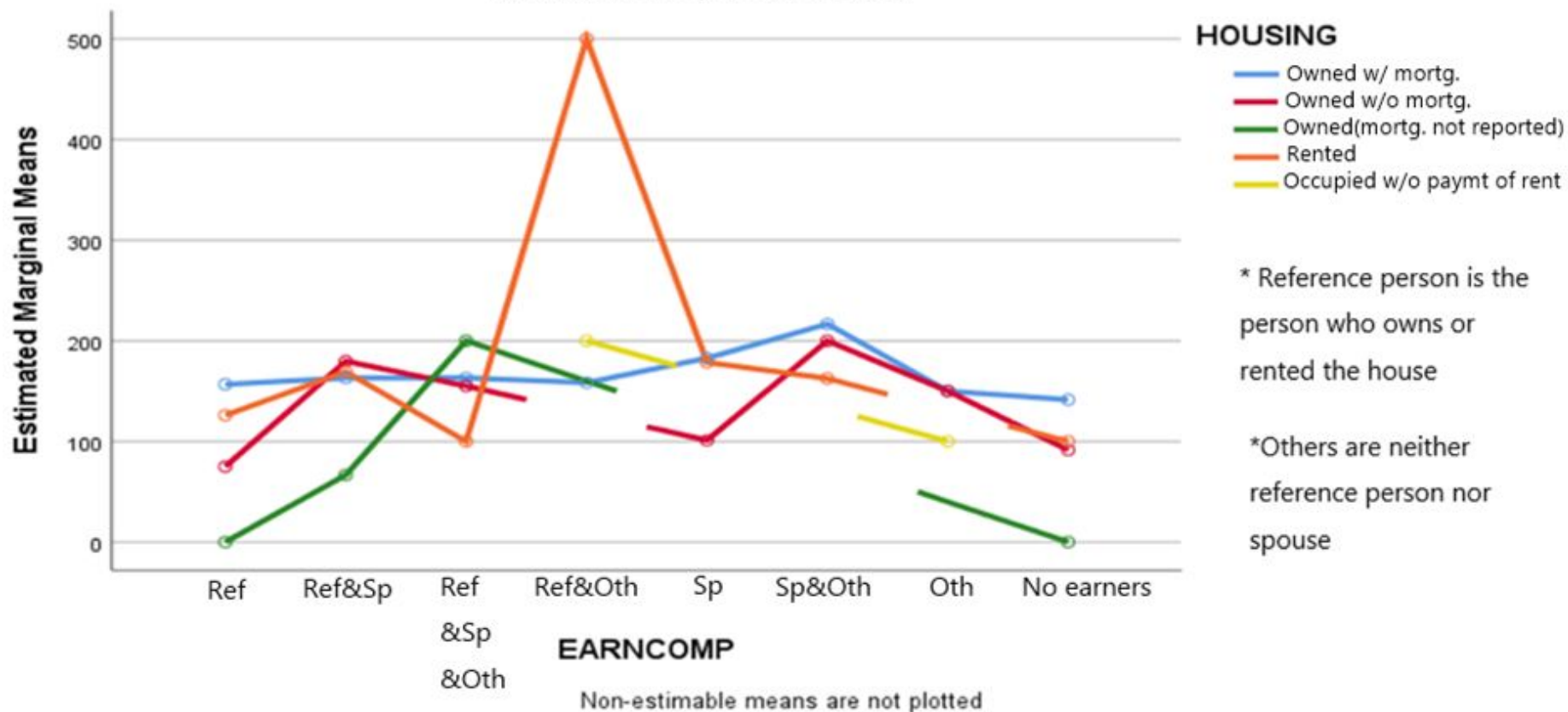
Without Outlier

Estimated Marginal Means of GROCYWK
(When reference person is not married)

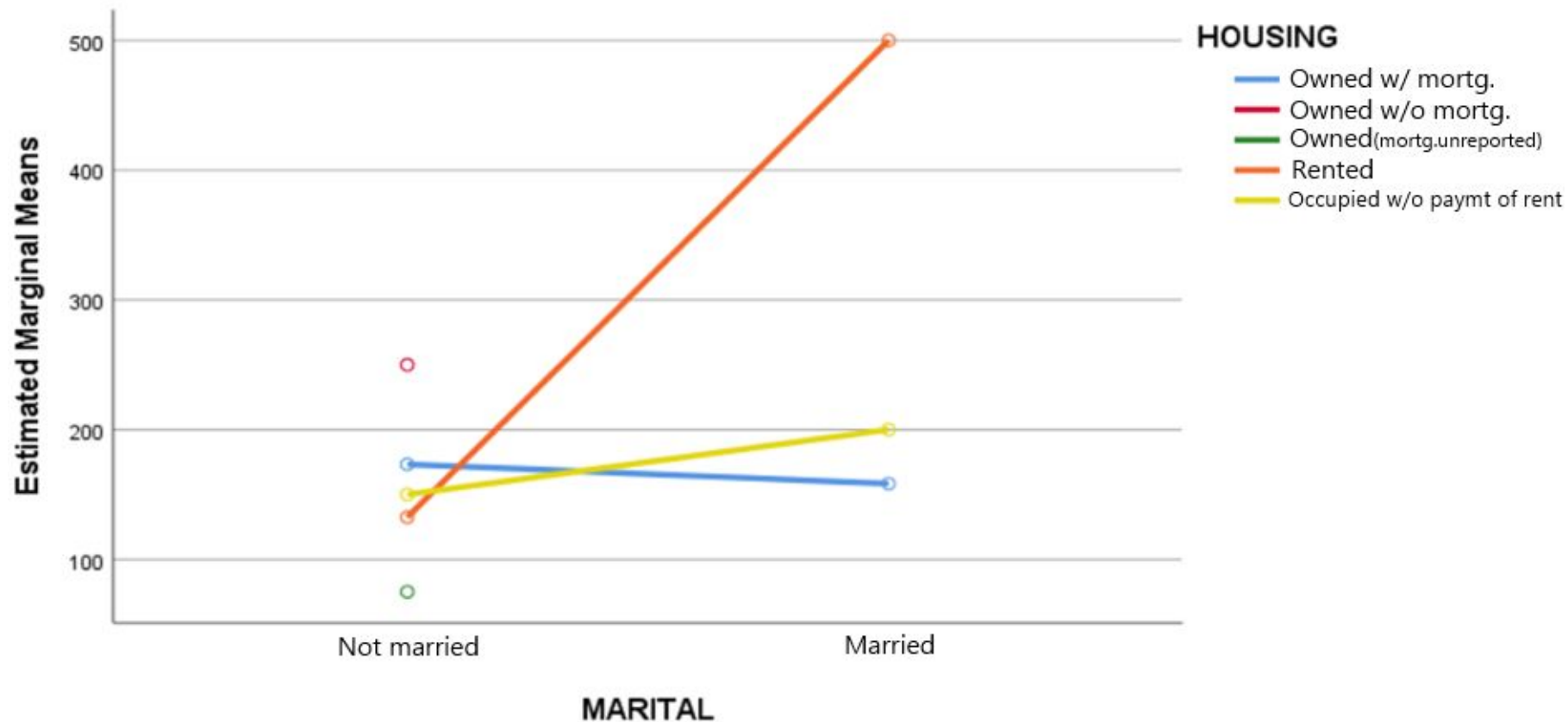


Estimated Marginal Means of GROCYWK

(When reference person is married)



Estimated Marginal Means of GROCYWK
(When reference person and others are earners)

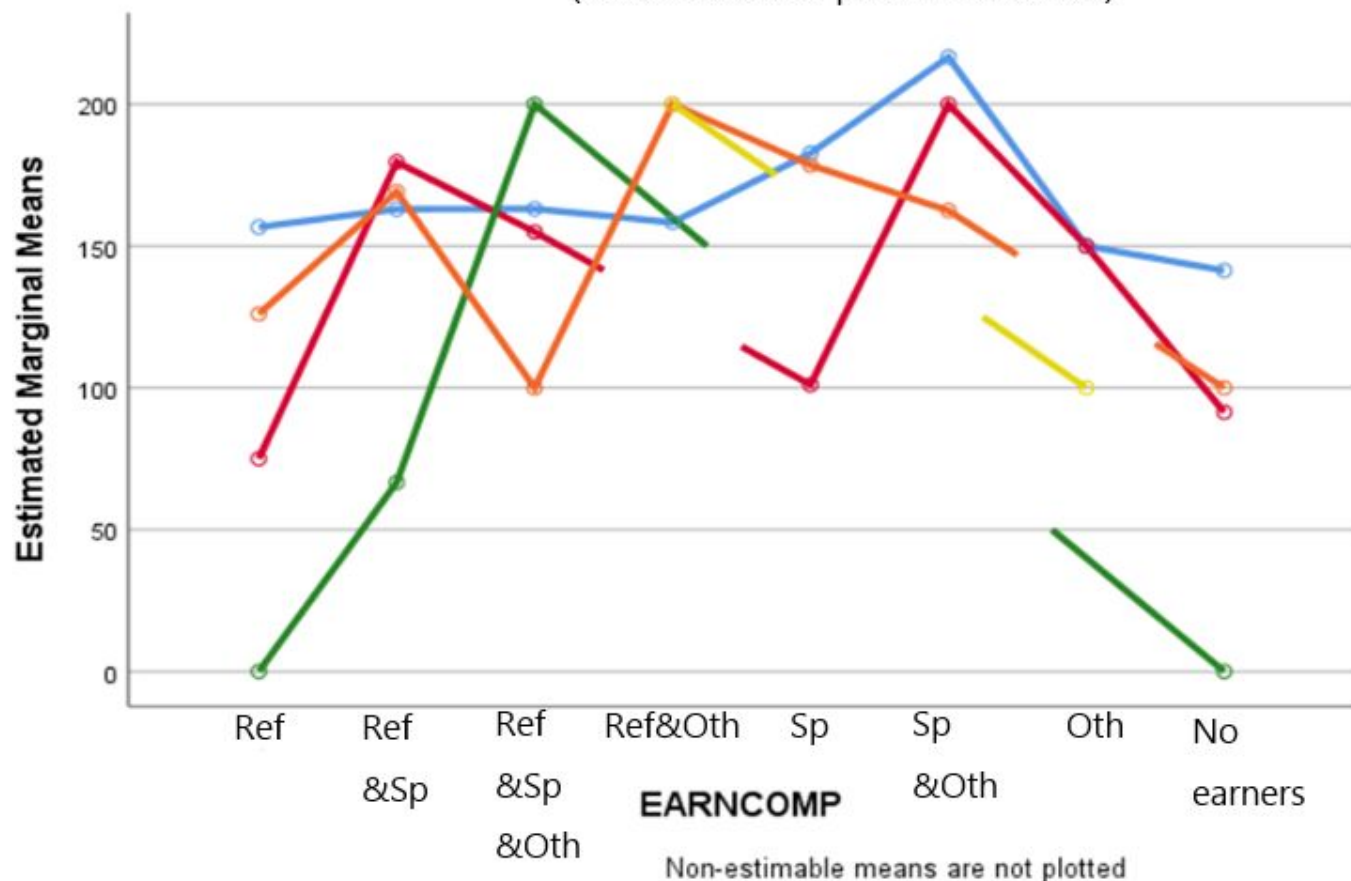


Non-estimable means are not plotted

Outlier excluded

Estimated Marginal Means of GROCYWK

(When reference person is married)



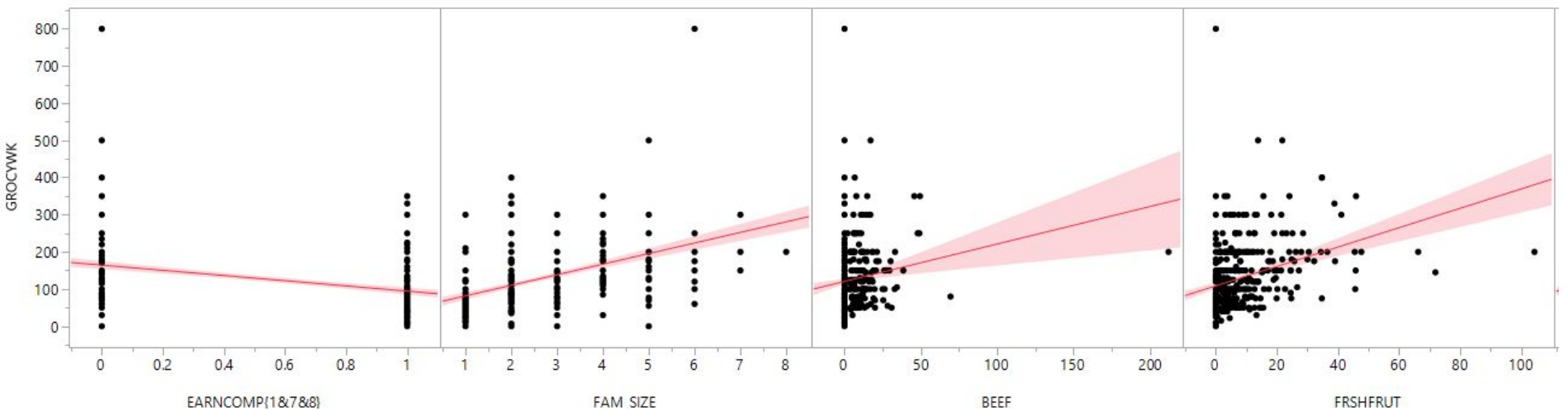
HOUSING

- Owned w/ mortg.
- Owned w/o mortg.
- Owned (mortg. not reported)
- Rented
- Occupied w/o paymt of rent

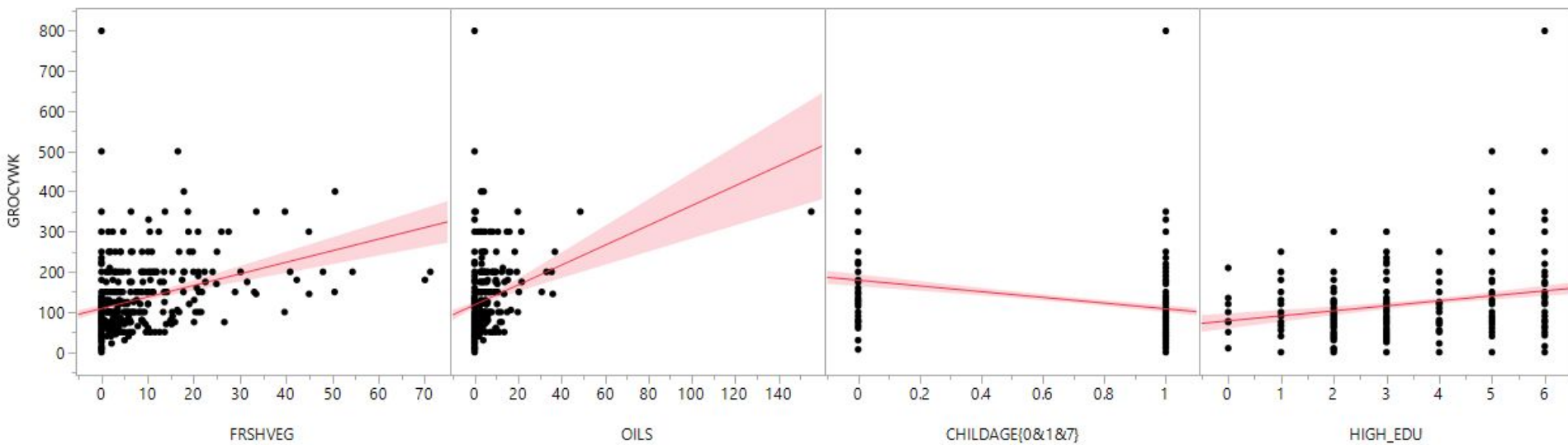
* Reference person is the person who owns or rented the house

*Others are neither reference person nor spouse

GROCWK



GROCWK



- With the outlier

$$\begin{aligned}\text{Log[GROCYWK]} = & 4.156 \\ & +0.149(\text{FAM_SIZE}) \\ & +0.009(\text{FRSHVEG}) \\ & +0.005(\text{OILS}) \\ & +0.063(\text{HIGH_EDU}) \\ & -0.248(\text{EARNCOMP}\{1\&7\&8\})\end{aligned}$$

35.4%

- Without the outlier

$$\begin{aligned}\text{Log[GROCYWK]} = & 4.191 \\ & +0.156(\text{FAM_SIZE}) \\ & +0.073(\text{HIGH_EDU}) \\ & -0.288(\text{EARNCOMP}\{1\&7\&8\})\end{aligned}$$

32%

*EARNCOMP{1&7&8}=1 If earner is Reference person only OR Others(not spouse) OR No earners
EARNCOMP{1&7&8}=0 Otherwise

Using EARNCOMP, HOUSING, & FAM_SIZE

- With the outlier

$$\begin{aligned}\text{Log[GROCYWK]} = & \\ & 4.113 \\ & +0.216(\text{HOUSING}[1]) \\ & +0.199(\text{HOUSING}[2]-0.242)*(\text{FAM_SIZE}-2.588) \\ & +0.209(\text{FAM_SIZE})\end{aligned}$$

29%

- Without the outlier

$$\begin{aligned}\text{Log[GROCYWK]} = & \\ & 4.123 \\ & +0.186(\text{FAM_SIZE}) \\ & +0.2564375(\text{HOUSING}[1])\end{aligned}$$

26.2%

*HOUSING[1]=1 If the family owns a house with mortgage, 0 Otherwise

*HOUSING[2]=1 If the family owns a house without mortgage, 0 Otherwise

Thank you for listening

Citation

Data and graphs

U.S. Department of Labor, Bureau of Labor Statistics, Consumer Expenditure Survey, Diary Survey, April 10, 2018. https://www.bls.gov/cex/pumd_data.htm#csv

U.S. Department of Labor, Bureau of Labor Statistics, Consumer Expenditure Survey, 2016 Consumer Expenditure Surveys Microdata Diary Documentation, August 29, 2017. <https://www.bls.gov/cex/2016/csxdiary.pdf>

U.S. Department of Labor, Bureau of Labor Statistics, Consumer Expenditure Survey, 2016 Diary Data Dictionary, Wednesday, September 13, 2017. <https://www.bls.gov/cex/2016/csxdiarydata.pdf>

U.S. Department of Labor. Bureau of Labor Statistics. Division of Information and Marketing Services. (February 25, 2016). *Consumer Expenditures and Income: Collections & Data Sources: Diary Survey details*. <https://www.bls.gov/opub/hom/cex/data.htm>

U.S. Department of Labor. Bureau of Labor Statistics. Division of Information and Marketing Services. (February 25, 2016). *Consumer Expenditures and Income: Concepts*. <https://www.bls.gov/opub/hom/cex/concepts.htm>

SAS Institute Inc. 2017. *Using JMP® 13*. Cary, NC: SAS Institute Inc.

IBM Corp. Released 2017. IBM SPSS Statistics Subscription for Microsoft Windows 64-bit, build 1.0.0.1012. Armonk, NY: IBM Corp.

Images

Mittmac, Pixabay, April 22, 2016, <https://pixabay.com/en/groceries-fruit-vegan-soy-food-1343141/>

GDJ, Pixabay, Feb. 1, 2017, <https://pixabay.com/en/cranium-head-human-people-persons-2028555/>

By Unknown - <http://www.bls.gov>, Public Domain, <https://commons.wikimedia.org/w/index.php?curid=5223432>

Leremy, "Family Size and Type of Relationship Stick Figure Pictogram Icon Cliparts", *Depositphotos*, Apr 15, 2014, <https://depositphotos.com/44659467/stock-illustration-family-size-and-type-of.html>

The Raw Herbalist, Liz Bunting, Dec 6, 2017, <https://therawherbalist.com/2017/12/the-truth-about-fruit/>

Lobel's of New York, https://cdn-tp1.mozu.com/17461-27355/cms/27355/files/bf7ef854-c90b-4683-be13-d4332ad533ac?max=650&_mzcb=1525971069165

Vasa Dvrlists, *ODYSSEY*, Patricia Aglio, Sep 5, 2016, <https://www.theodysseyonline.com/why-age-not-just-number>

Shelby County Schools, <http://www.scsk12.org/schools/adolescent.alt/site/images/images.jpg>

Efficient Bazaar, <http://shop.efficientbazaar.com/index.php/groceries/oil-ghee/frymore-refined-oil-15-ltr.html>

ELL 3, https://ell3shank.weebly.com/uploads/5/7/4/3/57437647/220543043_orig.png