Survey Context

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- California **mandated later start times** for schools starting in the 2022-23 school year.
- Dr. Delarue and his team collaborated with San Francisco Unified School District (**SFUSD**) to restructure schedules for over 100 schools in the district by the 2021-22 school year.
- Goals of restructured schedules were to optimize bus usage, reduce costs, and fulfill the state mandate.
- A survey was conducted to assess the satisfaction of parents (mostly) after to the new school schedules.
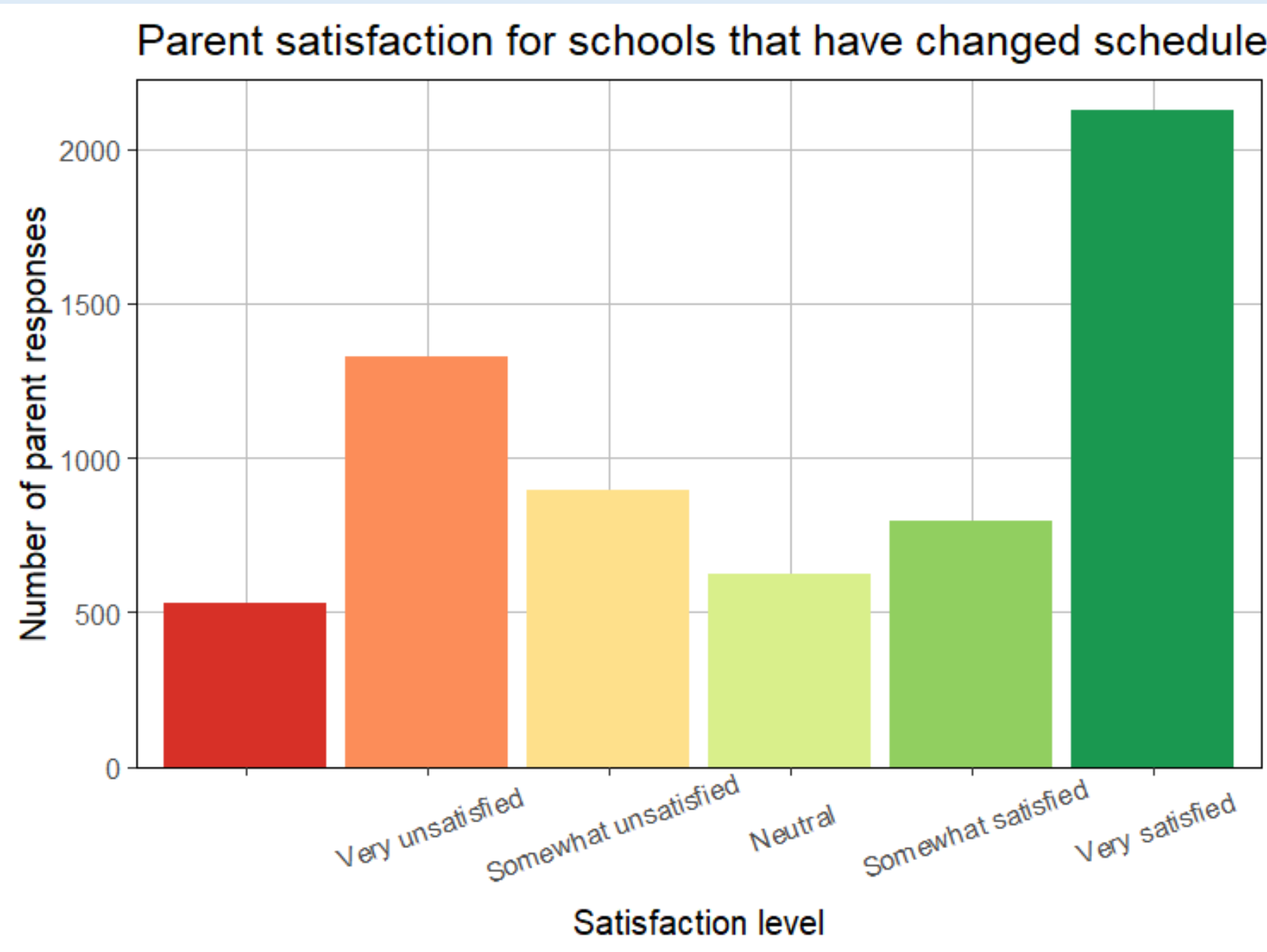
Surprise? Parents might like changing school schedules

Raw Satisfactions

"How satisfied are you with the new start and end times?"
- 1: Very unsatisfied, 2: Somewhat unsatisfied, 3: Neutral, 4: Somewhat satisfied, 5: Very satisfied

3.26
(excluding 531 blanks out of 6304 responses)
On average, families were more satisfied than not

Parent satisfaction for schools that have changed schedule

Race/Ethnicity	Average satisfaction
Pacific Islander	3.68
Asian	3.41
Two or More Races	3.25
White	3.24
Filipino	3.14
Decline to State	3.11
African American	2.98
American Indian or Alaskan Native	2.90

Representativeness

Reweighted features reveal that the sample is representative of the school district

Original formula to calculate average satisfaction:
$$\bar{s} = \sum_g \boxed{\frac{\text{number of responses in group } g}{\text{total number of responses}}} \sum_i \frac{\text{satisfaction score of response } i}{\text{number of responses in group } g}$$

Corrected formula
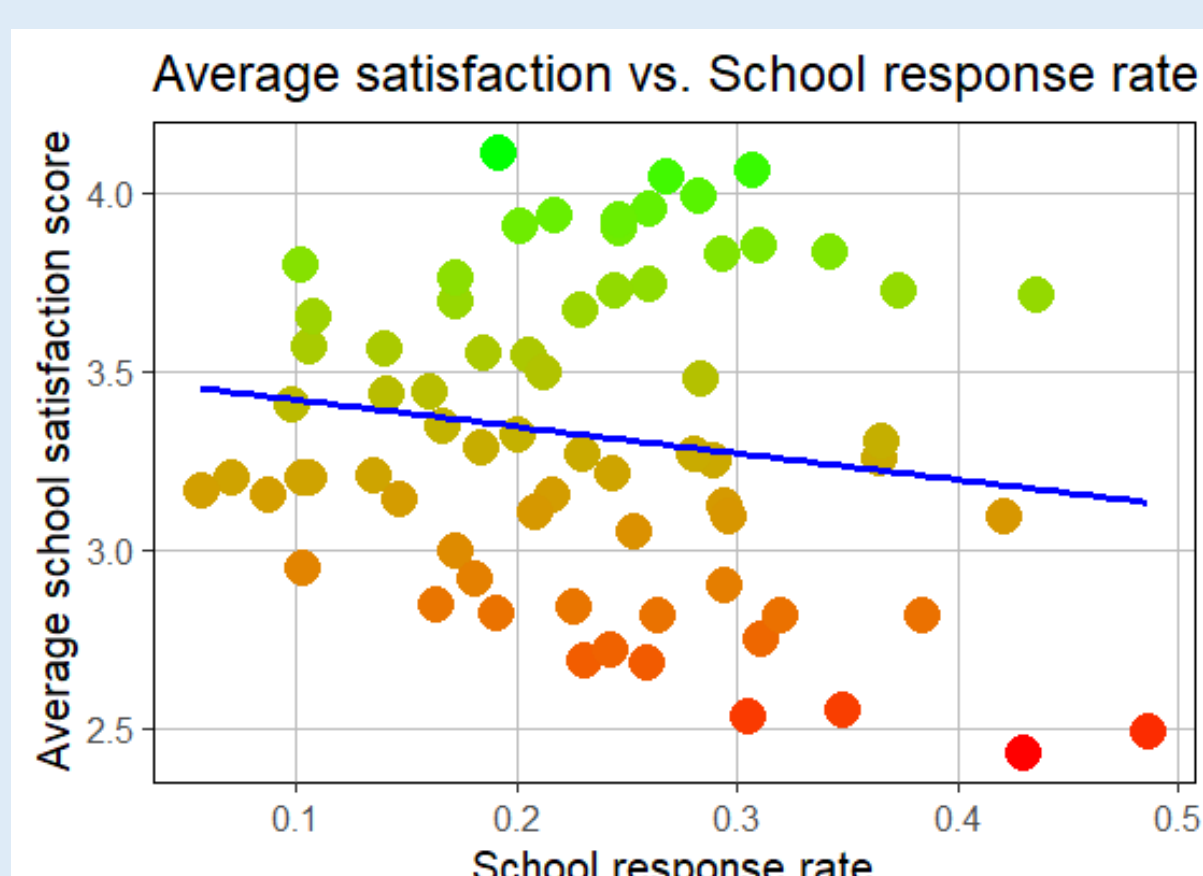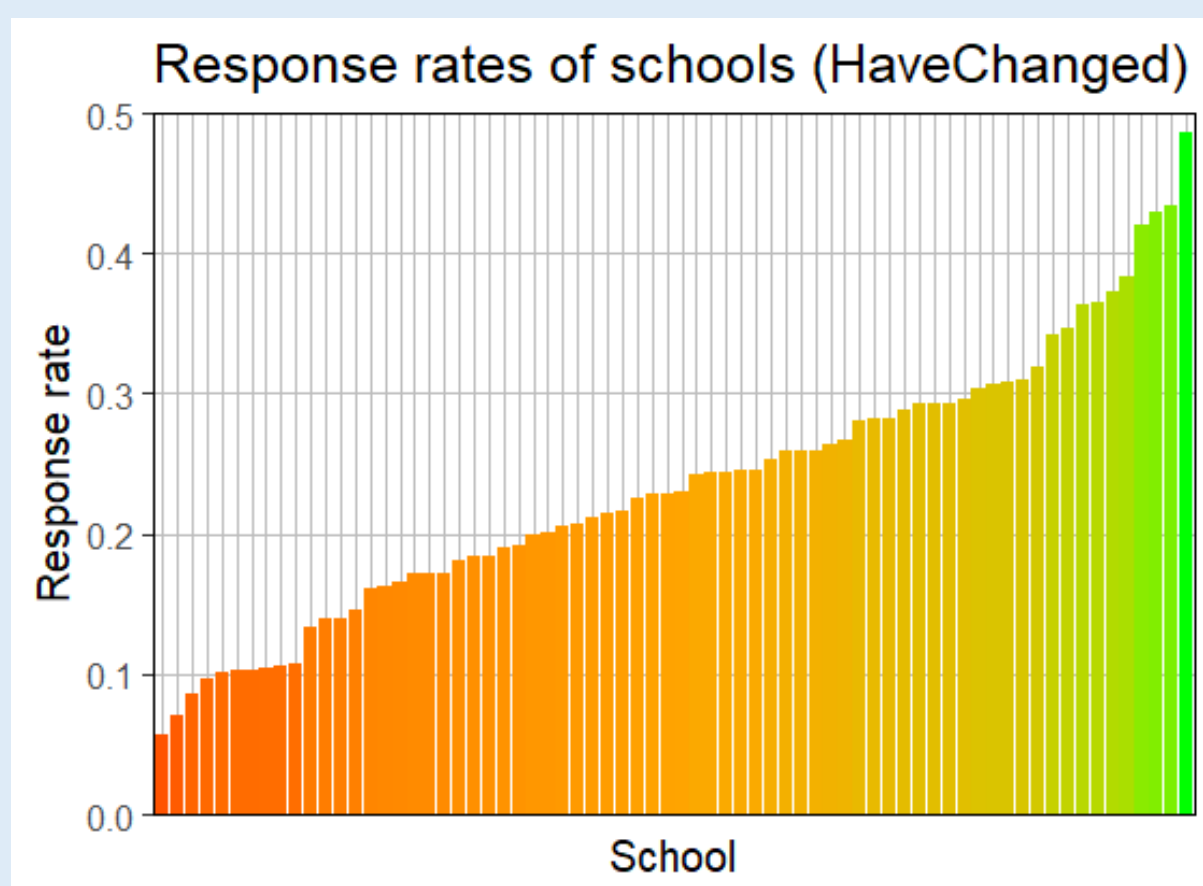$$\bar{s} = \sum_g \boxed{\frac{\text{total members of group } g}{\text{total members of all groups}}} \sum_i \frac{\text{satisfaction score of response } i}{\text{number of responses in group } g}$$

- Replaces the original weight of the average satisfaction a group based on the group's proportion in the survey with a new weight based on the **group's proportion in the district census**
- Reduces response bias by correcting for any underrepresented or overrepresented groups

Corrected feature	Difference from average raw satisfaction
Race/Ethnicity	+0.02
Hispanic or Latino	+0.02
English learning student	+0.02
Special education student	+0.01
School attended (population)	+0.04

The most varied response rates came from the schools.
- There is a group of schools with a response rate under 10%, but the rest vary from 10% to almost 50%.
- There is a slight negative relationship between school response rate and satisfaction.

Response rates of schools (HaveChanged)
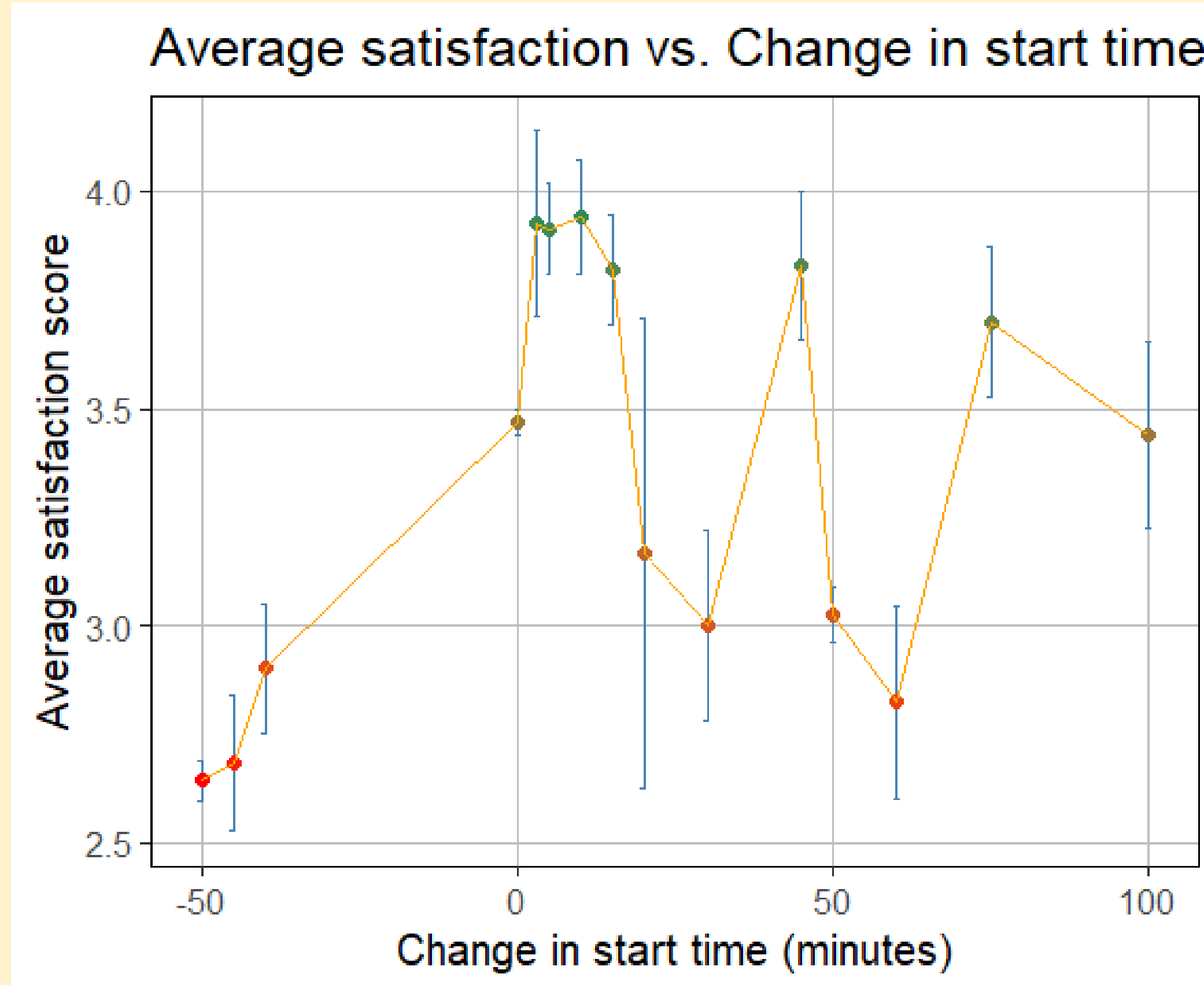

Average satisfaction vs. School response rate

Significant Features

After adjusting for the fixed effect of schools, there were a few features that remained to have an influence on satisfaction.

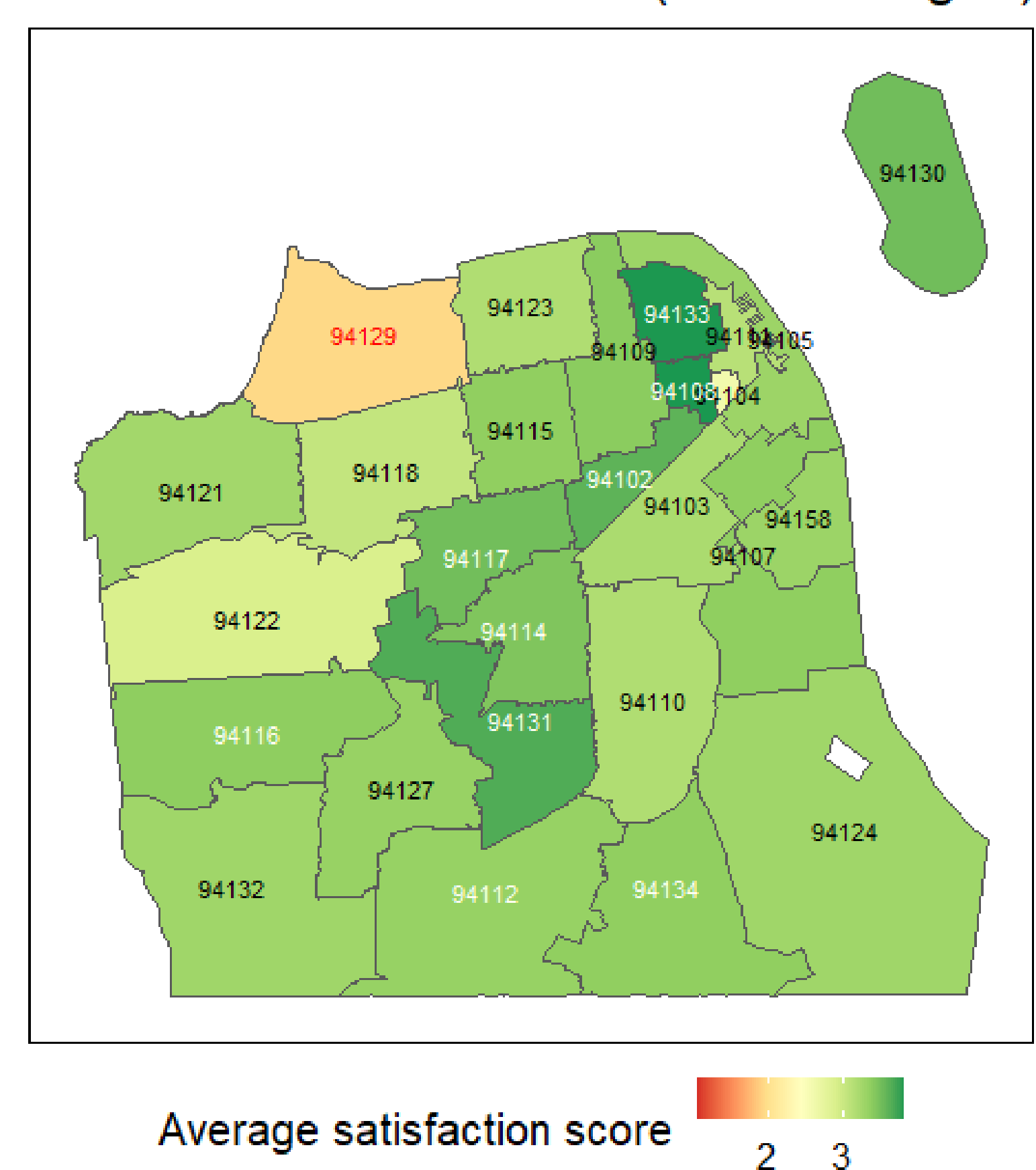| Feature	Category	Sign of Coefficient	Degree of Significance
Race	Asian	+	***
Race	Two or More Races	+	*
Zip code	94129	-	*
Change in Start time	Change in Start time	-	*

(59 schools with a significant fixed effect)

Generally, each additional minute that a school start time is moved later, average satisfaction reduces by 0.031

Average satisfaction vs. Change in start time

The Presidio of San Francisco (zip code 94129) is the only area of the 29 zip code options that negatively determines satisfaction

Parent satisfaction in SF (HaveChanged)
Average satisfaction score

Importance of Choice

Parents who got their 1st choice:
4.09
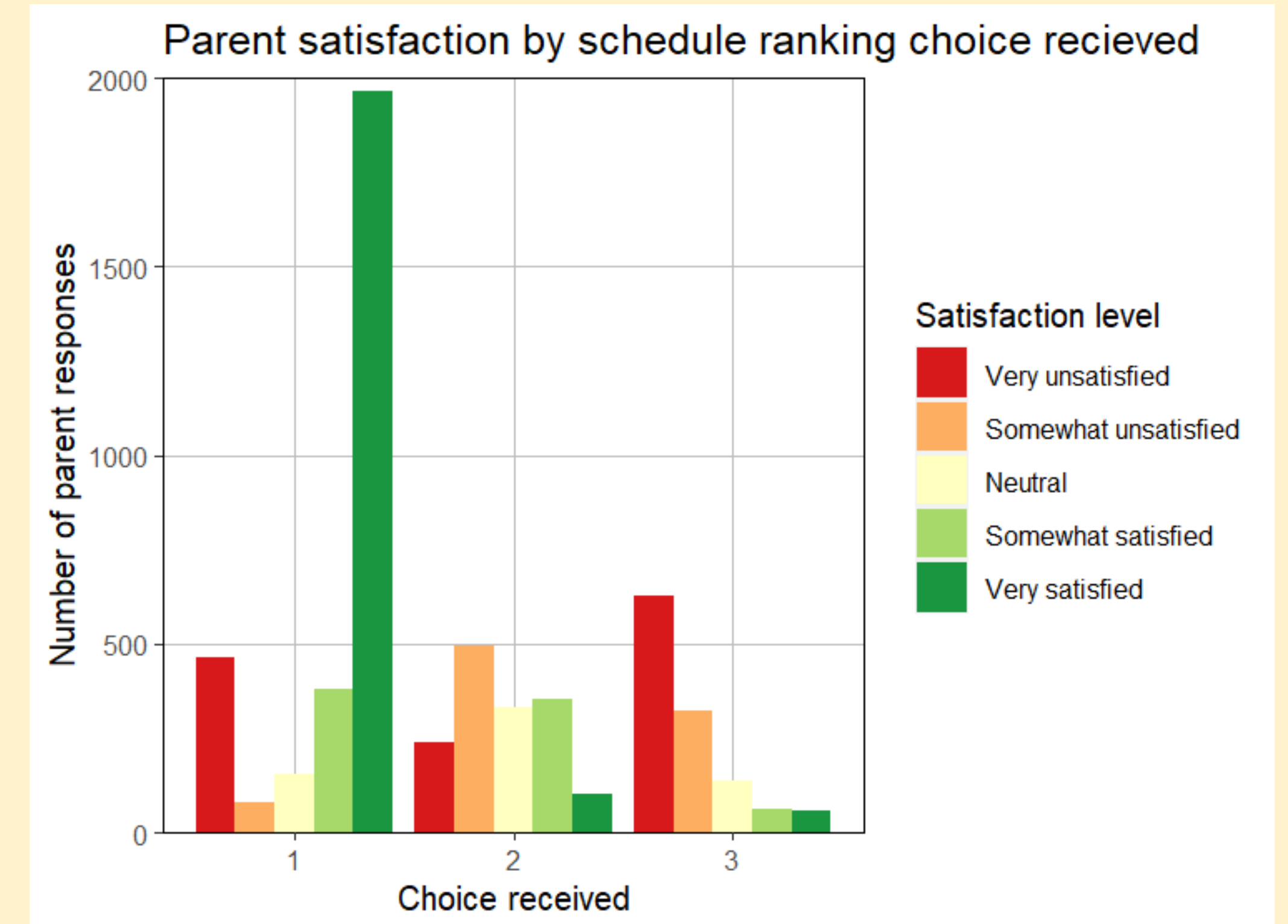a little better than somewhat satisfied

Parents who got their 2nd choice:
2.73
worse than neutral

Parents who got their 3rd choice:
1.84
worse than somewhat unsatisfied

Parent satisfaction by schedule ranking choice recieved

Despite receiving their first choice, there were many parents who were very unsatisfied
Linear regression reveals that negative impacts on 1st choice satisfaction come from:
- **African American** (race)
- **94104** (zip code)
- **Change in start time**
Positive impacts on 1st choice satisfaction come from:
- **21 of 70 schools**

Though right-skewed, the second-choice distribution is almost normal
Negative impacts on 2nd choice satisfaction come from:
- **American Indian or Alaskan Native** (race)
- **94115 and 94122** (zip codes)
Positive impacts on 2nd choice satisfaction come from:
- **5 of 70 schools**

Unsurprisingly, the third-choice distribution exhibits exponential-like decay
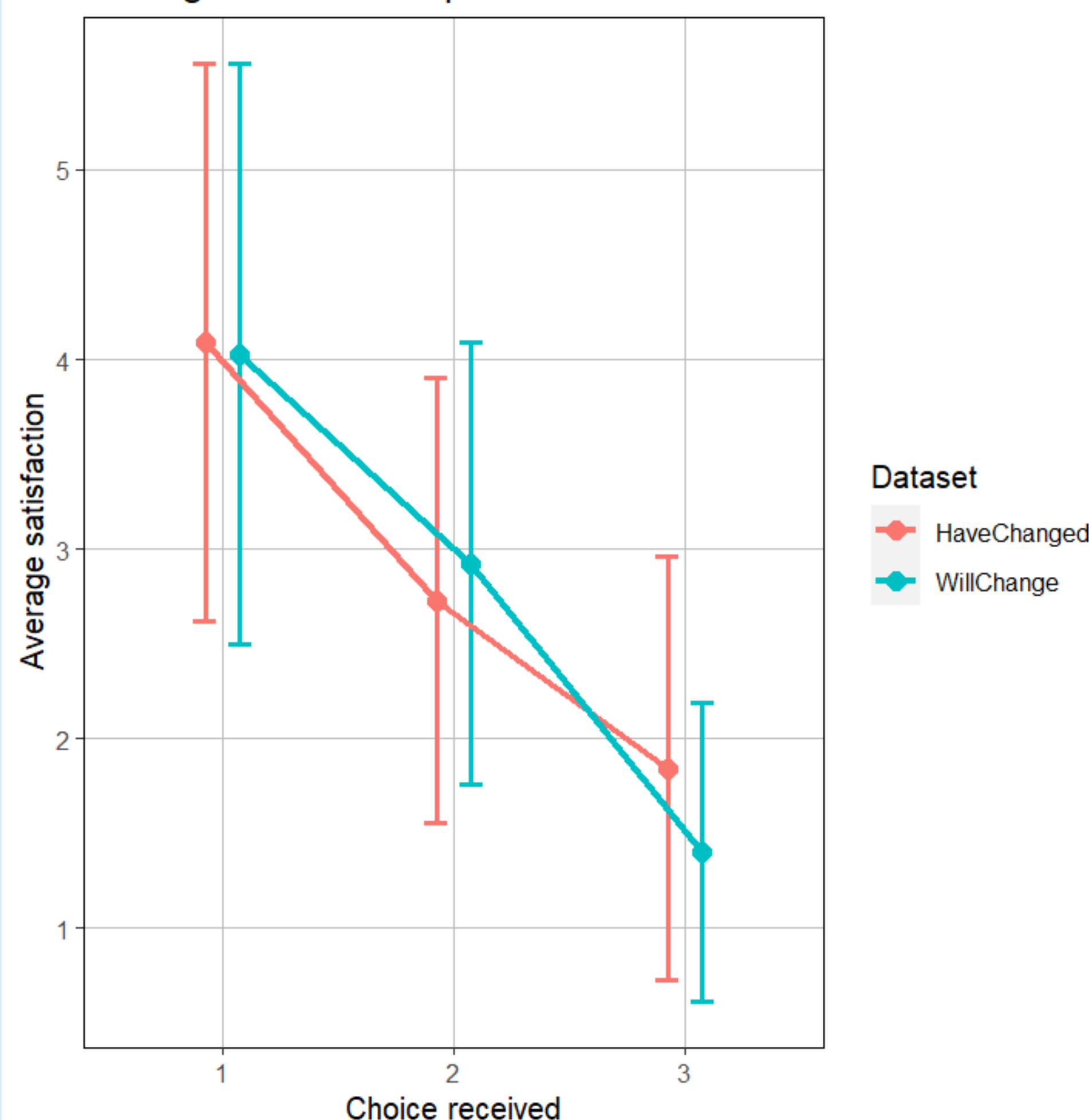Negative impacts on 3rd choice satisfaction come from:
- **94133** (zip code)
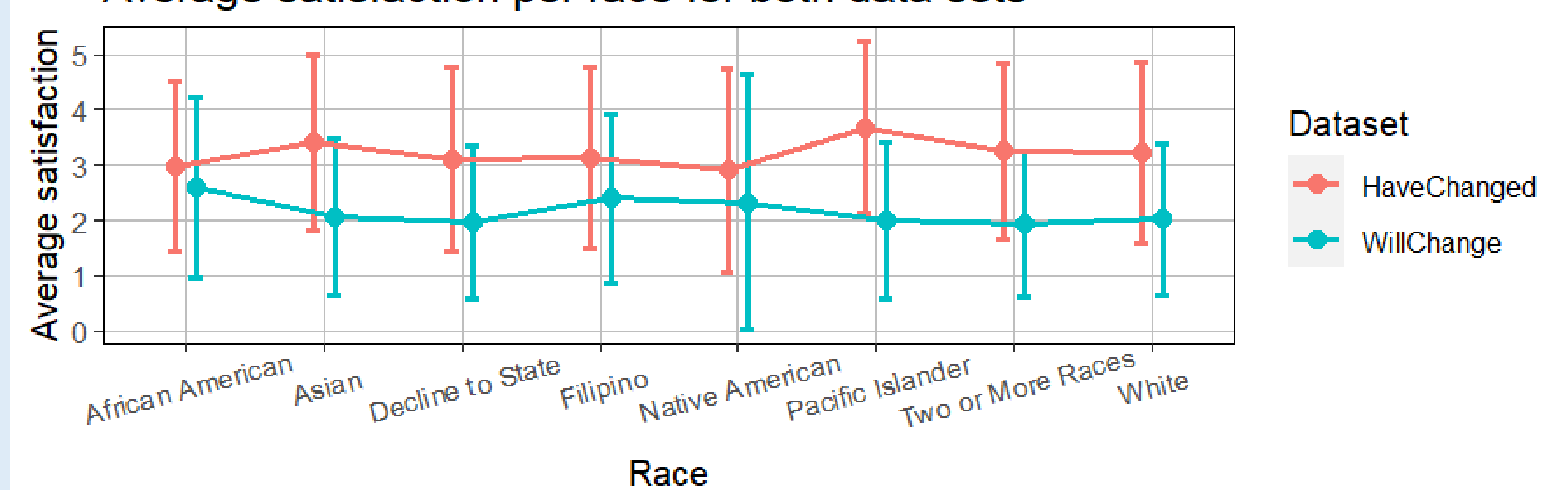Positive impacts on 3rd choice satisfaction come from:
- **Asian** (race)
- **Hispanic or Latino**
- **11 of 29 zip codes**

Comparing two subsets

Average satisfaction per choice for both data sets

Average satisfaction per race for both data sets

Average satisfaction vs. Change in start time for both data sets