# A Research on the Population Distribution of AP Students' preferences for the weekday hated the most in BNDS

Shuo Duan (Alina), Yujia Zhang (Joyce), Yixuan Huang (Kathelin), Xinbei Li (Elsie)

G11 AP Statistics 1

Beijing National Day School, Beijing, China

## PROPOSAL

### 1. Research question:

We will investigate whether the distribution of the proportions of the AP students in BNDS who hate each weekday the most is consistent with the data collected from a research carried out by a Japanese magazine in 2015, as shown in Table 1. Because the five weekdays have distinct implications and so evoke different emotions for people, we wonder what the preference of people for each day of the week is.

*Table 1. Investigated distribution of the proportions of each weekday which is hated the most by a Japanese magazine in 2015.*

| Weekday | Monday | Tuesday | Wednesday | Thursday | Friday |
|---------|--------|---------|-----------|----------|--------|
| Proportion | 0.57 | 0.14 | 0.11 | 0.10 | 0.08 |

### 2. Background research:

There were many relevant scientific results regarding which one of the weekdays is hated the most and why. The first related work is carried out by Wenzhou Business Daily, which surveyed the distribution of the day of a week which people hate the most and found that more than half of the participants dislike Mondays the most, while from Tsinghua University Behavior and Big Data Lab, people have the most negative feelings on Wednesdays. However, a second study backs up the attitude that Monday may be unpleasant by listing the psychological reasons why people may hate Mondays. For instance, Monday can refer to messed-up natural body rhythm, lost freedom, the lack of love for people's work, social anxiety, and culture influences. Thirdly, according to the researchers of the London School of Economics, the mean reported happiness dropped significantly from Monday to Tuesday and strictly increased throughout the rest of the weekdays, which gave the lowest average response on Tuesday. In conclusion, the different opinions of the existing research about the most hated weekday with a slightly stronger inclination toward Monday leave us a research gap to carry out further investigation.

### 3. Sampling and Experimental Design:

- Variables: the proportion of students who hate each weekday

- Type of study: This study is an observational study because there are no treatments assigned to the students.
- Data collection: We will perform a simple random sampling with replacement and select 63 students. The data was collected from the questionnaire that we will force the 63 students to fill out.
- Scope of inference: The findings can be generalized to all students in the AP program in BNDS.

**4. Exploratory data analysis:**
We will conduct a chi-square goodness-of-fit test for the population distribution of the proportion of AP students in BNDS who hate each weekday the most. The sample size is 63, while the population is 400 AP students. Since the sample is chosen randomly with replacement, it is reasonable to assume that the responses are independent, and the statistic is unbiased, thereby assuring us that the results can be generalized to the population. The expected counts are all at least 5, so the sample is large enough to assume that the use of chi-square distribution is appropriate. Therefore, all the conditions for inference have been met.

**5. Group task assignments and timelines:**
The proposal and data collection will be done by May 17th. The introduction will be done by May 19th by Alina Duan. The background research and methods and procedures will be done by May 24th by Joyce Zhang. The analysis will also be done by May 24th by Kathelin Huang. The suggestions and conclusion will be done by May 25th by Elsie Li. The project will be completed and submitted by May 26th 4:30 p.m. The presentation will be done in class.

**6. Data:**
To test the feasibility of our proposal, we adopt a set of data from Wenzhou Business Daily in 2014 that investigated the distribution of the day of a week which people hate the most. The sample proportions of participants who choose each day of the week as their the most hated one is shown in Figure 1.
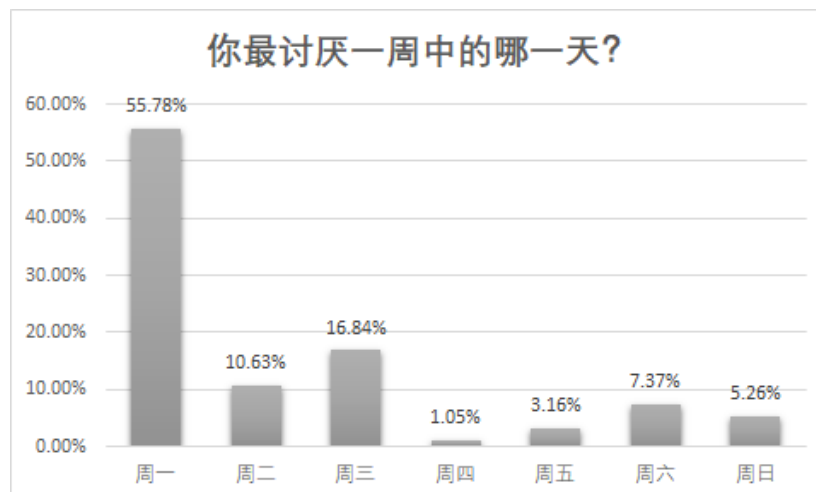


你最讨厌一周中的哪一天？

周一 55.78% 周二 10.63% 周三 16.84% 周四 1.05% 周五 3.16% 周六 7.37% 周日 5.26%

*Figure 1. Sample proportions of participants who choose each day of the week as their the most hated one by Wenzhou Business Daily in 2014*

Because the investigation includes the weekends as their options, we adjust the data by first calculating the number of participants who selected a weekday by subtracting the number of people who choose a weekend from the total number of participants. Then we calculate the number of people for each category by multiplying its proportion by the total number of people. Finally, we obtain the proportions for each weekday by dividing the number of participants in each category by the total number of participants who selected a weekday, as shown in Table 2.

*Table 2. Adjusted sample proportions of participants who choose each weekday as their the most hated one by Wenzhou Business Daily in 2014*

| Weekday | Monday | Tuesday | Wednesday | Thursday | Friday |
|---|---|---|---|---|---|
| Proportion | 0.630 | 0.123 | 0.192 | 0.014 | 0.041 |

7.References:
[1] Zhao, C, Liu, T. (2014, March 17). Survey: What day of the week do you like best and what day do you hate most.
http://news.66wz.com/system/2014/03/17/104036222.shtml
[2] Bologna, C. (2020, November 16). Experts Explain Why Mondays Are So Psychologically Hard. HuffPost.
https://www.huffpost.com/entry/why-mondays-hard-psychologically_l_5fb0375ac5b68baab0fcbf8c
[3] MacKerron, G., & Mourato, S. (2010, October 28). LSE's mappiness project may help us track the national mood: but how much should we consider happiness in deciding public policy?
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