CS573 Process Book

If “Tiger Mother” exists

Chenjie Jiang, Chen Liang
2018.02.28

Table of Contents

Overview & Motivation

There is a common perception that Asian American parents are authoritarians when it comes to schoolwork and extracurricular activities, and exceedingly demanding of their children both academically and at home. Recently, these parents have been termed “tiger parents” (Chua, 2011) for the ferocity with which they discipline their children and for their emphasis on the importance of family obligation and academic achievement.
The current study uses data from American Time Use Survey to explore the time use of students and mothers across ethnic groups.

Goals & Questions

The main goal of our project is to find if there are any features of “tiger mother” in their time using, and if these features affect the time schedule of their children. Base on this, we raised some questions from different aspects.

If Asian students differ from other ethnic groups?

- How much time do students spend for homework?
- How students spent their time was working at job.
- Do Asian student spend more time studying than students of other ethnic?

If there mothers do with this?

- Do Asian mothers spend more time pushing their children to academic success?
- Do Asians coast when they get to college?

Summary question:

- Are Tiger Mothers more efficient in time use?

Project Tasks

- **Data acquisition and processing:** Data were acquired from ATUS, which we will give some details in the following section. The data we get is fairly clean (no abnormal data), thus we used R to extract the subset we need used Python to reorganize the data, store them into different .csv files for the later use of visualization.
- **Visualization and interactivity implementation**: According to the data we extract, we designed some potential visualizations that we may use, the detail of visualization is in the Design Evolution section. We used excel to visualize them for the first attemption, and used d3 to complete the final design.

- **Analysis of graph and compilation of storytelling:** Based on the visualization and some article we read, we give a story about the data we visualized, in order to make it more meaningful.
- **Website design and implementation:** We designed a layout of the website to help user understand the whole process of our project completement and the progress we have made.

Data Processing

Data collections

We analyzed detailed data from the American Time Use Survey. This U.S. government survey measures the time use of thousands of individuals based on time diaries, which are considered the most accurate way to measure time use. We concentrate on student individuals which enrolled in high school or college and mother individuals from 25 to 45 during 2011 to 2016.

Data cleansing

The whole process of the data processing can be separated as two main parts, after cleansing, data can be directly used for visualization without any further computation.

- **Data Filtering:** we used R to rename the variable to a more understandable way, and extract several subset or summary of data that matches our requirement for further visualization
- **Data reorganization:** we used Python to reorganize the data in a proper way, including combining a person's whole day activities and compute the time period in a day. Thus the JavaScript can reach to each person's or ethnic group's record more easily.

Design Evolution

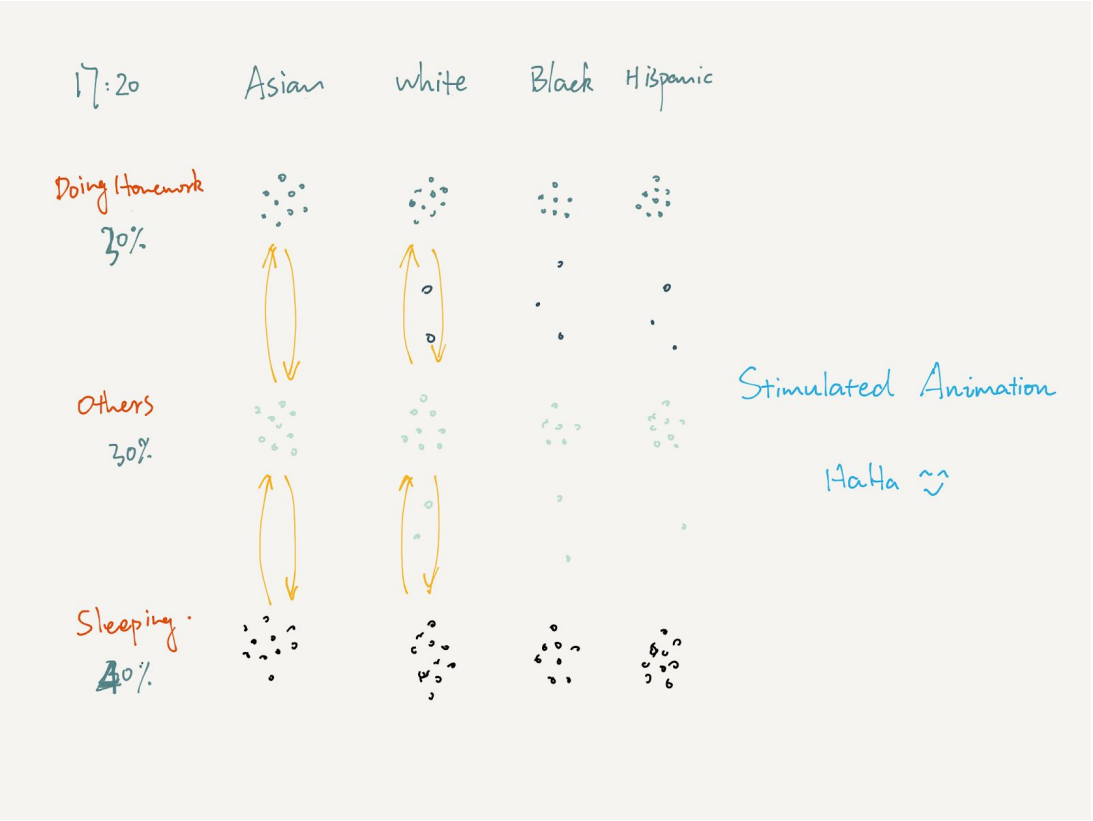
In this section, we are presenting the original and final design, based on the Goals and Questions we want to reach and answer, we will give a description of each of these designs.

Visualization 1 - A life of students

Initial design

The major point we want for this visualization is to give user an intuitive view of the time schedule of students in each ethnic group, we are going to focus on the

study activities and give comparison of each group. Inspired by some visualizations on flowingdata, we came up with our designation.

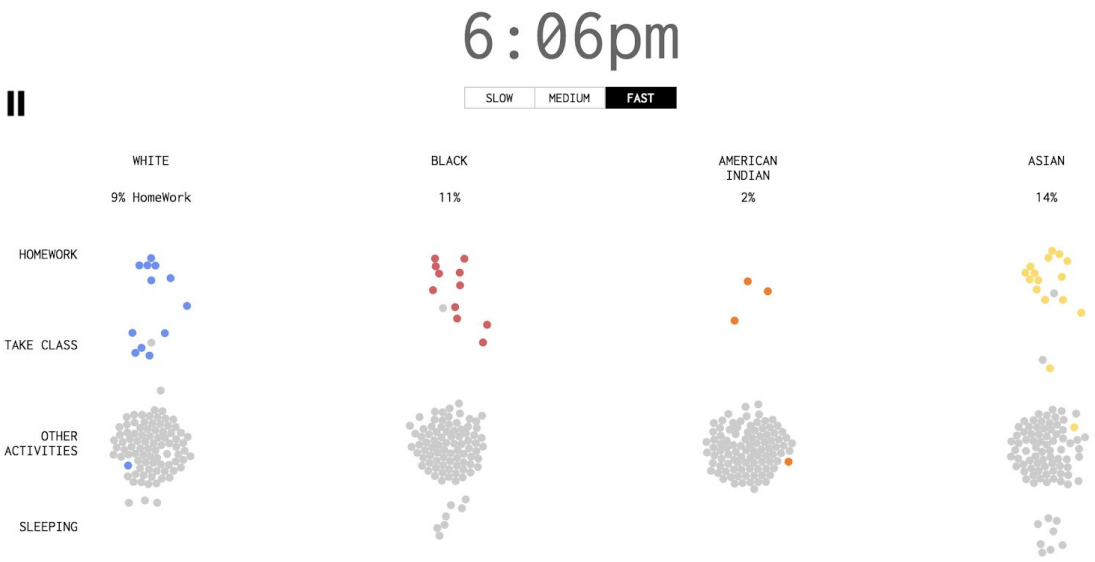


Final design

The majority of the components in the initial design have been preserved in the final design, some minor modifications we made include:

- For the color palette, we used colors in high saturation in other to help user better distinguish the ethnic groups.
- We change a name of an ethnic group to match the original data that we extracted.
- Added the “take class” activity, since taking class can be also obviously considered as a study activity.
- We add the reset and pause button to help users easily see the status of each ethnic group in a exact time.

*This idea and code of the visualization is based on Nathan Yau’s *This is an American Workday, By Occupation*



Detail Description

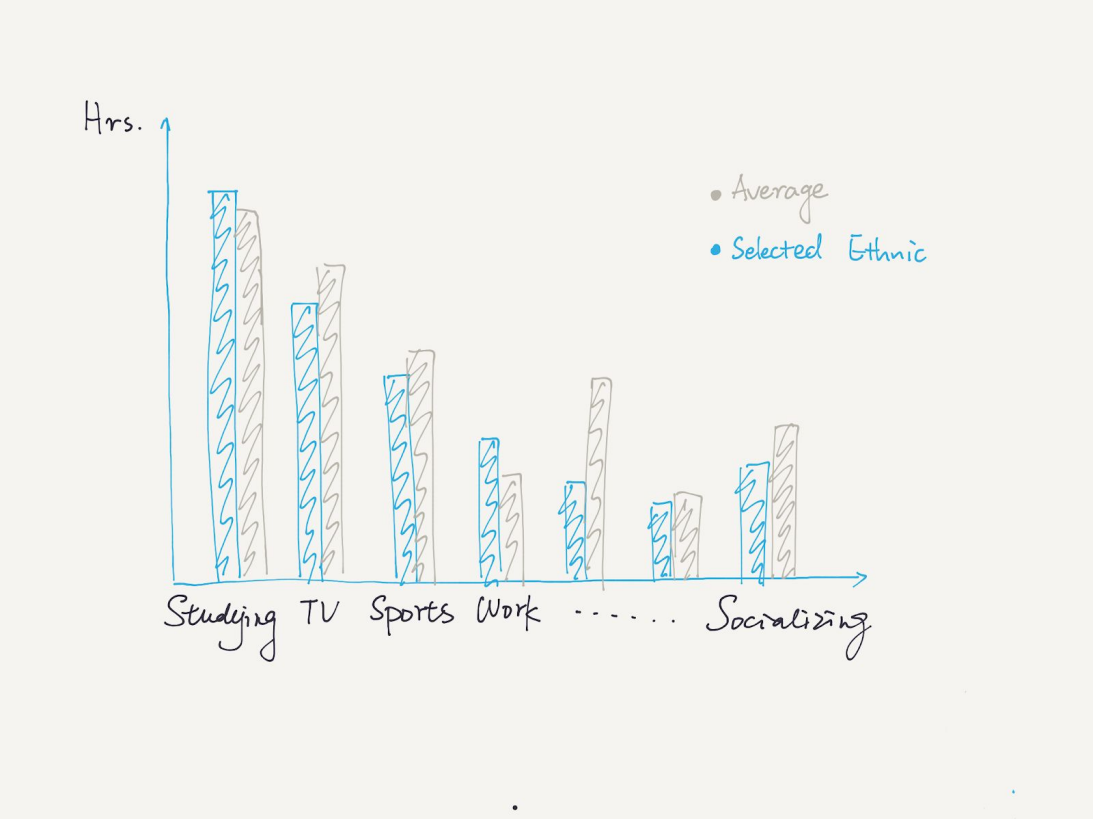
This is a visualization for showing how a student spend their day, by their different races. We randomly picked 100 people's data for each race in our dataset for this stimulation. There are several components in this graph, which is: the time on the top of the graph, three buttons in the middle that used for adjusting the speed of the stimulation, the pause button to stop the stimulation in specific time.

- In this visualization, a dot represents a single person. The y axis of the graph represents the activities that the students are doing. If a student is changing from one activity to another, the dot will move to the cluster that he is currently in. If the student is doing homework or taking a class at this time, the dot will be colored, the color is also representing its race.
- This visualization gave us an intuitive view of the time schedule of a student, Asian students do pay more attention to its homework during the whole day, however, since the number of sample is relatively small, we infer much information from it. We have to go for some statistical indicators.

Visualization 2 - If mother matters?

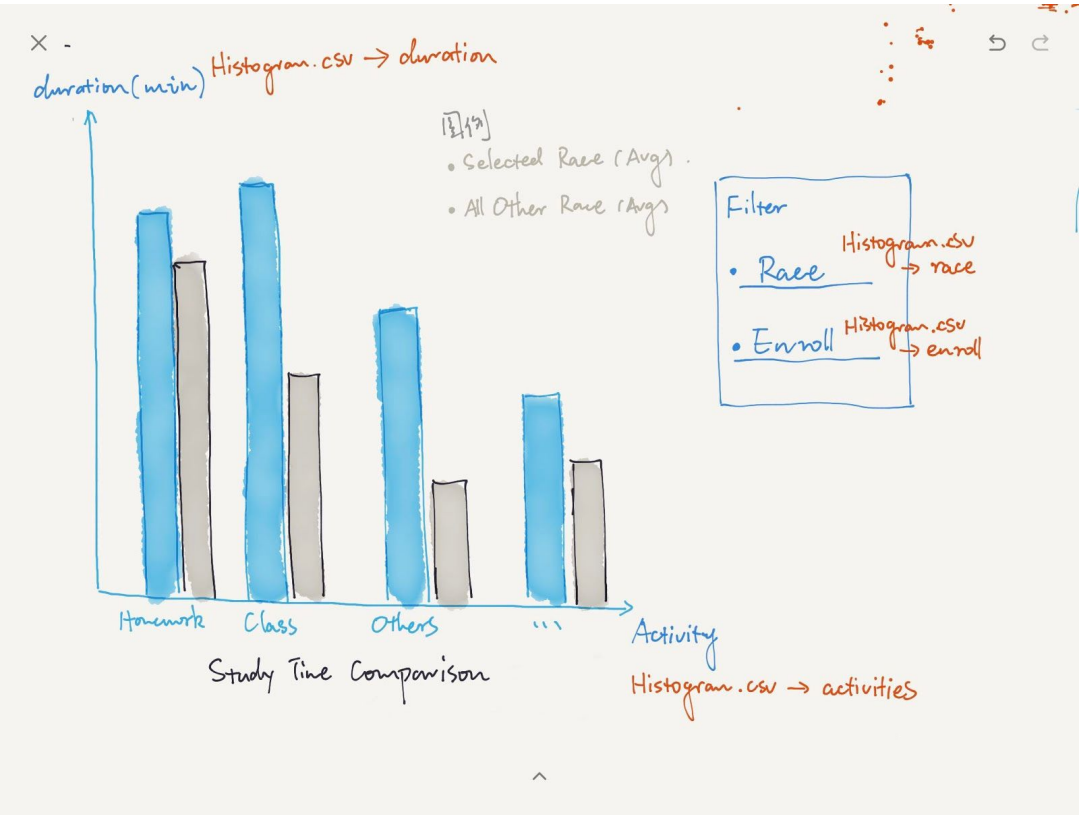
Initial Design

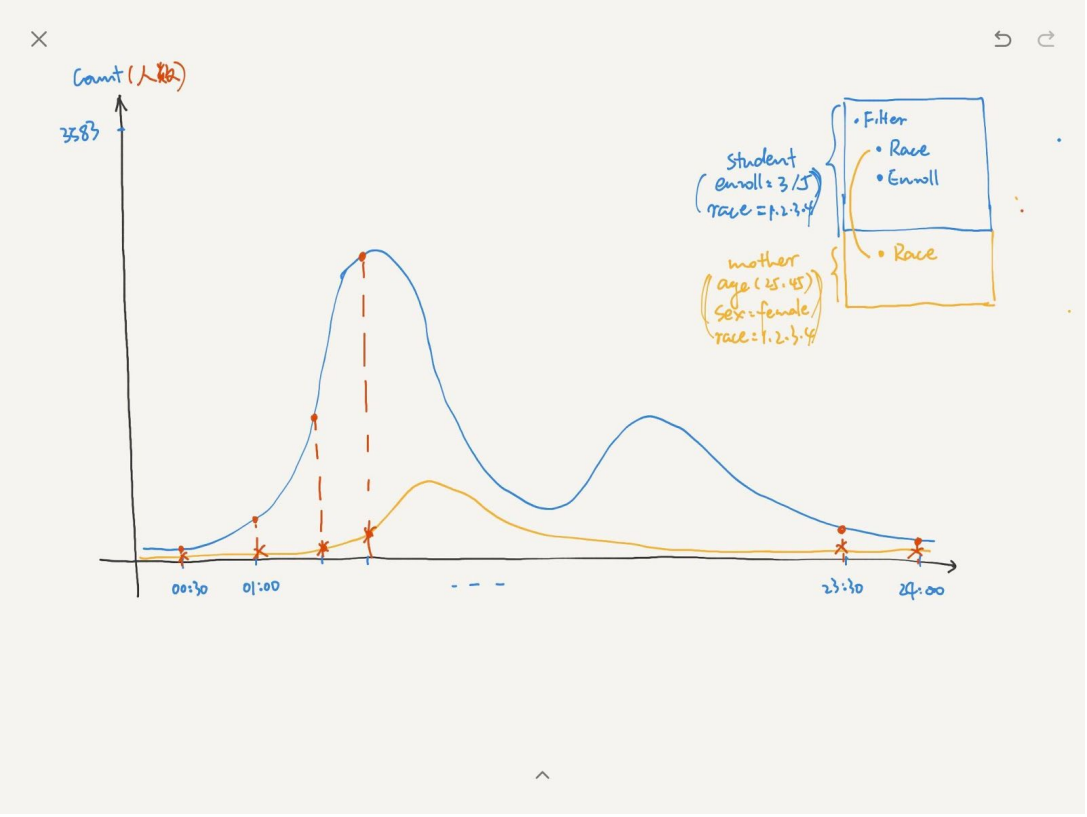
The original thoughts of this visualization was to give a precise comparison of each activities in each ethnic group, and visualize the time distribution of their study activities. Thus we designed a bar chart for comparison.



Adjusted Design

Purely comparison of students can't tell anything about the mother. Thus we tried to compare the mothers' activities along with the children in specific ethnic groups, we added a line chart and a filter in order to visualize these relationships.

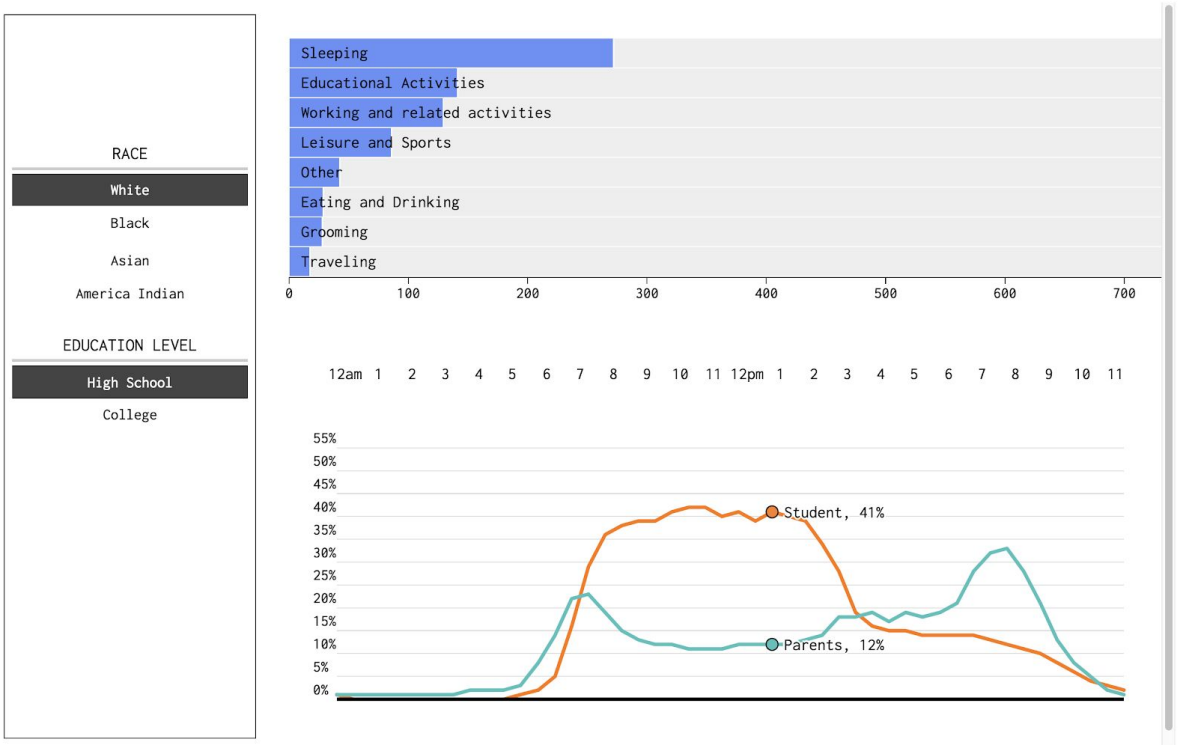




Final Design

In final design, we had some modification on our drafts, in order to make this visualization in integrity and consistent with other visualizations, in specific:

- We fit the graph and the filter in one row, to make it more integrate.
- We rotate the bar chart, since the name of activities can be fit in row.
- For consistent with visualization 1, we adjust the color of bar when we click different ethnic group.
- We added a tooltip in the visualization, thus the data in the graph is more understandable
- Since the quantity of the samples in each ethnic group is different, we changed the y axis of the line chart from count to percentage



There are two visualizations included in this section, we are trying to infer whether Asian parents have impact on the students studying time.

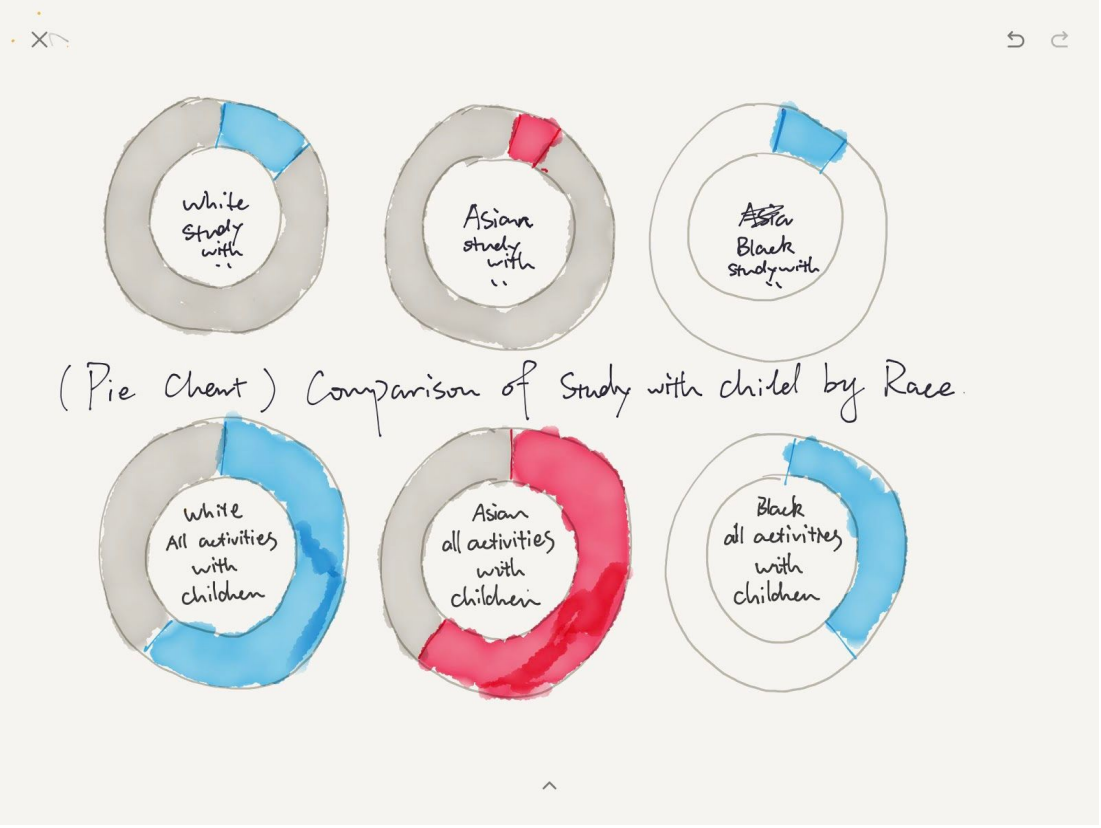
- The visualization on the left shows the average time of each student's activity, by their different races and education level. The y axis represents different activities, besides, the x axis is the average time.
- The visualization on the right indicated the percentage of students that student on study, which is colored by orange, and the percentage of mother spend their times on education activities with their children, which is colored by green, the x axis represents the time period, also, we have a tooltip when the mouse is over the line area of the graph
- Compared with the two visualization, high school Asian students spend relatively less time on studying or doing work, on the contrast, college Asian students pay more attention on working or studying. However, the current study have not yet to find significant evidence to support or refute

the concern that Asian mother are more tend to spend much time with children.

Visualization3 - How mother spend their time?

Initial Design

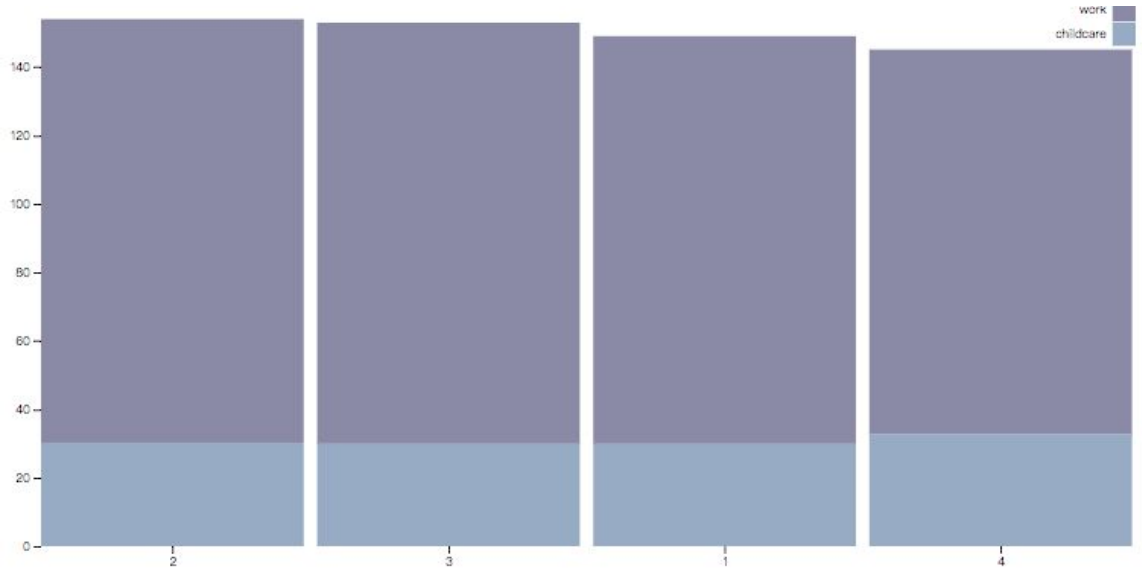
the goal of this visualization is to present how mothers in different ethnic group spend their time on study with children and some activities with their children, thinking of these activities may be time-consuming simultaneously, we tried to make two groups of pie chart.



Second Design

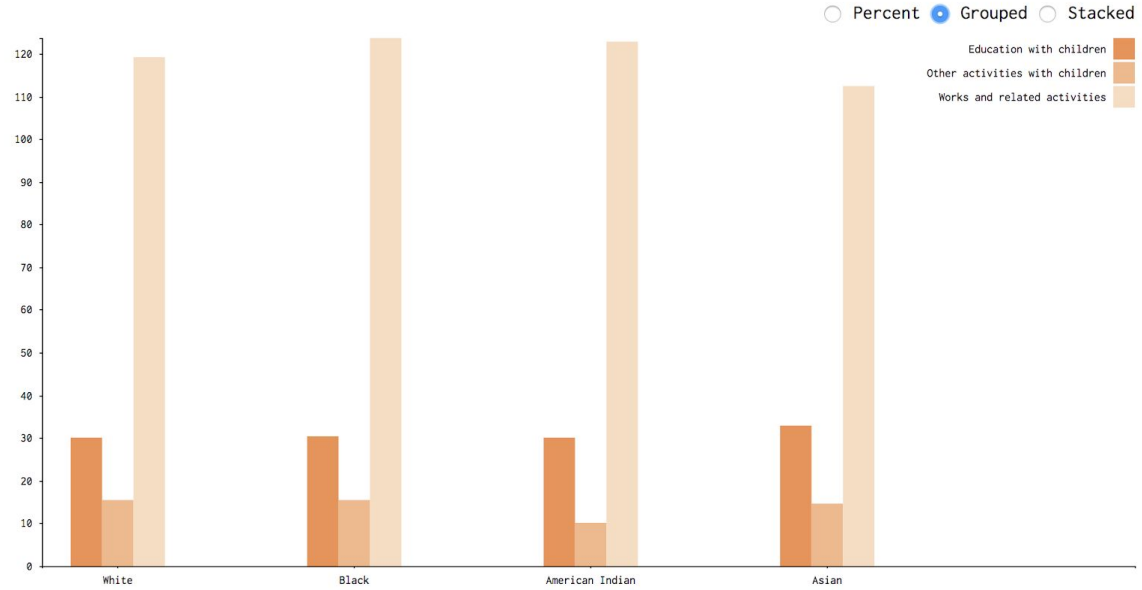
Once we made the pie chart, we've noticed that the portion of these activities are in a slight difference, thus we are thinking of using stacked bar chart to make

comparison, but we all know that it's difficult to distinguish the difference of the element (bar) that not align with the axis.



Final Design

Since using different bar chart can help us to distinguish different part of the time difference from several angles, we applied multiple bar chart views and made a transition to them. Consistent with the previous visualization, we changed the color of this graph.



This section mainly focus on how much time the mothers by different races spend time on their children, and will they push on their studies (spending more time on education activities with children), We used several types of bar charts to make comparison.

- In this visualization, different bars are representing the races, different colors are used to indicate the activity of the mother, while the y axis measures the percentage, or average time of the specific activity. We may clicked the button on the top-right to change the type of bar chart with transition animations.
- What we can tell in this graph is that, Asian mothers will prefer spend less time on their work, and spend more time on education activities with children instead, but this difference on time is not significant (only few percents)

Conclusion & Future work

Among all the visualizations, we may reach to these conclusions:

- High school Asian students pay less time on study or work, while college Asian students pay more, the change is more significant than other race.
- Mothers all willing to spend their time on education with their children, especially during the night, and before the first class in the morning. However, there isn't significant difference on the time they spend
- Combined with some other reports we have read, "Tiger mother" exists, but they are not going to spend much time on pushing their children, what they will do is they will use a more strict way of teaching their children. But if this way of education efficient, we can't give any inference in this project.

There are some limitations of this study. First, the sample is selected from an area with American population. Students in the initial sample were recruited from schools with a sizable proportion (>20%) of Asians in the student population, which is four times higher than the 5.6% that the Asian population represents in the United States. Because families function in the context of the larger community, and because tiger parenting is a culturally specific construct, other studies may not be able to replicate our results. Tiger parenting may not emerge in other areas of the U.S., where the Chinese American population is smaller, or it may emerge but not be associated with the same developmental outcomes as in the current study. Second, we didn't efficiently fetched the data of parents' which correspond to the children we have, which may result to the problematic comparison, especially in the line chart.

There are at least two future research directions to consider. First, the effect of parenting practices may depend on the child's own characteristics. Chua's (2011) book shows that tiger parenting may not result in the same developmental outcomes in different children, even when they are siblings with the same tiger parent. Studies that compare the developmental outcomes of siblings can be conducted in the future to see how each child's specific characteristics can affect

the way tiger parenting and other parenting profiles relate to adolescent outcomes.
Second, we can identify parenting profiles in Chinese American families and explore their effects on adolescent adjustment. In a three-wave longitudinal design spanning eight years, from early adolescence to emerging adulthood, adolescents (54% female), fathers and mothers from 444 Chinese American families reported on eight parenting dimensions (e.g., warmth and shaming) and six developmental outcomes (e.g., GPA and academic pressure).

Project Logistics

The work load of this project was split evenly across team members, and we were in constant communication to make sure everyone was on the same page and agreed to the designs. While everyone had a fair chunk of all aspects of the project (from web design to implementing visualizations), each member also had focus areas, and they are shown below:

Member	Role
Chenjie Jiang	Project Organization Code master(Implementation of data visualization and website)
Chen Liang	Design master(organization of visualization/intercation ideas, overall website design) Preprocessing of the data Maintenance of the process book and screencast

Reference

1. http://www.businessinsider.com/is-there-a-tiger-mother-effect-2011-5
2. http://flowingdata.com/2017/05/17/american-workday/
3. https://bl.ocks.org/enjalot/2b1446f496c3968f6ecd
4. http://bl.ocks.org/mstanaland/6100713
5. http://bl.ocks.org/arpitnarechania/6616c93c74840d87de839aab44aba77f
6. http://bl.ocks.org/Potherca/b9f8b3d0a24e0b20f16d
7. http://flowingdata.com/2016/03/03/marrying-age/