

Sour Patch Kids

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What

For MATH 280 (introduction to statistics), we were given a qualitative project in which we got to choose our own question. I chose to ask "what percentage of Sour Patch Kids were yellow?" Since I could easily get my data as opposed to someone who did a survey.



Hypothesis and Testing

My hypothesis for the question was simple. Since there are 5 colors in a bag, my guess was a simple 20% of them were yellow. Using a simple random sample, I found a large bag that had more than enough needed to collect data. There was a minimum of 120 pieces needed to count. I poured them out on a plate, separated by color, and started my count.



The math involved

Confidence Interval

Parameter: What is the true percentage of all Sour Patch Kids that are yellow?

Statistic: In a bag of Sour Patch Kids that contained 339 Sour Patch Kids, 61 of them were yellow. Giving me a percentage of 18%.

$$\text{Margin of Error: } z \sqrt{\frac{\hat{p}(1-\hat{p})}{n}} = 0.0408 = 4.08\%$$

$$z=1.96$$

$$\hat{p}=0.18$$

$$n=339$$

Confidence Interval: (13.92%, 22.08%)

Conclusion: I am 95% confident that the true percentage of all sour patch kids is between 13.92% and 22.08%.

Hypothesis Test

Parameter and Hypothesis: What is the true percentage of all Sour Patch Kids that are yellow? Hypothesis (p_0) = 20%

$$\text{Test Value: } z = \frac{\hat{p}-p_0}{\sqrt{\frac{p_0(1-p_0)}{n}}} = -0.92$$

$$p_0 = 0.2$$

$$\hat{p} = 0.18$$

$$n = 339$$

$$p\text{-value: } 0.3576$$

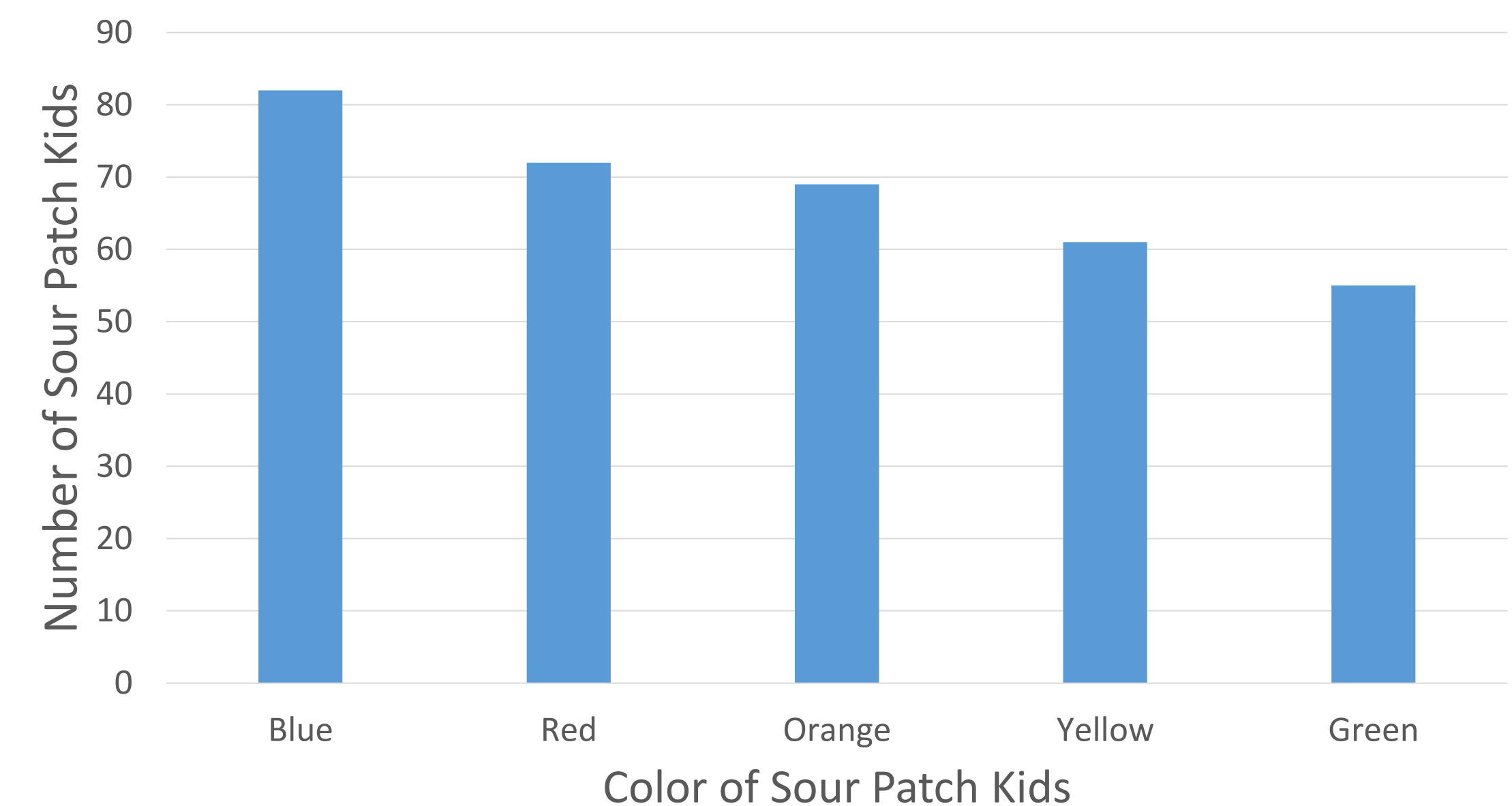
Decision Rule: Is $0.05 > 0.3576$? No, do not reject (H_0)

Conclusion: With 95% confidence, I do not have enough evidence to prove that the true percentage of all Sour Patch Kids that are yellow is significantly different from my guess of 20%. My guess is reasonable.

Results and Conclusions

After counting out all of the Sour Patch Kids in the bag, I discovered that the actual percentage of yellow Sour Patch Kids was 18%. My guess of 20% falls within the range of the confidence interval, and passes my hypothesis testing. Making my 20% a fitting guess for the amount of Yellow Sour Patch kids.

Number of Sour Patch Kids by Color



Percentage of Yellow Sour Patch Kids

