Education Analysis of the United States*

Exploring the Generational Difference in Highest Obtained Education Level in 2021

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17 March 2023

This paper discusses the generational difference in the highest obtained education level in the United States, by comparing respondents to their mothers and fathers. We find that the majority of respondents have more than 4 years of college as their highest education level, while both their mothers and fathers have high school as their highest education level, as reported in 2021. These findings matter as we can further explore the generational difference in the required education level to work.

1 Introduction

Education is widely recognized to be the foundation of one's success, playing a crucial role in opening new opportunities and shaping our society (Al-Shuaibi 2014). When looking at students in particular, education holds many benefits. Through illuminating one's mind and ways of thinking, education provides a pathway for students to plan for employment or pursue higher education, it grants one to have a good status within society, and self-confidence, contributing to an arguably, more "successful" life.

The structure of education in the US follows a similar pattern to that of many systems. If one were to follow the "standard" path of US education systems, they would go into early childhood education, followed by elementary school, middle school, high school, and then a post-secondary education. Postsecondary education commonly includes a bachelor's (or college) degree, a master's degree, an advanced intermediate, and a research doctorate. Despite this, it is important to note that the level of education needed for employment differs depending on the field, skills, and expertise required.

Children's educational outcomes have been found to be strongly correlated with the level of education their parents have obtained. This is often due to influences from the family

*Code and data are available at: https://github.com/tayedzac/GSS_education.

environment and the resources available to the child as they are raised (Ludeke et al. 2021). For example, if a child's parents have gone to college or a graduate school, the child is more likely to model their parents' achievement-oriented behaviors, and have access to achievement-oriented opportunities (University 2021). They are therefore likely to have a positive view on pursuing higher education and landing a "successful" career. In contrast, parents who did not get a degree, but rather immediately entered the workforce, are more likely to devalue a college education, influencing the child's pursuit of higher learning and path of career.

Most studies conducted around this field of research, however, heavily focus on the correlation between the child's educational outcomes or educational success and the level of education their parents have obtained. In addition, many studies will also focus on the child's education and the families' income level. Thus, this paper aims to look beyond educational outcomes and economic factors and explore the highest education level obtained by one in comparison to their mothers and fathers. We particularly consider the potential of a generational difference, and look at the relationship between the child and their mothers' and fathers' highest education level separately, instead of grouping parents as a whole. Through this, we not only get a sense of the way the required level of education for getting a career in our society is changing through generations but also see the gender inequalities that exist in education settings when looking at mothers' and fathers' highest education levels individually.

The remainder of our paper holds four sections. In section 2, we explain the data source and methodology used for data collection, potential bias and ethics issues, and the variables we use. In Section 3, we present our results and the findings. Finally, in Section 4, we discuss what the results we found mean, weaknesses and limitations in our paper, and the next steps we can take to enhance the findings of this report.

We use R (R Core Team 2022) for all data cleaning and analysis, R packages *tidyverse* (Wickham et al. 2019), *janitor* (Firke 2023), *tidyr* (Wickham, Vaughan, and Girlich 2023), *dplyr* (Wickham et al. 2023), *ggplot* (Wickham 2016), to create the figures, and *haven* (Wickham, Miller, and Smith 2022) to read the dta files.

2 Data

2.1 Data Source and Methodology

The data used in this paper is obtained from the General Social Survey (GSS), which has been providing a nationally representative survey of adults in the United States since 1972. In this paper, we specifically looked at data collected in 2021, which was provided by the 2021 General Social Survey Cross-section Codebook. Respondents invited to participate were adults aged 18 or older in the United States, living in non-institutional housing at the time of the interview. Due to concerns with COVID-19 and in-person contact, the 2021 GSS Cross-section survey redesigned the method of outreach and data collection. Instead of the Kish grid method used in previous rounds of the GSS, which required in-person contact, respondents were selected

by the last birthday method and both survey invitations and data collection were completed through an online web link or through the phone. The final sample size was 4032 completes from 27591 lines of sample, with a response rate of 17.4%. 88.3% of respondents completed the 2021 GSS Cross-section via a web survey, while 11.7% of respondents completed it through a phone interview.

2.1.1 Strengths and Weaknesses of GSS

A strength of the GSS is that they provide the respondents with multiple options when selecting an answer. For example, when selecting what level of education one has completed, they have the option to select from 20 different choices ranging from having no formal schooling to having 8 years of college experience. This reduces the degree of uncertainty respondents may experience and allows us to get more accurate information from the respondents.

2.1.2 Potential Ethical and Bias Issues

The method of outreach and data collection either by web or over the phone introduces potential ethical and bias concerns. First, there is potential for a non-sample error where participants do not give accurate responses. With online surveys, there is no way to guarantee that respondents understand the survey questions correctly.

Additionally, there is a potential for sampling errors, where the sample group is not representative of the population. As this survey aims to generalize the entire population of the United States, conducting an online survey or phone call assumes that everyone has an internet connection or phone that is easily accessible to them, eliminating the group of those who do not. In addition, all respondents lived in non-institutional housing at the time of data collection, making it difficult to generalize the results as the lifestyle and services provided to residents of non-institutional and institutional housing differ.

Ethically, family-related questions must be approached cautiously in the survey. The survey fails to consider the potential respondents who have different familial relationships or circumstances in relation to education-related questions, including but not limited to: single-parent households, having no contact with one or more parents, being a foster child, and whether or not their parents are adoptive/step-parents. Although the survey provides respondents the option to state “Don’t Know” or “No Answer”, it can be demotivating for respondents to have to skip through numerous questions that they do not feel comfortable answering or applicable to.

2.1.3 Attributes

In this analysis, we used an individual year dataset which summarizes variables specific to the year 2021. Through data cleaning, we chose to keep the following variables: EDUC (Respondent's education), PAEDUC (Father's education), and MAEDUC (Mother's education). While all of these variables are within one data set, the Quick Guide to Variables in the 2021 GSS Cross-section document classifies and organizes these variables: EDUC goes under 'Demographic, Household Characteristics, Paradata, and Process Data', and PAEDUC and MAEDUC go under 'Parental/Social Origin Data'.

2.2 Exploration

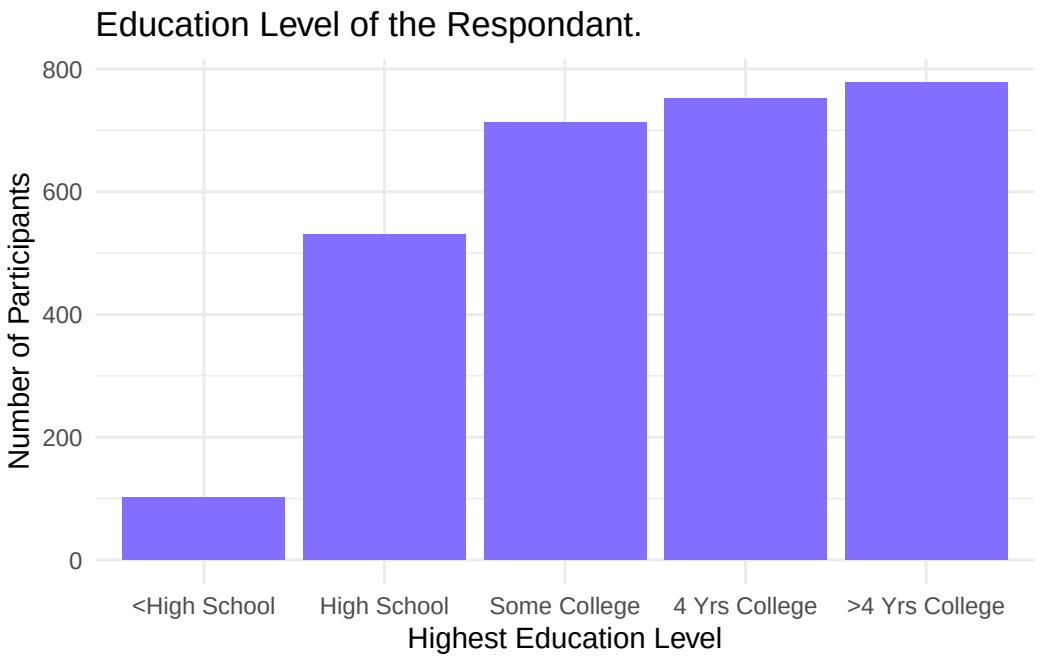

Figure 1: Highest Degree of Education Obtained by the Respondant.

Figure 1 shows the highest degree of education completed by the survey respondents by 2021. We can see that the largest number of respondents, close to 800 respondents, have obtained more than 4 years of college as their highest level of education. In addition, it can be seen that over 700 respondents have obtained some level of a college education and approximately 750 respondents have completed 4 years of college, which is the traditional number of years to complete a college degree in the United States. Referring to the first two levels of education, we see a large gap between the number of those who have completed high school (over 500 respondents) and those who have not (approximately 100 respondents).

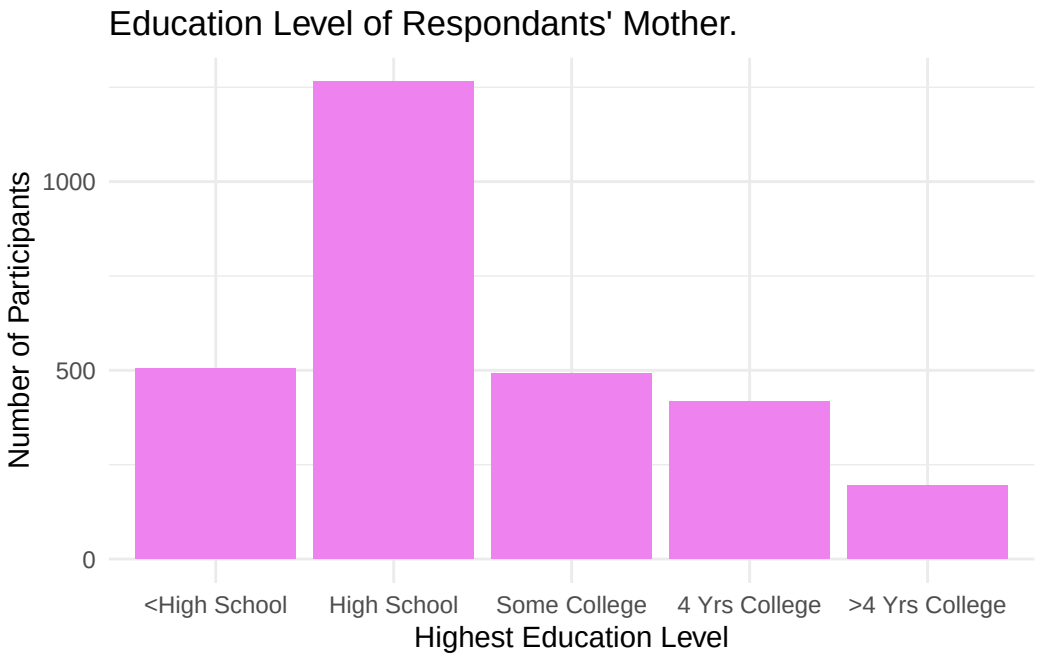

Figure 2: Highest Degree of Education Obtained by the Respondants' Mother.

Figure 2 shows the highest degree of education completed by respondents' mothers, by 2021. We see that the majority of respondents' mothers earned a high school degree as their highest degree of education. We also see that the number of mothers who obtain an education level beyond a high school degree becomes progressively lower as just under 500 mothers have some college education and less than 250 mothers with more than 4 years of college.

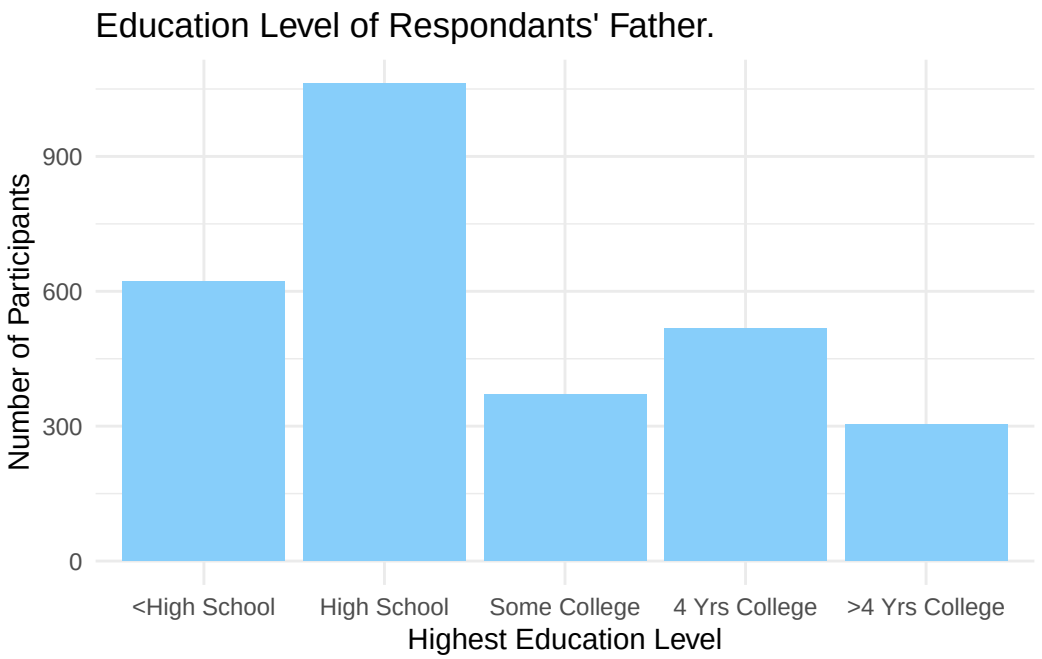

Figure 3: Highest Degree of Education Obtained by the Respondants' Father.

Figure 3 shows the highest degree of education completed by respondents' fathers, by 2021. The graph shows that the largest number of respondents' fathers have completed high school as their highest degree of education. It is interesting to note that the number of fathers who have less than a high school education (over 600 fathers) is higher than the number of fathers with an education level beyond high school. When looking at education levels beyond high school, we see that more fathers have completed 4 years of their college education, thus have likely obtained a college degree according to the traditional number of college years in the United States.

3 Results

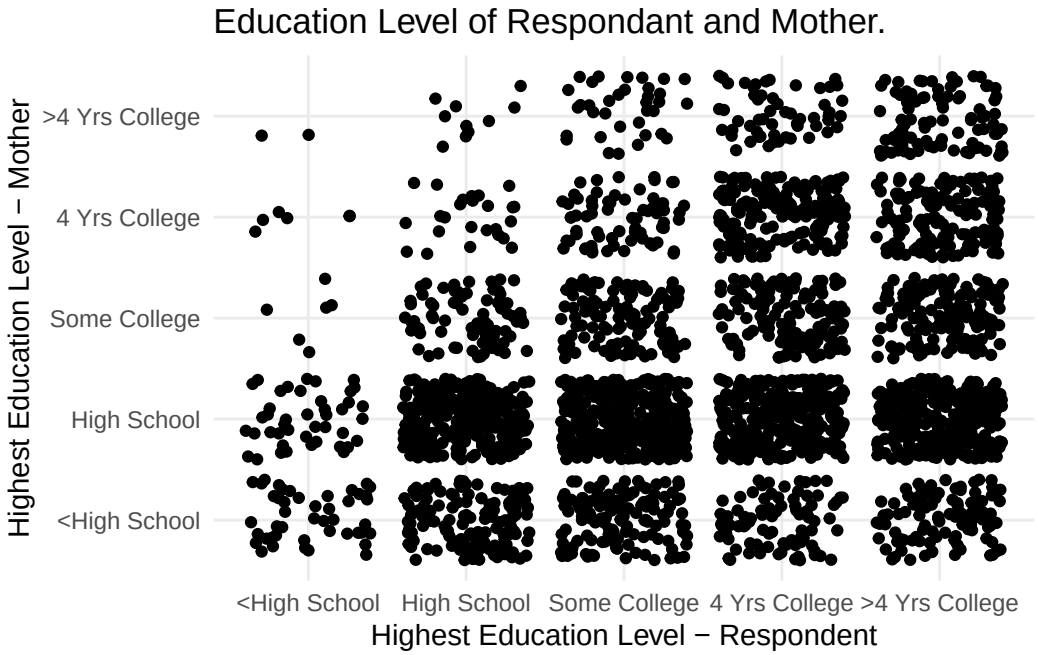

Figure 4: Comparison Between the Respondant and Mother.

Figure 4 explores two discrete variables: the highest education level of respondents and the highest education level of respondents' mothers, by 2021. For all levels in the respondents' education level category, there is a general pattern where the most populous levels are when the mothers' obtained a high school education as their highest level. This makes sense as Figure 2 shows that the majority of mothers have high school as their highest obtained education level and Figure 1 shows that most of the respondents obtained a high school education or beyond. Another interestingly populated area is where both the respondent and mother have 4 years of college as their highest education level.

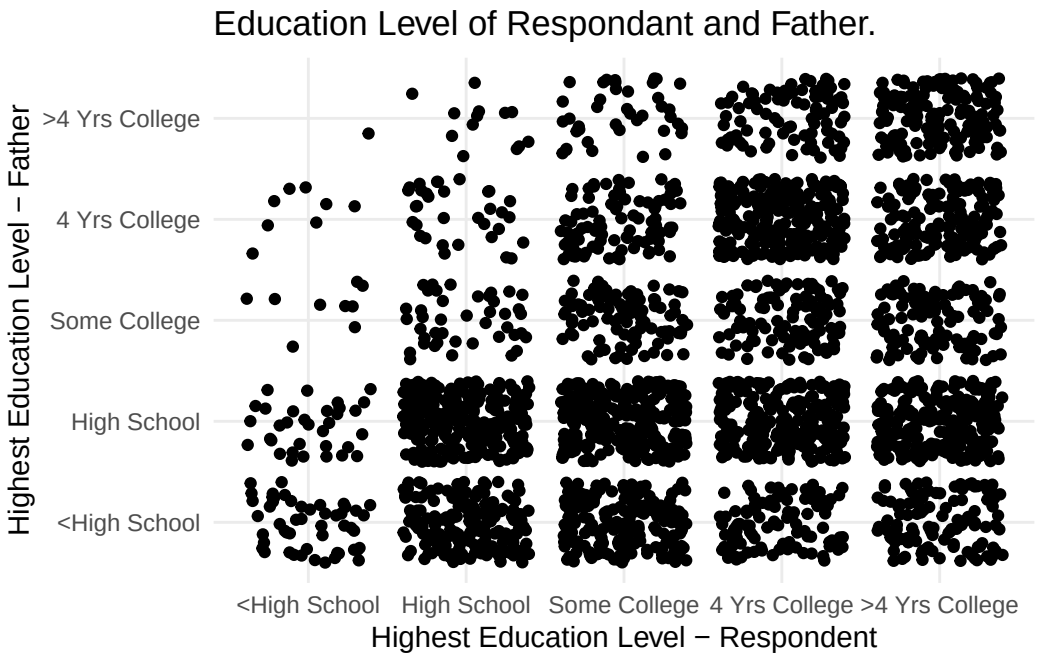

Figure 5: Comparison Between the Respondant and Father.

Figure 5 explores two discrete variables: the highest education level of respondents and the highest education level of respondents' fathers, by 2021. We see that the most populated areas are where respondents have their highest education level as high school and beyond, whilst their fathers have high school as their highest education level. This makes sense as the majority of fathers have high school as their highest education level in Figure 3 and Figure 1 shows that most of the respondents obtained a high school education or beyond. Similarly to Figure 4, we see another populated area where both the respondent and father have 4 years of college as their highest education level.

4 Discussion

4.1 Generational Difference with Highest Obtained Education Level

Based on patterns shown in the figures above, we find that the greatest number of respondents have more than 4 years of college as their highest education level, while the majority of both mothers and fathers have high school as their highest education level. This may suggest the existence of a generational difference between respondents and their mothers and fathers. Some factors that may contribute to this generational difference include: employees with college degrees in today's society are more likely to have a significant earning advantage in comparison to

those who don't (Rose (n.d.)). Additionally, the requirement of having a master's-level degree is becoming more common in current entry-level occupations (Torpey (2018)). Furthermore, more Millennials have a bachelor's degree or higher compared with a much lower number of Baby Boomers and Gen Xers when they were the same age (Fry (2019)). Considering these factors, the difference in the number of respondents versus the number of mothers and fathers who have some college or beyond as their highest education level makes sense.

4.2 Highest Level of Education of Mothers Versus Fathers

By comparing the results of Figure 2 and Figure 3, presenting the highest education level of respondents' mothers versus fathers respectively, we see that they both have high school as the highest education level obtained by the majority. However, there are some important differences. We see that a larger number of mothers have high school as their highest level of education in comparison to fathers. In addition, more mothers have some college as their highest education level in comparison to fathers, while more fathers have college as their highest education level in comparison to mothers. Furthermore, we see that a larger number of fathers have more than 4 years of college as their highest level of education in comparison to mothers. These patterns make sense as despite more females graduating high school in 1960, more men were accepted into college in comparison to women (B 2022). Thus, these differences between respondents' mothers and fathers suggest the inequalities and barriers that existed and remain in education settings against girls. Going forward, it may be interesting to investigate the respondents and the varying highest level of education obtained by those of different gender identities, and this is stated in the Weaknesses and Next Steps section.

5 Conclusion

In this paper, we looked at the highest education level obtained by respondents, their mothers, and their fathers, by 2021. It was found that the majority of respondents have more than 4 years of college as their highest education level, while both mothers and fathers of respondents have high school as their highest education level. These findings provide significant insight into the generational changes in the highest education level required for occupations in today's society in comparison to that of respondents' mothers and fathers.

5.1 Weaknesses and Next Steps

Our data does not show whether more than 4 years of college is an extension of one's college degree or if they have obtained an advanced degree such as a master's or a PhD. Career path is another factor we didn't consider however, it plays a crucial role in one's highest level of education as different roles have different requirements. Furthermore, our paper fails to explore respondents who answered "N/A" in any of their responses. As a result, this

potentially eliminates responses from those who have extenuating circumstances including but not limited to: coming from single-parent households, having no contact with one or more parents, being a foster child, and whether or not their parents are adoptive/step-parents.

In future explorations, it would be interesting to explore the relationship between one's gender identity and their highest obtained level of education as we found existing gender inequalities in education level between mothers and fathers. Lastly, it would be interesting to explore the degree to which the make of one's device plays a role in their highest obtained level of education, as explored in our supplemental survey in the appendix.

6 Appendix

Here is the link to our supplemental survey: https://forms.gle/Fy1oH52yvMPbn9P19

References

Al-Shuaibi, Abdulghani. 2014. *The Importance of Education*. https://www.researchgate.net/publication/260075970_The_Importance_of_Education.

B, Mister. 2022. *Boomers Went to College More Often Than Their Parents*. https://misterboomer.com/2022/05/boomers-went-to-college-more-often-than-their-parents/.

Firke, Sam. 2023. *Janitor: Simple Tools for Examining and Cleaning Dirty Data*.

Fry, Richard. 2019. *How Young Adulthood Today Compares with Prior Generations*. https://www.pewresearch.org/social-trends/2019/02/14/millennial-life-how-young-adulthood-today-compares-with-prior-generations-2/.

Ludeke, Steven G, Miriam Gensowski, Sarah Y Junge, Robert M Kirkpatrick, Oliver P John, and Simon Calmar Andersen. 2021. *Does Parental Education Influence Child Educational Outcomes? A Developmental Analysis in a Full-Population Sample and Adoptee Design*. https://pubmed.ncbi.nlm.nih.gov/32538645/.

R Core Team. 2022. *R: A Language and Environment for Statistical Computing*. Vienna, Austria: R Foundation for Statistical Computing. https://www.R-project.org/.

Rose, Stephen. n.d. *The Value of a College Degree*. https://cew.georgetown.edu/wp-content/uploads/2013/11/TVOACD.SR_.pdf.

Torpey, Elka. 2018. *Employment Outlook for Graduate-Level Occupations*. https://www.bls.gov/careeroutlook/2018/article/graduate-degree-outlook.htm.

University, Lamar. 2021. *Correlation Between Parents' Education Level and Children's Success*. https://degree.lamar.edu/online-programs/undergraduate/bachelor-science/university-studies/parents-education-level-and-childrens-success/#:~:text=But%20parents%20influence%20their%20children,high%20value%20on%20educational%20attainment.

Wickham, Hadley. 2016. *Ggplot2: Elegant Graphics for Data Analysis*. Springer-Verlag New York. https://ggplot2.tidyverse.org.

Wickham, Hadley, Mara Averick, Jennifer Bryan, Winston Chang, Lucy D'Agostino McGowan, Romain François, Garrett Grolemund, et al. 2019. "Welcome to the tidyverse." *Journal of Open Source Software* 4 (43): 1686. https://doi.org/10.21105/joss.01686.

Wickham, Hadley, Romain François, Lionel Henry, Kirill Müller, and Davis Vaughan. 2023. *Dplyr: A Grammar of Data Manipulation*.

Wickham, Hadley, Evan Miller, and Danny Smith. 2022. *Haven: Import and Export 'SPSS', 'Stata' and 'SAS' Files*.

Wickham, Hadley, Davis Vaughan, and Maximilian Girlich. 2023. *Tidyr: Tidy Messy Data*.