



The Association Between Income, Binge Drinking Frequency and Parental Military Status



, Quantitative Analysis Center, Wesleyan University

Introduction

- In 2024, 178,000 Americans died from alcohol related causes. According to the CDC, this number has been increasing annually since 2016, with a 29% growth from 2016 to 2024 (Centers for Disease Control and Prevention [CDC], 2024)
- Civilian household incomes over \$75,000 are positively associated with frequency of alcohol consumption (CDC, 2011).
- The average annual income of a military household is greater than that of a civilian household, and moreover it is greater than \$75,000 (Hosek & Wadsworth, 2013)
- Despite this, children & siblings of US service members have higher rates of alcohol consumption than children & siblings with no familial association to the military (Williamson, et. al., 2018).
- However, no study exists examining the relationship between *binge drinking* frequency in offspring of US service members
- Income: Junior/Mid-level US enlisters are a unique population that lay under the \$75,000 income threshold but are also active military personnel available for deployment, conditions associated with a child's binge drinking frequency
- The gap in the literature on the relationship between income and binge drinking in military populations makes it difficult to predict how a parent's military status might differ from the know association between civilian income and binge drinking.

Methods

Sample

- The sample consists of 3,908 non-institutionalized US citizens aged 12 and older pulled from the 2024 NDSUH survey who reported having or not having a parent in active military service (population of 70,241 completed interviews)

Measures

- Binge Drinking was defined as 5/4 or more drinks for men and women within an hour by the NSDUH survey and NIAA (National Institute on Alcohol Abuse and Alcoholism [NIAAA], 2024).
 - Respondents reported whether they had or had not binge drank in the past 30 days at the time of the survey
- Respondents annual income was measured as over or under the \$75,000 mark identified by the CDC (0 for \$74,999 or less, 1 for \$75,000 or more)
 - Calculated by collapsing the seven categories in Stata
- Age was measured through NSDUH survey responses, ranging between 11 groups (1=12-13, 2=14-15, 3=16-17, 4=18-20, 5=21-23, 6=24-25, 7=26-29, 8=30-34, 9=35-49, 10=50-64, 65+)
- Sex was measure by NSDUH responses (male or female)

Research Questions

- Does the military status of a person's parent moderate the relationship between binge drinking frequency and household income?
- Does this relationship differ based on age?

Results

Bar Charts

- Visualizes a disparity in binge drinking instances, with offspring of civilian parents (Group 1) exhibiting a higher average frequency compared to offspring of military parents (Group 0)
- Annual income over \$75,000 shows slightly higher bar than under \$75,000
- visually much smaller than the military/civilian comparison
- Significance test needed

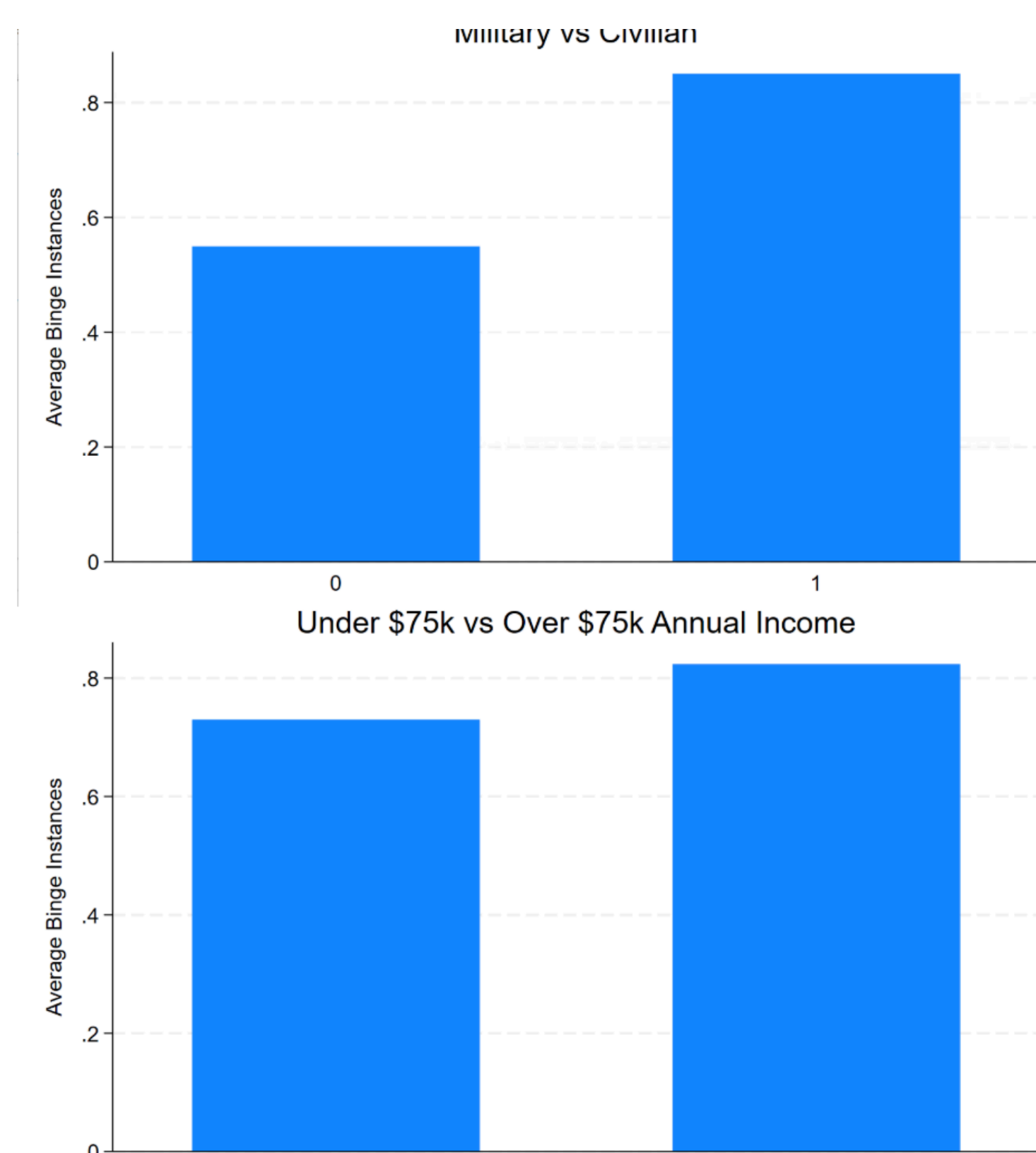


Figure 1. Univariate models for Income and parental military status

Summary of Bng30			
Mparent	Mean	Std. dev.	Freq.
0	.54929577	2.2435501	1,065
1	.85003579	2.9534014	2,794
Total	.76703809	2.7786664	3,859

Analysis of variance					
Source	SS	df	MS	F	Prob > F
Between groups	69.7402771	1	69.7402771	9.05	0.0026
Within groups	29717.827	3857	7.70490717		
Total	29787.5672	3858	7.72098684		

Analysis of variance					
Source	SS	df	MS	F	Prob > F
Between groups	8.1539651	1	8.1539651	1.06	0.3042
Within groups	29779.4133	3857	7.72097459		
Total	29787.5672	3858	7.72098684		

Bartlett's equal-variances test: $\chi^2(1) = 17.1472$ Prob>chi2 = 0.000

Figure 2. ANOVA test between binges and parental status (top) and income (bottom)

Figure 3. Regressions

Source	SS	df	MS	Number of obs
Model	917.229808	13	70.5561391	3,859
Residual	28870.3374	3,845	7.5085403	9,440
Total	29787.5672	3,858	7.72098684	

	F	Prob > F	R-squared	Adj R-squared	Root MSE
Model	9.05	0.0026	0.2354	0.2075	2.7402

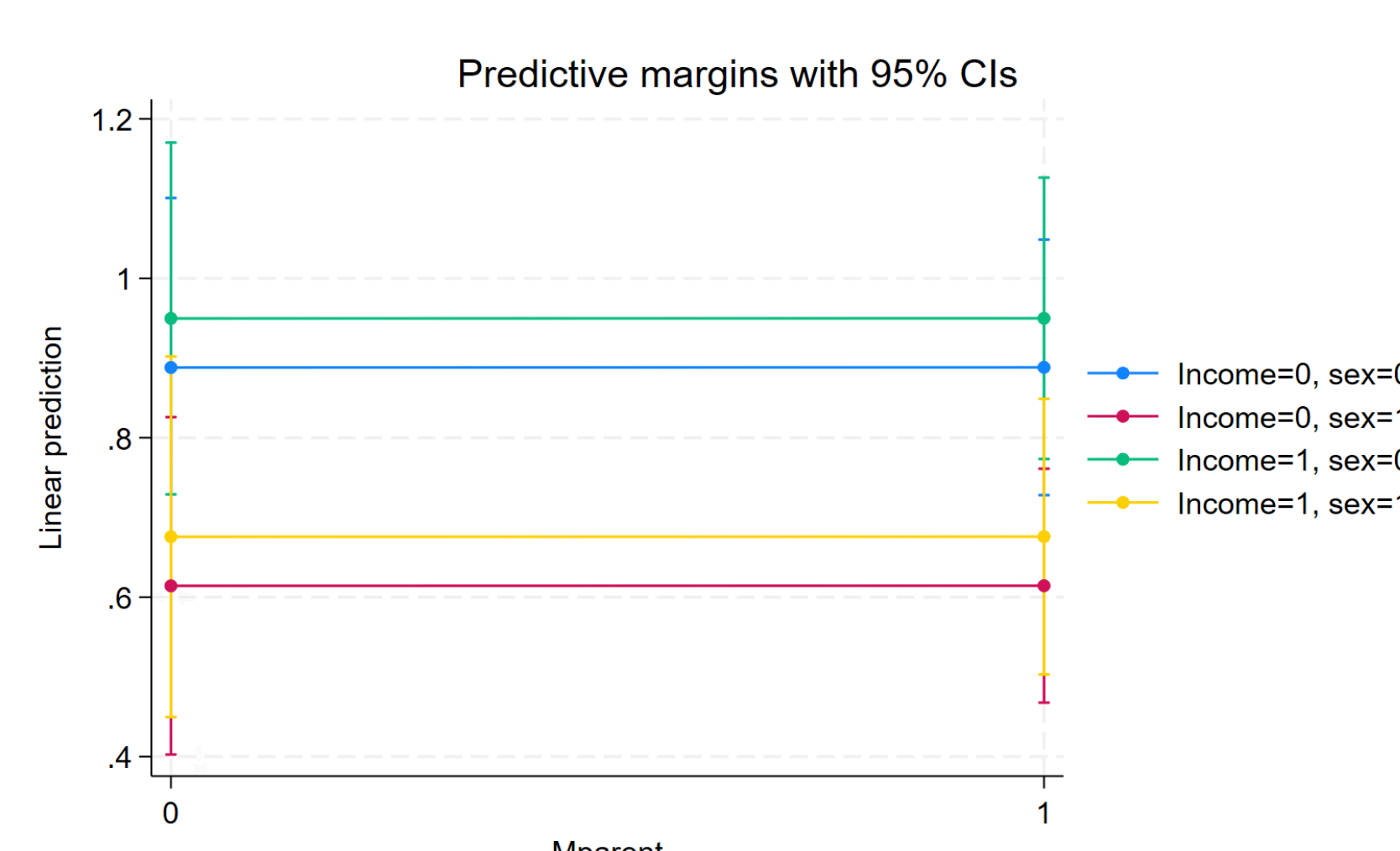
Bng30	Coefficient	Std. err.	t	P> t	[95% conf. interval]
1.Mparent	.0001823	.1096638	0.00	0.999	-.2148224 .2151871
1.Income	.0615142	.0907998	0.68	0.498	-.1165061 .2395346
1.sex	-.2738893	.0894909	-3.06	0.002	-.4493435 -.0984351
AGE3					
14-15	.0249281	.2129082	0.12	0.907	-.3924958 .4423519
16-7	.1697732	.2158688	0.79	0.432	-.2534551 .5930015
18-20	.6856532	.2102036	3.26	0.001	.273532 .1097774
21-23	1.27143	.2132967	5.96	0.000	.8532448 .1696916
24-26	1.016213	.2435047	4.17	0.000	.5389025 1.493524
26-29	1.106656	.2284585	4.84	0.000	.6587449 1.554568
30-34	1.334076	.2239029	5.96	0.000	.8950963 1.773056
35-49	1.166901	.1964427	5.94	0.000	.7817592 1.552043
50-64	.4748757	.2415824	1.97	0.049	-.0012338 .9485176
65+	.7883667	.2464747	3.20	0.001	.3051331 1.2716
_cons	-.1198004	.1696591	0.71	0.480	-.2128301 .4524309

Bivariate (figure 2)

- Offspring of civilian parents engaged in significantly more binge drinking episodes than offspring of military parents ($F=9.05$, $p=0.0026$)
- Household income did not have a significant impact on binge drinking frequency
- $F(1, 3857) = 1.06$, $p = .304$.
- Bartlett's $p < .001$, suggesting that while the averages are similar, the distribution of drinking behavior differs between the two income levels.

Multivariate (holding sex, income, parent and age constant at each level)

- Binge drinking increases significantly starting at age 18, peaking specifically between ages 21–23 and 30–34 ($P < 0.001$).
- The relationship between income and binge drinking is not moderated by military parent status, as shown by the parallel trends in the predictive margins graph.
- Sex is a significant predictor ($P = 0.002$), with one females drinking significantly less, while income and military status alone are not significant.



Discussion

- These findings show military offspring had significantly fewer binge drinking episodes (0.55) than civilian offspring (0.85).
- The findings for 16-17 were strong but insignificant, and generally the regression shows that adolescence is not significantly related to bingeing holding other variables constant
- Civilian research often shows a positive correlation between higher income and drinking, this study showed no significant difference ($p = 0.304$) between those earning above or below \$75k
- Ultimately, the prediction that lower-income military families would report higher binge drinking due to environmental stressors was not supported by the mean frequency data.
- Although average drinking was similar across income levels, Bartlett's test ($p < 0.001$) indicates income doesn't change the how many people binge, but how unpredictable/varied the bingeing is between groups
- Future studies could examine deployment number of parents, or examine pay levels of often deployed ranks alongside bingeing frequency to determine if these findings are due to a lack of specificity

References

Ames, G., & Cunradi, C. (2004). Alcohol Use and Preventing Alcohol-Related Problems Among Young Adults in the Military. *Alcohol Research & Health*, 28(4), 252-257.

Acion, L., Ramirez, M. R., Jorge, R. E., & Arndt, S. (2013). Increased risk of alcohol and drug use among children from deployed military families. *Addiction*, 108(8), 1418-1425. <https://doi.org/10.1111/add.12161>

Barry, A. E., Stiefelton, M. L., Hanik, B., Tennant, B. L., Whiteson, S. D., Varnes, J., & Wadsworth, S. M. (2013). Examining the Association Between Binge Drinking and Propensity to Join the Military. *Military Medicine*, 178(1), 37-42. <https://doi.org/10.7202/milmed-12-00293>

Centers for Disease Control and Prevention. (2024, August 6). Facts About U.S. Deaths from Excessive Alcohol Use. <https://www.cdc.gov/alcohol/facts-stats/index.html>

Center for Disease Control [CDC]. (January 2011). Vital Signs: Binge Drinking Prevalence, Frequency, and Intensity Among Adults — United States, 2010. <https://research.ebsco.com/ghw/viewer/pdfonly/23767z>

Casswell, S., Pledger, M., & Hooper, R. (2003). Socioeconomic status and drinking patterns in young adults. *Addiction*, 98(5), 601-610. <https://doi.org/10.1046/j.1360-0443.2003.00331.x>

Collins S. E. (2016). Associations Between Socioeconomic Factors and Alcohol Outcomes. *Alcohol research : current reviews*, 38(1), 83-94. <https://doi.org/10.35946/arcv.38.1.11>

Defense Finance and Accounting Service. (2026, January 12). *Basic pay - enlisted*. <https://www.dfas.mil/MilitaryMembers/payentitlements/Pay-Tables/Basic-Pay/EM>

Edenberg, H. J., & Foroud, T. (2013). Genetics and alcoholism. *Nature Reviews Gastroenterology & Hepatology*, 10(8), 487-494. <https://doi.org/10.1038/ngastro.2013.86>

ENOC. (2006). Genetic and Environmental Influences on the Development of Alcoholism. *Annals of the New York Academy of Sciences*, 1094(1), 193-201. <https://doi.org/10.1196/annals.1376.019>

Gilreath, T. D., Cederbaum, J. A., Astor, R. A., Benbenishty, R., Pineda, D., & Atuel, H. (2013). Substance Use Among Military-Connected Youth: The California Healthy Kids Survey. *American Journal of Preventive Medicine*, 44(2), 150-153. <https://doi.org/10.1016/j.amepre.2012.09.059>

Kuhn, M., Schutarski, M., & Steins, U. I. (2020). Income and Health Inequality in America, 1949-2016. *Journal of Political Economy*, 128(9), 3469-3519. <https://doi.org/10.1086/708815>

National Institute on Alcohol Abuse and Alcoholism. (November, 2024). Alcohol and the Adolescent Brain. <https://www.niaaa.nih.gov/publications/alcohol-and-adolescent-brain>

Osborne, A. K., Wilson-Menzfeld, G., McGill, G., & Kiernan, M. D. (2022). Alcohol and alcohol use: a systematic narrative review. *Occupational Medicine*, 72(5), 313-323. <https://doi.org/10.1093/occmed/kqac045>

Trone, D. W., Powell, T. M., Bauer, L. M., Seelig, A. D., Peterson, A. V., Littman, A. J., Williams, E. C., Maynard, C. C., Bricker, J. B., & Boyko, E. J. (2018). Smoking and drinking behaviors of military spouses: Findings from the Millennium Cohort Family Study.