Work Stress*

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Abstract

This paper discusses data from some survey, which can gather data that is linked to how people face work stress. This paper uses the original data from the survey which determines the relationships between respondent work stress levels by satisfaction, status, sectors, and work time. This paper will provide a strong analysis about the work stress that people are facing.

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*Code, data are available at: https://github.com/YoungKim164/workstress and https://doi.org/10.1257/jep.36.1.151 and replication package at: https://doi.org/10.48152/ssrp-cdf6-2r92

1 Introduction

Work is the most common cause of many people to get stress. Work stress can be found in many forms for people. In this paper, we will examine job status, work hours, industry sector, satisfaction rate of your job into the correlation of work stress levels. There are many analysis to talk about relevant to work stress.

In this paper, we gathered data from (Publisher Name), (Data Name). With the gathered data, we generated figures to observe the trend in work stress of different categories using R (R Core Team 2020). We also uploaded and cleaned data using R (R Core Team 2020), tidyr (Wickham 2021), dplyr (Wickham et al. 2021), tidyverse (Wickham et al. 2019), and haven (Wickham and Miller 2021) packages. Figures and tables were created with knitr (Xie 2014), ggplot2 (Wickham 2016), kableExtra (Zhu 2021), and dplyr (Wickham et al. 2021).

In section 2 we discuss the source of the data used in this paper, the strengths and weaknesses the source and methodology contains, and potential blind spots that the data misses. Section 3 discusses the results that is being produced from the figure and what it tells us by its visualization. Section 4, we would provide a brief discussion about what we get from all figures, and make some thoughts. In section 5 there is an optional survey used to gather more information about stress caused by job status, work hours, industry sector, satisfaction rate of your job into the correlation of work stress levels.

2 Data

2.1 Data Source and Collection

The datasets for this paper were obtained from the paper "The Puzzle of Falling US Birth Rates since the Great Recession" (Kearney, Levine, and Pardue 2022), a paper from the Journal of Economic Perspectives (AEA 2022). The data used by the paper was compiled from various sources such as the NCHS Natality Database (NCHS 2018), CDC SEER (CDCSEER 2019), the Current Population Survey Annual Social and Economic Supplement (CPS ASEC) (Flood et al. 2020), the New York Federal Reserve (Federal Reserve 2022), and the Integrated Public Use Microdata Series (IPUMS) (Flood et al. 2020). The paper and datasets were published in the year 2022. These various sources provide a lot of useful information, shown throughout all of the figures we created in this paper. For example, the sources collected lots of raw data such as the population of people giving birth, race, lifestyle factors, age of parent when giving birth, etc. So, all of this information was collected from these various sources and written into the paper "The Puzzle of Falling US Birth Rates since the Great Recession" (Kearney, Levine, and Pardue 2022). Which was then analyzed in our paper with our version of the analysis.

2.2 Data Cleaning

Most of the data used in this paper were cleaned to get the most accurate information and remove any unnecessary information to be outputted in this paper. Data were cleaned to remove data of some years, age groups, race categories, etc. So that the revised figures can provide the most accurate information according to our analysis and not have any information that is unrelevant to our analysis. From our dataset, we dropped any values that are not related to the specific category, for example, values like NA. We have tried to filter our data much as we can for all of the graphs to make sure that it can make sense.

2.3 Data Modification

We have included mainly all datasets and variables that are very important for our research question. We included variables by race, birth rates, age group, and other important factors. Lots of other variables were included, such as the total number of births and birth rates. Both of these allow us to analyze the decline of births over time. We did lots of modifications of the variables for this paper, which were mainly done within the age category. Generally, the original paper has an age category as one thing from age 15-44. For our figures, we made several figures and chose a specific age range. We have tried our best to divide the range into categories like 15-19, 20-24, 25-34, and 35-44 throughout most of the figures. We have also modified for

race by having a figure that shows the data by different races, such as Black, White, and Hispanic people. Several figures had an important modifications to be relevant to our analysis throughout the paper.

2.4 Data Visualization

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Warning: The dot-dot notation (`..prop..`) was deprecated in ggplot2 3.4.0.
i Please use `after_stat(prop)` instead.
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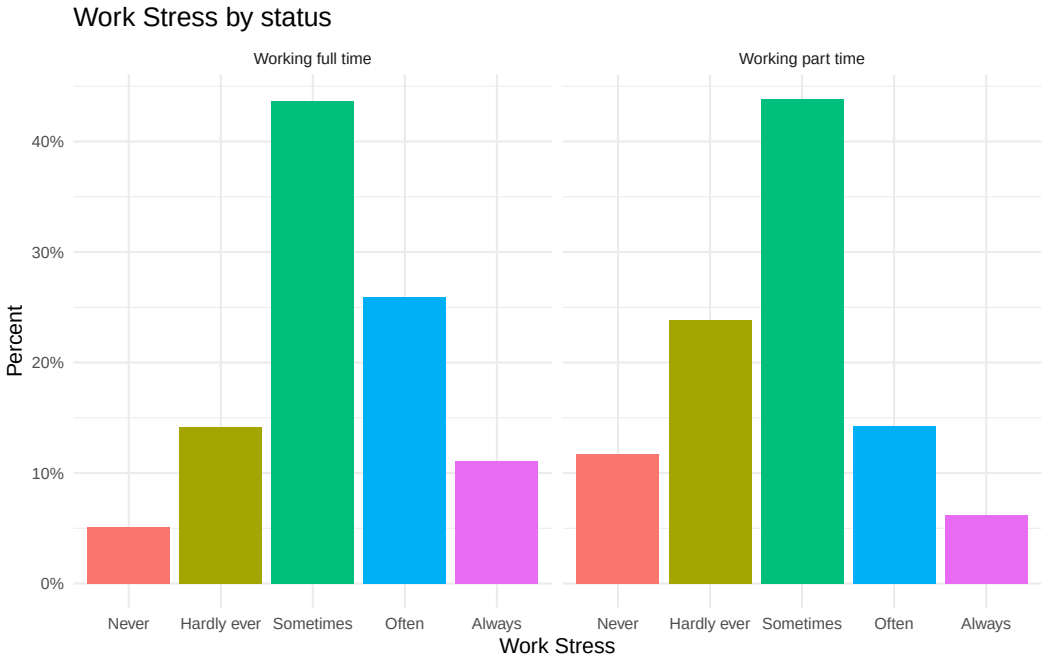

Figure 1: Work Stress by Job Status

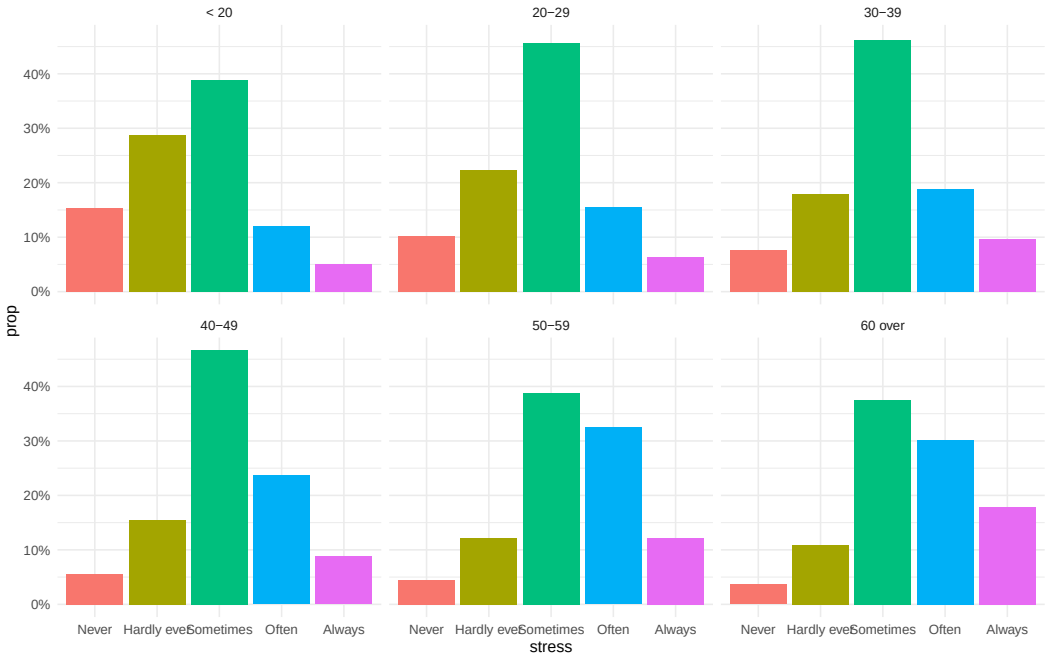

Figure 2: Work Stress by Work Hours

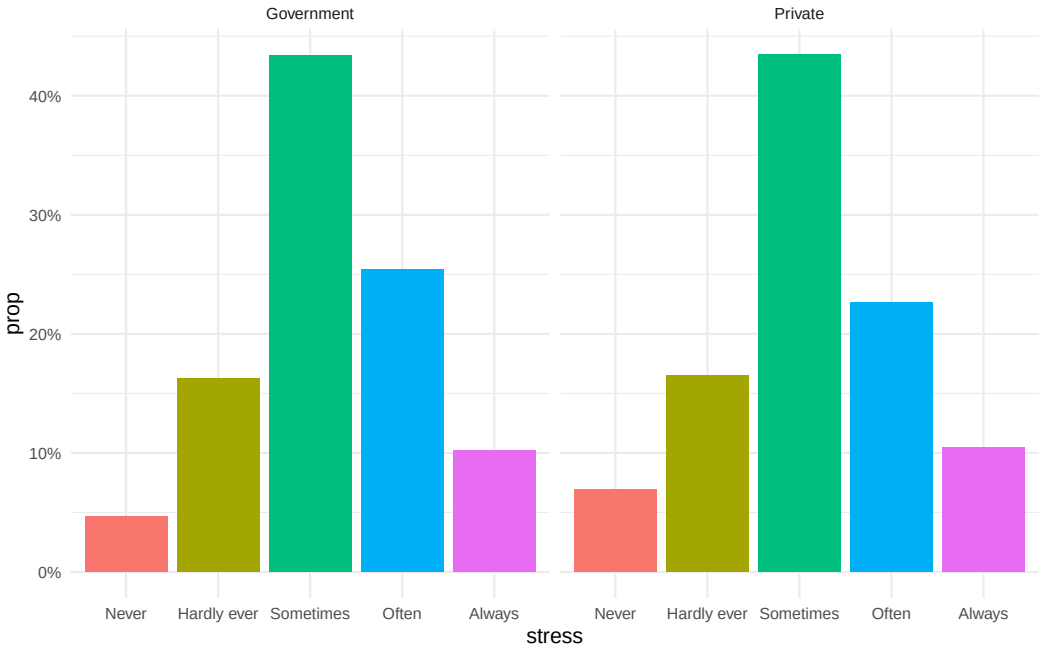

Figure 3: Work Stress by Industry Sector

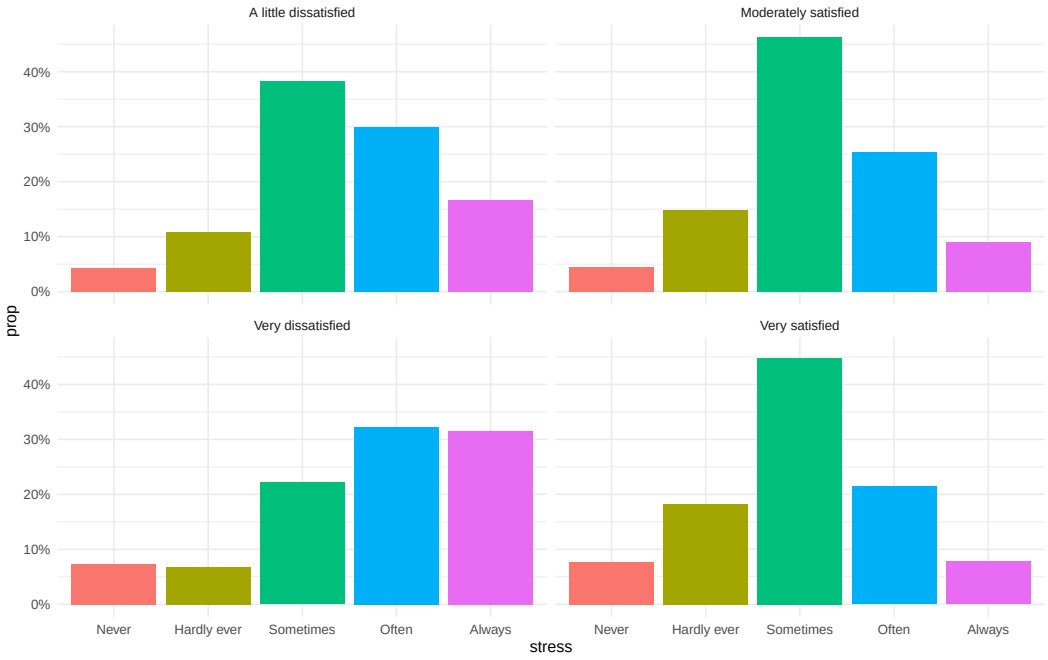

Figure 4: Work Stress by Job Satisfaction

3 Results

Figure 1 shows that over time, the number of births in the United States is dropping steadily, while it slightly went up on peak around 1990, 2001, and 2007. Most likely, the hikes going up during these years might have been into other factors that made more people among the selected population have kids. After 2007, the number of births drastically dropped a lot. Nowadays, among 1,000 women from age 15 to 44, only about 56 births will occur. While in the past, around the 1980s and 1990s, the number of births was around the 65 to 70 range. The line in the graph shows that in the near future, there will be a much lower amount of people having kids, and this can be due to other factors from their lifestyle, which is making them decide not to have more kids.

While the figure shows the birth rate trend is going down, there are certain spikes in the peak of birth rates around 1990, 2001, and 2007. There were some incidents that must have happened in the United States in those years, which may have caused people to stay home more often. As we know that people that are likely to be unemployed tend to have more kids as they will have more freedom during their time spent at home. This allows the birth rates to be higher than usual. During these years, Americans faced lower employment opportunities within society (Agency 2008). They do not have access to useful resources that improve their lifestyle in these years, so they are at home most of the time, which encourages couples to have an interest in having more kids, which ends up increasing the birth rates for these years.

Figure 2 shows the trend in birth rates over the period 2000-2019 in different races for two different age groups. In all race group, the birth rates starts to drop significantly after the Great Recession. In a age group of 15-19, all three race groups had similar drops on the birth rate. On the other hand in age group 20-24 the white race group showed significanat birth rate drop from 86 to 49 birth per 1000 population., where as other race groups had much less birthrate drop.

Figure 4 shows an interesting relationship between changes in birthrate and other economic factors over five years period. Each marker represents a state labelled with its two-letter abbreviation.

Annual expenditures on childcare for families with children under 12 who report positive childcare spending rose $2,170 nationwide for the average of 2015–2019, based on data from the Current Population Survey (all dollar values throughout are measured in constant 2019 dollars). But in the cross-state correlations, places where childcare expenditures increased more, did not experience a noticeable drop in birth rates. In fact, the trend shows that more increases in childcare expenditure have no significant impact on birthrate changes.

Over this period, average monthly rents for a two- to three-bedroom apartment rose $124 per month (from $930 to $1,060 in 2018 dollars, a 14 percent increase) nationwide. The increase was much larger in some states, like Colorado, Washington, and the District of Columbia. The data, however, do not indicate a negative association between rent changes and birth rate changes.

We used the female-to-male median earnings ratio among full-time, year-round workers to examine women's economic opportunities. On average, the median earning ratio rose to 0.04 in the period. 12 states where the wage ratio rose the most over this sample period did not show a greater birth rate decline.

If young adults are saddled with debt, they might not have sufficient disposable income to have a child or more children. We consider the total student debt per capita level in a state, which has increased from $2,500 to $5,400 (in 2018 dollars) on average. The relationship between state-level student debt and the birth rate is generally flat. It indicates that increases in student debt are related to aggregate reductions in birth rates.

?@fig-5 shows lots of important information about when people tend to have kids at certain age over the timeframe from 1990 to 2020. Based on the graph, the data shows that more people have kids after the age of 30 during this present time. In the past, most people tend to have kids before the age of 30. Around 2000 to 2005, the lifestyle started to change, where people tended to either get married or have kids later, which is why the trend of birth rates in age 30 and up has been going higher since the 2000s. While births before the age of 30 tend to slow down and decrease over time from the 2000s. According to the graph, maybe in another 100 years, we can expect that most birth rates can happen around 40-44.

There are drastic changes shown in **?@fig-5**, such as age 30-44 tends to increase around the 2000s, while the ages below 30 decreases for the number of birth rates. Around the decade of the 2000s or the beginning of this new 21st century, there was lots of modernization from people's lifestyle to other things on Earth, which is coming from several factors such as education and employment due to new innovations and inventions (Dimock 2021). There are lots of new behaviour being introduced to a new generation of people. So, as they get new behaviour of attitudes, that is being involved in their decisions of marriages, and when to have kids. This is why lots of people are now getting married late and/or having kids much later when compared to the past.

?@fig-6 shows lots of useful information about the cumulative birth rate by mother's age in several birth cohorts from early 1968 to late 1997. We tend to use these years since, in recent times, we believe that there is enough data for these years since most of the births and living people are among these cohorts. According to **?@fig-6**, the earlier the cohort is, the cumulative birth rate will be really high. While the later the cohort is, the cumulative birth rate will be much lower. The highest cumulative birth rate is coming from the birth cohort of 1968-1972 and 1973-1977. While the lowest comes from the 1993-1997 birth cohort.

?@tbl-1 shows the most contributor to the decline in birth rates across all age groups. The top contributor is Hispanic with less than high school education women between age 20-24 at -88.3, Hispanic with high school education women between age 15-19 at -57.5, and Black (Non-Hispanic) women between age 15-19 at -39.8, respectively.

4 Discussion

4.1 Birth Rates by Demographic Groups

In 1997, NCHS released a report titled "Mother's Educational Level Influences Birth Rate." According to the report, a women's education level is the best predictor of how many children she will have. In the report, NCHS describes a direct relationship between years of education and birth rates, with the highest birth rates among women with the lowest educational attainment ("1997 Fact Sheet - Mothers Education and Birth Rate" 1997).

We are particularly interested in ethnic groups of ages 15-19 and 20-24. Figure 2 shows a sharp decline in birth rates among all groups of women between the age of 15 to 19 during the post-2007 recession. Figure 2 also shows a sharp decline over the same period; however, only among white ethnic women between the ages 20 to 24, while other groups show a relatively steady decline. Figures that are omitted from this paper of the other age groups (25 to 34 and 35 to 44) show a similar trend both in pre and post-recession. However, as shown in **?@tbl-1**, the most significant contributor to the decline in the birth rate is Hispanic, with less than High School education, women between ages 20-24 after 2007. This result contradicts the earlier claim made by NCHS. The finding suggests, in the post-2007 recession, the women's education level and birth rate now correlate positively.

4.2 Economic and Policy Factors

In Figure 4, we show other economic factors that might have negatively affected the birth rate in the post-2007 recession across the states. Although the graphs show their inverse relationship, no dramatic change is shown. For instance, as there were somewhere around $1000 to $2000 increases in childcare expenses over the past 13 years, we see that the decrease in the actual birth rate is only between 0 to -10. Change in per capita student loans also has increased between $2500 to $3250, but it only contributed to the decrease somewhere between 0 to -5 across the states. Based on these findings, it is hard to find an explanation of the dramatic decline in the birth rate since 2007 from economic factors.

4.3 A Potential Explanation: Shifting Priorities

When it comes to the age of the population of the United States and comparing it from the past to now. It shows that more people tend to have kids much later than before. While fewer people have kids earlier than in the past. In the past, more people tend to have kids much earlier. There are several reasons why more people had kids at an early age back then; people used to get married much earlier, and many people were unemployed or doing a job for self-employment, which was not even an educated or professional job. The modern lifestyle that has been adopted in the past few decades tends to make people focus on all other areas of life, which makes them marry much later, and have kids later. Nowadays, many marriages happen at the age of late 20s or early 30s, while they tend to have their first child around the early to mid-30s. **?@fig-5** depicts the birth rates in women between the ages 30-39 and 35-39 positive slope trend. Whether pre or post-2007 recession, this trend looks steady over the past 40 years. This finding aligns with the current common belief and the social norm where, perhaps, women's peak childbearing ages have shifted from the early twenties to early thirties. **?@fig-6** shows the average number of children born to women by age in five-year intervals from the 1968-1972 through 1993-1997 birth cohorts. These birth cohorts include women entering their peak childbearing years (20–24) in 1992, 1997, 2002, 2007, and 2017. This chart indicates that the three cohorts of young adult women born between 1968 and 1982 in 1992, 1997, and 2002 had similar childbearing age profiles. The 2007 birth cohort of women had fewer children in their 20s and 30s. The 2012 and 2017 birth cohorts (born between 1988 and 1997) have significantly fewer children than the preceding cohorts. This finding is consistent with a decline in births, primarily to more recent cohorts of women. From a statistical point of view, this divergence across cohorts explains the sizable decrease in annual birth rates that began in 2007.

4.4 Weakness and Moving Forward

4.4.1 Bias and Ethical Concerns

As we know that this data was collected and created by other human beings, just as how we are. There are some ethical concerns that could affect the accuracy of our data because humans can make mistakes, and they can make decisions based on their preferences, which can affect the whole dataset. So, this analysis is only valid based on our dataset, which can be modified if the original dataset is changed.

The original data shows different races, such as White, Black, and Hispanic. They have included Hispanic based on all colours, which erases the identity of Black and Indigenous Hispanic people. This tends to be a bit of racism because the information provided on the data did not specifically indicate whether or not the Hispanic category includes everyone that identifies as Hispanic or is it just people that look Hispanic.

4.4.2 Data Collection Concerns

This dataset tends to collect huge data information on the population among people from the United States and considers lots of factors from race, birth rates by age, student debts, etc. Having too much information means that when the data is collected, there is a possibility of human error, calculation error, and chances of small modification of data due format of reporting an error. So, the way how the data was collected can have lots of problems because people can make mistakes easily.

4.4.3 Moving Forward

This paper raised concerns about a dramatic decline in U.S. birth rates starting in 2007. Through the paper, we proposed a general explanation for the decline in births across recent cohorts of U.S. women that focuses on the shifting priorities of cohorts. As dictated by the recent socio-phenomena that encompasses preferences for having children, life aspirations, and the nature of parenting, a change in the relationship between education and childbearing, a rise in childlessness, and the establishment of a two-child norm for those having children have irreversibly changed (Kearney, Levine, and Pardue 2022). This new social phenomenon that might be causing the dramatic decline in U.S. birth rates is important from an economic policy standpoint to acknowledge that an aging population and shrinking workforce pose challenges to economic growth and the sustainability of social insurance systems (Yang and Morgan 2003). Thus, the most appropriate way to address declining U.S. birth rates may be required: 1. developing A.I. and robots where a shrinking workforce poses a problem, 2. an appropriate policy to address issues with Social Security and Medicare on a secure basis for the long-term. Suppose the U.S. birth rate is not showing any reverse trend shortly. In that case, the U.S. economy and political system should enforce greater emphasis on addressing the issue before it becomes irreversible.

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