The Great British Bake-Off

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Abstract

Unlocking the secret recipe for viewer engagement, this report delves into the dynamic world of television ratings. Any show's success is fully reliant on its viewership and audience response. Determining the main factors related to an increase or decrease in viewers can be immensely beneficial for a show to sustain its profits and progress, and entertain viewers. Each episode of the series in 'The Great British Bake Off' has varying viewership trends. Some of the trends that seemed most critical to research in the show's success were the viewership for Final versus Non-Finale episodes, as well as the overall viewership for series 8 and after. Our analyses show evidence that the finale episode of each series has significantly more viewers than any other episode, with non-finale episodes having between 7.75 to 9.09 million viewers and finale episodes having 7.27 to 12.51 million viewers. During series 8 of 'The Great British Bake Off', the popular cooking show saw a drop in viewership during this and subsequent series, which we suspect is due to production changes. Our analysis of series 8, 9, and 10 compared to the earlier seasons shows that there is a considerable decline in viewership compared to the earlier series. These results can give producers of the show an idea of what will best draw the attention of their audience and make adjustments to up the viewership for 'The Great British Bake Off'.

1 Introduction

Season after season, "The Great British Bake Off" is loved by its fans – but are all series and episodes of the show created equal? Or is there a secret ingredient to the shows success? "The Great British Bake Off" (GBBO) is a popular baking show that has run from 2010 to present, and features ten to twelve amateur bakers that hail from the Great Britain area. Each episode consists of three different challenges: the signature challenge, the technical challenge, and the showstopper challenge. Each episode, one baker is eliminated until there are three bakers left and then one series winner is chosen, the Star Baker. We examined two different trends within viewership of this show. The first

investigates if there is a statistically significant difference in finale viewership compared to other episodes. The second discusses the series 8 changes within production of the show and consequences on viewership. This report will include an overview of the statistical methods used to analyze the significance of our research questions, then give an insight on the results of these tests and how the results can be used in the future of "The Great British Bake Off".

2 Data and Methods

2.1 Data

We sourced our data on The Great British Bakeoff from TidyTuesday (Wickham et al. 2019), an online community that posts weekly datasets to a public repository for people to share their visualizations and analyses. Included in The Great British Bakeoff package (Hill, Ismay, and Iannone 2022), posted on October 25, 2022, are four datasets, consisting of data from Wikipedia and PBS collected by Alison Hill, Chester Ismay, and Richard Iannone. The data includes information on individual episode challenges, the bakers themselves, the episode ratings, and further information on the episodes. This project only utilizes the "Bakers" and the "Ratings" datasets. All of our data analysis will be done in R Version 4.3.2 (R Core Team 2023) The Bakers dataset includes each of the 120 bakers that have appeared on the show from seasons 1-10 (2010-2019) as an observation and contains some basic personal information such as age and occupation, and multiple other quantitative variables regarding their baking challenge scores from their season. The Ratings dataset has each of the 94 aired episodes from seasons 1-10 as observations and records the episode's viewers in the millions for the first 7 days and the first 28 days. Specifically, we are interested in variable `viewers_7day` for each episode, which is the amount of views in millions within 7 days of an episode's release.

2.2 Methods

2.2.1 Data Cleaning and Manipulation

Although we did not truly manipulate any of our variables, we did add one very important indicator variable determining if an episode was a finale episode or not.

In addition, we subsetted different series of our data. To create our reduced linear model, shown in sections below, we subsetted a section of the data to only included series one through seven.

2.2.2 Statistical Analysis

We used many different methods of analysis. Firstly, this included a t-test to determine if there was a statistically significant difference in viewership between finale and non-finale episodes. For this t-test, we examined a p-value and a

confidence interval of the difference in means. Next, we applied two linear models to our data, one to a subset of our data from the first seven series, and a second linear model onto the full data. This linear model used series as a predictor for weekly viewers. As part of this analysis, we looked at the comparative r-squared values for both of the linear models, and the p-value from a model utility test.

3 Results

3.1 Finale versus Non-Finale Viewership

Firstly, we examined if there was a difference in finale vs non-finale viewership. For this, we mutated our data to create a finale indicator variable. Note: this is a character variable.

Table 1: This table displays summary statisitcs for non-finale episodes and finale episodes. These summary statistics are as follows: mean, standard deviation, median, quartile 1 and quartile 3.

type	mean	sd	median	q1	q3	observations
Non Finale Episodes	8.424	3.129	8.945	6.375	10.160	84
Finale Episodes	9.889	4.223	10.045	7.417	12.718	10

As the table shows, the finale episodes have a higher mean and median viewership than non-finale episodes. However, finale episodes have more variation than the non-finale episodes, which does make sense, as there is much more non-finale episodes (84 non-finale episodes versus 10 finale episodes).

To get a better understanding of the distribution of viewership across the series, we made a scatterplot displaying viewership by series number.

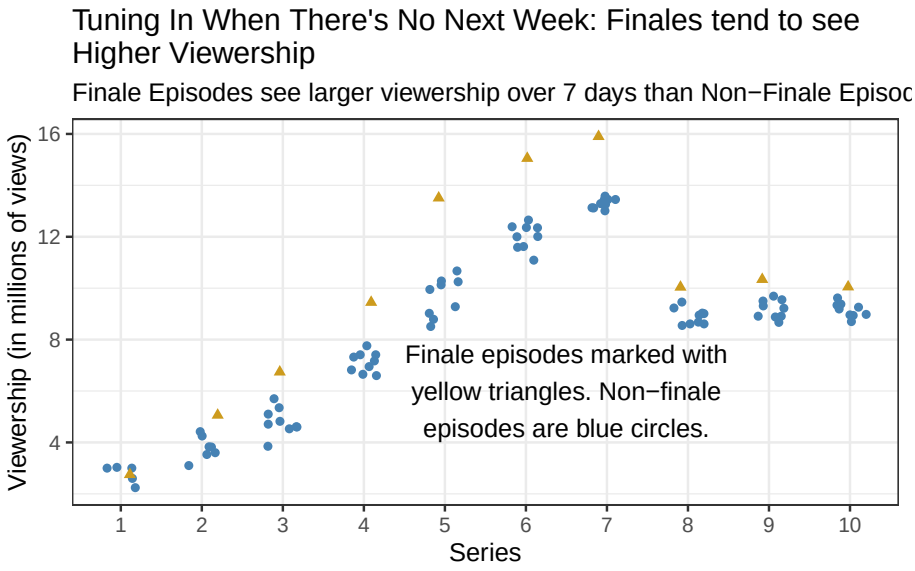

Figure 1: This graph displays the viewership by series of the Great British Bake Off, with blue dots representing the viewership for non-finale episodes and yellow triangles viewership of finale episodes, with finale episodes having consistantly higher viewership than non-finale episodes.

To determine if finale episodes have a statistically significant higher viewership than non-finale episodes, we ran a two-sample difference in means one-sided t-test.

t = -1.063, df = 10.21, p-value = 0.1561 alternative hypothesis: true difference in means between group FALSE and group TRUE is less than 0

With a p-value of 0.1561, we do not have statisitcally signifigant evidence to reject the null hypothesis. However, we will do further investigation.

In addition to these results, our t-test also provides us with a difference in means confidence interval with 95% confidence. Please note that while we used a one-sided t-test for the calculation of the p-value, this confidence interval was calculated from a two sided t-test to find the difference in means. 95 percent confidence interval: -4.528151 1.597604

3.2 Season 8 Viewership — Viewership Over Time

As seen in Figure 1, series 8 and subsequent series saw a massive dip in viewership. This was a departure from the original trend that saw an increase in viewership for every series. It is worth noting that after the initial drop in series 8; series 9 and series 10 stayed consistent in viewership. To investigate this phenomenon further, we ran two simple linear regression models fitting viewership

in the first 7 days by the series number. The first, shown in Figure 2 as the dashed blue line, is only using the first 7 series. The second model, shown as the solid orange line, uses all 10 series.

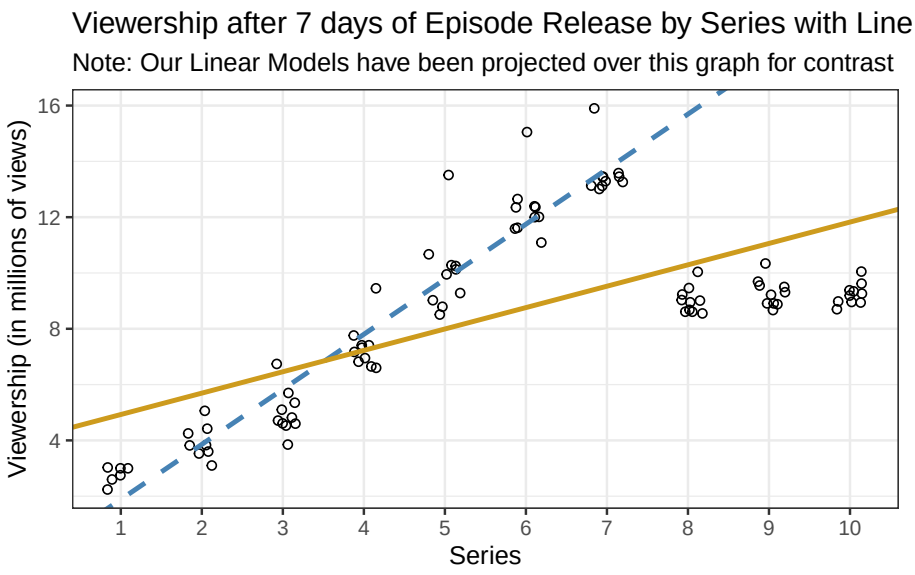

Figure 2: Graph of viewership for every episode with two lines projected onto it. Blue line is projected onto the graph showing the subsetted linear model. Yellow line is projected onto the line showing the full linear model. This graph shows how the subsetting linear model fits the first seven series extremely well, showing that series 8, 9, and 10 have a different trend.

We can see from this graph that both of the trend lines technically fit our data. However, we can see from this graph there is a strong association for the first 7 series between viewership and series, whereas the model with all 10 series is not as strong.

To compare these two models, we used R^2 values to determine how well they predict the variation in viewership, and model utility test.

Summary Statistics:

Table 2: Summary Statisitcs for Comparitive Linear Models

type	intercept	slope	r.squared	p.value
full	4.161	0.766	0.422	0
reduced	-0.089	1.973	0.931	0

4 Discussion

Our results from our t-test p-value indicate there is statistically significant evidence that the mean viewership 7 days after an episode airs is different for finale, 9.89 million viewers, and non-finale episodes, 8.42 million viewers. Our t-test also provided a confidence interval for the true difference in means. After preforming a two sided t-test is, we are 95% confident that the true differnce in means is between (7.801, 9.145). This confidence interval suggests that we are 95% confident that the true difference in means of finale episodes is 7.801 million to 9.145 million 7 day viewers higher than non-finale episodes. We can conclude that there tends to be a correlation but not causation between mean viewership of finale and non-finale episodes. Although we conducted out tests using data from every episode of "the Great British Bake Off", in order for us to draw conclusions about causation, we would need to be able to replicate each episode of each series. This process of replication would be extremely difficult because there would need to be subject blindness, but a large population is already aware of "The Great British Bake Off". Despite not being able to make conclusions about causation, we speculate that this increase in viewership associated with Finale episodes has to do with the content and stakes of these specific episodes. Each Finale episode of the series, the series winner is determined after the final three bakers compete for the title of Star Baker. It is likely that this episode has a larger audience because more people are curious to see who wins the whole series rather than who is eliminated during the preceding, ordinary episodes.

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The contrast in viewership in series 8 and beyond compared to preceding series is also a cri
It is important to note that we had census-like data because our datasets included informati
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5 Conclusion

We explored the differences in viewership for Finale and Non-Finale episodes of 'The Great British Bake Off', as well as the production changes of series 8's effect on the viewership from there on out. In order to answer these questions, we utilized t-tests and linear models to get a better sense of the data and their statistical significance. All in all, our analyses have shown that finale episodes of series have a significantly higher viewership than other episodes, and that since the production changes during series 8, the overall viewership of 'The Great British Bake Off' has declined. These differences in viewership have real consequences for the overall revenue of the show and how budgets are created for future series. Producers can take extra care when planning finale episodes, since that is when the largest audience is watching. The differences in viewership can also affect the high esteem of the title of Star Baker. Additionally, producers can try to negotiate for better airing times in an effort to bring viewership throughout the series back up. In the future, it would be intriguing to investigate the ratings based on seasons or baker backgrounds. Furthermore, researching whether the baker's background affects the shows success will provide insight into the show's winners and possibly even the viewership trends we explored.

References

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