

THE EFFECTIVENESS OF SUPER BOWL HALFTIME SHOW PERFORMANCES ON
INCREASING AN ARTIST'S FANBASE

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By:

Jacob T. Linden

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Abstract

The purpose of this thesis is to test the effectiveness of NFL Super Bowl halftime show performances and the ways in which Super Bowl performers are benefitted by their Super Bowl appearance. The study analyses the halftime show's effect on the most recent years of super bowl performers to understand how these performers' popularity and fanbases are impacted by their halftime shows. It builds on the previous research regarding Super Bowl halftime performers by extending the timeframes of before and after the Super Bowl to understand the long-term and lasting effects of an artist's performance. The study also uses popularity measures such as followers across several different platforms and listeners on music streaming services in order to gain a better understanding of a performer's popularity as opposed to solely analysing music sales and consumption for these artists. The findings of this study confirm the findings of previous literature and suggest that Super Bowl halftime show performances could have lasting beneficial impacts on an artist's overall popularity and fanbase growth.

KEYWORDS: (National Football League, Super Bowl, Halftime Show, Performers, Popularity, Fanbase, Followers, Spotify Listeners)

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1. Introduction

The NFL's Super Bowl game is seen as the most effective promotional and advertising event in existence. For many years, the National Football League's Super Bowl has been seen as the largest televised advertising event of the year. The NFL's championship game is becoming known as the "Super Bowl of Advertising" because of the high level of viewership that the event has to offer (Dotterweich and Collins, 2005). Companies believe that these high viewership levels will lead to a significant increase in brand share and brand capital (Hartmann and Klapper, 2014). While companies benefit from the exposure that the game's advertising has to offer, musicians and artists have also found the event to be an increasingly effective way to grow their fanbase and gain popularity. The creation of the Super Bowl halftime show opened the door for well-established artists who were looking for the increased exposure that a worldwide promotional event such as the Super Bowl has to offer (Kelly et al, 2020). However, it remains to be seen whether or not the Super Bowl's halftime show leads to lasting growth in a performer's popularity and overall fanbase after the event has taken place.

This thesis will examine the effectiveness of Super Bowl halftime shows and analyse the extent to which a halftime performance leads to increased listeners and followers in an artist's career. It will use an extended timeframe as compared to previous research on Super Bowl halftime performers in order to depict the long-term effects of an artist's halftime performance and see if the artists' fanbase growth and increased popularity is a lasting result of their Super Bowl appearance. It will also use statistics for artists' followers and listeners across several different music streaming, social media, and video platforms in order to properly depict an artist's overall popularity.

Since the first Super Bowl halftime show that included a performance by a major artist, Michael Jackson in 1993, many musicians have used the prestigious halftime show performances in order to grow their fanbase and increase the demand for their music. The NFL originally began the Super Bowl halftime show performances by popular musicians in order to maintain viewership levels through the halftime of the event and keep viewers invested in the game. This helped to ensure that the viewership numbers anticipated by advertisers were met (Kelly et al, 2020).

Since the creation of the halftime show, the sponsor for the show as well as the network that is broadcasting the game have both been consulted by the NFL regarding the selection of the performers (Kelly et al, 2020). The creation of this new halftime event allowed for the halftime show to become an extremely desirable event for musicians looking to perform for the same large viewership audience that advertisers seek during the Super Bowl. These halftime show musicians perform with the hopes that the extreme viewership numbers achieved by the Super Bowl will lead to an increase in their music sales and streaming as well as their ticket sales for future concerts (Kelly et al, 2020).

There are even many added benefits included in performing during the Super Bowl halftime show aside from the exposure and the large viewership levels achieved by the Super Bowl game each year. Artists are given a running time for their performances of between 12 and 13 ½ minutes. Since the performance is viewed as a promotional event for these musicians, they are effectively receiving a lengthy advertisement spot in the most prestigious and sought-after advertising event of the year (Kelly et al, 2020). The key advantage for these artists is that they are not required to pay the advertising rates for this air time during the Super Bowl. This means that the 12 to 13 ½ minute advertising slot is essentially free to the performers.

With the extremely high cost of a Super Bowl advertisement as well as the substantial equivalent advertising value of the halftime show, this free block of promotional air time for an artist is a main selling point that shows the halftime show's potential profitability and effectiveness (Kelly et al, 2020).

Another main benefit for the performers is that they are not required to pay for the production costs associated with the halftime show. Instead, the NFL covers the production costs which can be as much as \$25 million. This high production cost being free of charge for the musicians performing in the halftime show is another substantial and highly convincing aspect of the event that makes it so desirable for performing artists (Kelly et al, 2020).

However, there are questions as to whether the Super Bowl halftime show truly is the best venue for already established and highly popular artists looking to grow their fanbase, increase the demand for their music, and boost their overall success in their careers. Musicians performing in the halftime show do not get paid in a way that aligns with the revenue they would otherwise generate from ticket sales in a normal concert setting. Instead, they are paid the union scale of the Screen Actors Guild-American Federation of Television and Radio Artists (SAG-AFTRA). The SAG-AFTRA contract scale rate pays \$584 as compared to the potential millions of dollars that a musician popular enough to perform in the Super Bowl would normally generate from one of their concerts (Kelly et al, 2020). This means that there is an extremely high opportunity cost associated with performing in the Super Bowl halftime show for these musicians. Their performance with this pay rate versus the revenue they would generate in a typical concert means that they are almost volunteering when choosing to perform during the Super Bowl (Kelly et al, 2020). They are assuming that the worldwide exposure and viewership levels will make up

for the drastically low pay rate and that they will be able to reach a substantial number of viewers and effectively grow their fanbase, leading to increased success in their careers.

The major question is whether the viewership and audience of the Super Bowl is the correct audience for these musicians and if these viewers will become a part of an artist's fanbase after their Super Bowl performance. Much like the reasoning for established corporations to withdraw from Super Bowl advertisements because of their potential ineffectiveness for large brands, if exposure from the Super Bowl does not increase the popularity of these already established artists, then they should not choose to perform in the halftime show (Dotterweich and Collins, 2005).

In order to gain a better understanding of the effectiveness of Super Bowl Halftime shows as it relates to increasing artist popularity, it is necessary to build upon the methods used in previous research. By using a larger timeframe from before and after the Super Bowl has taken place as compared to previous studies for the performing artists, we can see the long-term effects of an artist's Super Bowl halftime show on increasing their fanbase and overall popularity. This will allow us to understand whether performing during the Super Bowl will lead to lasting increases in popularity for artists as opposed to short-term popularity boosts that fade over time. By analysing artist statistics such as Spotify listeners, YouTube subscribers, Instagram followers, and Spotify followers we can attain a more realistic depiction of an artist's fanbase growth as compared to previous studies which solely analyse music consumption and sales for the performing artists.

2. Literature Review

The work of Smith and Smith, 2008 describes the entertainment impact of the Super Bowl and its halftime show when it states, “The magnitude of this event can be realized simply by gauging the popularity of performers who have graced the Super Bowl’s stage” (Smith and Smith, 2008). Musicians performing in the Super Bowl’s halftime show have been some of the most popular and famous artists in their respective genres. This points to the prestigious nature of the event and explains why it is such a sought-after promotional opportunity for artists looking to grow their fanbase. Not only does the Super Bowl’s high viewership lead the halftime show to be a desirable performance for artists, but the added exclusivity of having performed in a Super Bowl among the many other world-famous performers from previous halftime shows is a selling point for many musicians (Smith and Smith, 2008).

Another research study conducted by Reiley and Lewis, 2013 examines the internet searches at the time of the Super Bowl game sheds light on how impactful and beneficial it can be for artists who are involved in the halftime show entertainment. The study examines the 2011 Super Bowl in which both the Black Eyed Peas and Usher were performers. The study found that there were two separate spikes in searches for both The Black Eyed Peas and Usher. These two spikes in internet searches took place during the halftime show of the 2011 Super Bowl as well as immediately after the Super Bowl game had ended. The drastic spikes in internet searches related to both performers during and after the event took place show how impactful a Super Bowl halftime show can be for any musician. The increase in internet searches points to the immense exposure that halftime performers receive, and it also shows why the event is seen as such an effective venue for artists looking to grow their fanbase. The extreme viewership levels of the Super Bowl as well as the

simultaneous increases in internet searches hint at the potential promotional benefits of the halftime show for the performers (Reiley and Lewis, 2013).

The work of Clark et al, 2009 surveyed several different people regarding their perceptions of the Super Bowl and the Super Bowl's entertainment. Participants were asked the extent to which they agreed with several statements and they answered on a scale from 1 to 4, 1 meaning that they did not agree at all and 4 meaning that they completely agreed. The survey found that large numbers of respondents agreed with the selections for the performers of the Super Bowl halftime show. Respondents also overwhelmingly answered that they always watch the halftime performances during the Super Bowl game with a mean score of 3.42 out of the 1 to 4 scale. Participants in the survey also reported that the halftime show performers enhanced their enjoyment of watching the Super Bowl each year and some even responded that the Super Bowl halftime show performances are the main reason that they even watch the game at all. All of these survey responses that were included in this study point towards the Super Bowl's halftime show as a main attraction separate from the game itself that enhances viewer enjoyment. Because of the halftime show's importance to the overall entertainment of the Super Bowl viewers, halftime performers and artists looking to perform in the halftime show can expect high levels of exposure and potentially drastic increases in their fanbase after their performances (Clark et al, 2009).

Previous research examining the effectiveness of Super Bowl halftime show performances on boosting artists' careers showed that the choice to perform in the Super Bowl halftime show was a beneficial decision leading to increased success for these musicians. A study conducted on the song consumption levels for 8 different performing artists from the 2014 to 2017 Super Bowls showed that these Super Bowl performers' careers were significantly impacted by their halftime show appearances.

The artists in this sample saw percentage increases in their average daily value of weighted song consumption ranging from a 5% increase to a 2526% increase (Kelly et al, 2020). With significant increases in artists' average daily value of song consumption such as this, the study showed that performing in the Super Bowl halftime show is a highly beneficial promotional tool for musicians that can substantially impact their careers (Kelly et al, 2020).

The study used a sign test to compare the song consumption levels for each artist. This sign test compared the consumption levels in the seven days before their halftime show performance to the day of the performance and seven days after the performance took place. This allowed them to see the impact of the performer's halftime show on their numbers for music streams and music sales. The study found that the musicians' song consumption or music streaming and music sales after the Super Bowl performance were significantly larger than their consumption levels before the Super Bowl. Because of the significant increase in song consumption levels after the performances, the study was able to conclude that each artist's halftime show performance had a significant and positive impact on their career (Kelly et al, 2020).

3. Theory and Methodology

This paper builds on the work of Kelly et al, 2020. I will be using a Wilcoxon test to determine whether there is a change in artist followers and listeners before and after the performance. A Wilcoxon signed rank test is used as a counterpart to a t-test and is employed when the data observed is not normally distributed. This is the ideal test for Super Bowl halftime artist statistics since the data for halftime performers is non-parametric. The Wilcoxon signed rank test is used to compare two dependent samples and understand the difference between the two samples (Wilcoxon Signed Rank Test, 2017). It is especially useful in the case of Super Bowl halftime performers since it allows us to compare the same variable before and after an event takes place. In this case, the test is used to compare the Super Bowl halftime performers from before the event of the halftime show to after the event has occurred. It allows us to see the impact of their Super Bowl performance by analysing the differences in an artist's data from before and after the halftime show.

The Wilcoxon signed rank test is reflected in the equation

$$W = \sum_{i=1}^{N_r} [\text{sgn}(x_{2,i} - x_{1,i}) \cdot R_i] \quad (1)$$

where W is the test statistic, N_r is the sample size excluding pairs where $x_1=x_2$, sgn is the sign function, $(x_{2,i} - x_{1,i})$ is the corresponding ranked pairs from the two distributions, and R_i is the rank i (Wilcoxon Signed Rank Test, 2017).

The Wilcoxon signed rank test is based on difference scores. However, unlike a regular sign test, in addition to analysing the signs of the differences, the Wilcoxon

signed rank test also considers the magnitude of the observed differences. To carry out the Wilcoxon signed rank test, one must first compute the difference scores, and then rank them. This is done by ordering the absolute values of the difference scores and then ranking them 1 through n from the smallest to largest absolute values of the difference scores. Finally, positive or negative signs of the observed differences to the corresponding rank are assigned (Wilcoxon Signed Rank Test, 2017).

Hypotheses for the Wilcoxon signed rank test concern the population median of the difference scores. In the case of the null hypothesis, or H_0 , the median difference is zero, or half of the differences are positive and half are negative. The alternative hypothesis, H_1 , states that the median difference is not zero, meaning that there are more than 50% positive or negative differences.

3.1. Data

The data for this study was all obtained from Chatmetric.com. Chartmetric is a platform that provides comprehensive streaming and social data for music industry professionals. The data included for this research regarding the impact of Super Bowl halftime shows on a performer's popularity is compiled from the three most recent years of the NFL's Super Bowl games. This includes the 2020 Super Bowl, the 2021 Super Bowl, and the 2022 Super Bowl. The three most recent halftime performances included a total of 8 artists, and these are the 8 artists that will be included in the study. There were 5 artists performing in the most recent 2022 Super Bowl halftime show: Dr. Dre, Snoop Dogg, Eminem, Mary J. Blige, and Kendrick Lamar. The 2021 Super Bowl halftime show included The Weeknd, as its sole performer. Finally, the 2020 Super Bowl halftime show included two performing artists, Shakira and Jennifer

Lopez. The data on these 8 artists ranges from November 3, 2019 to May 3, 2020 for the 2020 Super Bowl halftime show, November 7, 2020 to May 7, 2021 for the 2021 Super Bowl halftime show, and November 13, 2021 to May 13, 2022 for the 2022 Super Bowl halftime show (Chartmetric, 2021).

The study includes the statistics for each artist's Spotify listeners, YouTube subscribers, Instagram followers, and Spotify followers every day for the three months leading up to their performance, as well as the day of their performance and the three months after the halftime performance has occurred (Chartmetric, 2021). The timeframe is extended to one month before and after and three months before and after the performance as opposed to the timeframe of previous research which included a short-term analysis of the week before and after the halftime performances took place. This allows the study to achieve a long-term analysis of the impact of each artist's halftime show on their careers. It portrays the ways in which their performances can have lasting and beneficial impacts on their careers by fostering fanbase growth and increasing their overall popularity. The one month before and after timeframe as well as the three months before and after timeframe build on previous research allow this study to achieve a bigger picture of the impact of an artist's performance as compared to prior studies conducted on Super Bowl halftime performers.

By analysing the data for each artist's Spotify listeners, YouTube subscribers, Instagram followers, and Spotify followers both before and after the Super Bowl, this study will build even further on the research conducted in previous Super Bowl halftime performance studies. Previous studies have analysed artist's music consumption and sales before and after their halftime shows which may not provide a detailed enough picture of overall fanbase growth and increased popularity. The

statistics for listeners and followers across several different streaming, social media, and video platforms will allow this study to estimate the growth of a halftime performer's overall fanbase and popularity well after their Super Bowl appearance takes place.

3.2. Methodology

The first step taken was to find the averages for each artist's Spotify listeners, YouTube subscribers, Instagram followers, and Spotify followers for the month leading up to the artist's Super Bowl Performance, the day of, and the month after the Super Bowl took place. I compared the means for each artist's Spotify listeners, YouTube subscribers, Instagram followers, and Spotify followers from the month before their halftime show to the month after in order to gain a deeper understanding of the change in each of these statistics for the performers as a result of their Super Bowl performance. This was an extended timeframe as compared to the previous research conducted on the Super Bowl halftime performers, allowing me to understand the long-term effects of the performance on an artist's career.

Next, I decided to further extend the timeframe, conducting the same process and finding means of Spotify listeners, YouTube subscribers, Instagram followers, and Spotify followers for each artist for three months before and after the Super Bowl. This allowed me to compare the artist's mean statistics over an even greater period of time so that I could further understand the long-term impacts of the Super Bowl halftime show on an artist's career.

The next portion of this study employs the use of the Wilcoxon signed rank test in order to further analyse the effects of the Super Bowl's halftime show on an

artist's popularity. I carried out four sign tests for each artist in the study. The first sign test was a comparison of the month before and month after the halftime show for an artist's total followers. The day of the halftime show was included in the after category, assuming that the performance acted as a boost in the artist's fanbase that same day.

$$W = \sum_{i=1}^{29} [\text{sgn} (AF_{After,i} - AF_{Before,i}) \times R_i] \quad (2)$$

Where 29 is the number of observations for the month before and month after, $AF_{After,i}$ represents the artist followers after, and $AF_{Before,i}$ represents artist followers before the Super Bowl.

The second sign test was also a comparison of total followers, but in the three months before and after the Super Bowl.

$$W = \sum_{i=1}^{90} [\text{sgn} (AF_{After,i} - AF_{Before,i}) \times R_i] \quad (3)$$

Where 90 is the number of observations for three months before and after the Super Bowl.

The third sign test for each artist was a comparison of Spotify listeners in the month before and after the halftime show.

$$W = \sum_{i=1}^{29} [\text{sgn} (AL_{After,i} - AL_{Before,i}) \times R_i] \quad (4)$$

Where $AL_{After,i}$ represents the artist's Spotify listeners after the Super Bowl and $AL_{Before,i}$ represents the artist's Spotify listeners before the Super Bowl.

The final sign test was also a comparison of the artists' Spotify listeners, but this test compared the three months before the Super Bowl halftime show to the three months after the show as shown in the equation below.

$$W = \sum_{i=1}^{90} [\text{sgn} (AL_{After,i} - AL_{Before,i}) \times R_i] \quad (5)$$

For the first set of sign tests on each artist's total followers, I needed to find the total follower statistics for each artist across several different platforms. I decided to use one social media platform, one video platform, and one music streaming platform. This led me to look at each artist's Instagram followers, YouTube subscribers, and Spotify followers. By analysing the followers across several different platforms for each artist, a more detailed picture of these artists' overall fanbases could be achieved. In order to calculate each artist's total followers, I found each artist's daily means for combined Instagram followers, YouTube subscribers, and Spotify followers for each day in the three months before and after the Super Bowl.

The null hypothesis for this study is that the median difference in an artist's followers or listeners from before and after the halftime show would be zero. This would mean that half of the differences are positive and half of the differences are negative and that the halftime show may not be effective in terms of increasing an artist's popularity. The alternative hypothesis for this study is that the median difference in an artist's followers or listeners from before and after the halftime show would not be zero. In this case, there would be more than 50% negative differences and the halftime show, meaning that the median of followers/listeners before - the median of followers/listeners after is smaller than 0.

H_0 = the median difference in an artist's followers or listeners before and after the Super Bowl is zero (half the differences are positive and half are negative)

H_1 = the median difference in an artist's followers or listeners before and after the Super Bowl is not zero (there are more than 50% negative differences)

4. Results and Analysis

The first step of the method was to find the before and after means for each artist's total followers and listeners to observe any potential changes in the overall fanbase numbers after the Superbowl. Table 1 below includes the results of the before and after means for each performing artist's total followers and Spotify listeners in the month leading up to the Super Bowl as well as the month after the Super Bowl took place. Each artist's average total followers and Spotify listeners increased from the month preceding the halftime show to the month following their performance. The higher levels for both listeners and followers suggest that the Super Bowl halftime show could be an effective and valuable promotional event for these performing artists.

Table 1: Means 1 Month Before and After Super Bowl				
	Total Followers Before	Total Followers After	Spotify Listeners Before	Spotify Listeners After
2022 Super Bowl				
Dr. Dre	5940135.43	6277864.069	15179401.32	25310943.69
Snoop Dogg	27627255.1	28620647.3	20928653.06	25271076.07
Eminem	45318774.5	46290881.76	46284882.03	53348391.79
Mary J. Blige	3596381.3	3738717.034	8349635.68	10504815.28
Kendrick Lamar	12961342.5	13125421.85	30671232.87	32728557.41
2021 Super Bowl				
The Weeknd	26024131.3	27136425.86	66780471.58	72334596.90
2020 Super Bowl				
Shakira	35332553.8	36692995.22	23972591.16	31168021.10
Jennifer Lopez	43035516.1	44647714.69	13492581.19	14919487.23

Table 2 includes the means for total followers and Spotify listeners from the three months leading up to the Super Bowl and the three months after the Super Bowl took place for each artist. Once again, the three month means from before the Super Bowl were consistently less than the three months after means for each artist. This further suggests that the Super Bowl halftime show could be an effective promotional event for these musicians that can have possible long-term benefits on their careers by increasing fanbase and popularity levels.

Table 2: Means 3 Months Before and After Super Bowl				
	Total Followers Before	Total Followers After	Spotify Listeners Before	Spotify Listeners After
2022 Super Bowl				
Dr. Dre	5817310.87	6449906.13	14471562.23	23022465.83
Snoop Dogg	27213962.91	29274999.32	21156106.32	24399985.28
Eminem	44747204.91	46921972.54	45637336.64	53028252.30
Mary J. Blige	3524804.15	3806143.74	8046039.98	9972757.81
Kendrick Lamar	12865007.83	13273925.45	30366420.40	32509068.86
2021 Super Bowl				
The Weeknd	25045801.26	27872257.59	65415121.82	71275462.53
2020 Super Bowl				
Shakira	35071657.78	37375522.50	22413475.88	30124115.74
Jennifer Lopez	42248803.52	45607294.57	13068787.12	14651874.24

However, after analysing these one month before and after and three months before and after means, there is still a question of the extent to which these impacts of increased fanbase and popularity will last for the future of these artists' careers post Super Bowl halftime show performance. The one month after means for Spotify listeners for many of the performing artists are consistently higher than the three

months after means. This shows that the Spotify listener levels of these artists consistently drops in the three months after the Super Bowl takes place as compared to the month after their halftime show appearance. Means for total followers for these artists did not seem to have the same drop as Spotify listeners from the one month after to three months after the Super Bowl timeframe. This is likely because fans would have to make the conscious decision to unfollow the artist whereas fans are not consciously choosing to stop listening to the artist on Spotify. Instead, they are simply streaming the artists' music over Spotify less as more time passes from the Super Bowl performance. This is what leads to the question of the long-term effects of the halftime show and whether the popularity increase will be a lasting result of an artist's performance.

The second portion of this study employs the use of the Wilcoxon signed rank test in order to further analyse the impact of an artist's halftime performance on their career and overall popularity levels. There were four sign tests conducted for each of the eight artists. Table 3 shows the results of the sign tests for each artist for the total followers in the month before the halftime show compared to the total followers in the month after the show. Table 4 shows the results of the sign tests conducted for the artists' total followers in the three months before and after the halftime show. Table 5 shows the results for each artist's sign test for Spotify listeners in the month before and after the halftime show. Finally, Table 6 shows the results for each artist's sign test for Spotify listeners in the three months before and after the halftime show.

Table 3: 1 Month Followers Sign Test							
Variable	N	Median Before	Median After	median before - median after > 0	median before - median after < 0	median before – median after = 0	p-value
Dr. Dre Followers	29	5949427	6318731	0	29	0	0.000
Snoop Dogg Followers	29	27700000	28700000	0	29	0	0.000
Eminem Followers	29	45300000	46300000	0	29	0	0.000
Mary J. Blige Followers	29	3602363	3747956	0	29	0	0.000
Kendrick Lamar Followers	29	13000000	13100000	0	29	0	0.000
The Weeknd Followers	29	26100000	27200000	0	29	0	0.000
Shakira Followers	30	35400000	36800000	0	30	0	0.000
Jennifer Lopez Followers	30	43100000	44700000	0	30	0	0.000

Table 4: 3 Months Followers Sign Test							
Variable	N	Median Before	Median After	median before - median after > 0	median before - median after < 0	median before - median after = 0	p-value
Dr. Dre Followers	90	5823760	6482643	0	90	0	0.000
Snoop Dogg Followers	90	27200000	29300000	0	90	0	0.000
Eminem Followers	90	44700000	47000000	0	90	0	0.000
Mary J. Blige Followers	90	3525744	3819166	0	90	0	0.000
Kendrick Lamar Followers	90	12900000	13200000	0	90	0	0.000
The Weeknd Followers	90	25000000	27900000	0	90	0	0.000
Shakira Followers	91	35100000	37500000	0	91	0	0.000
Jennifer Lopez Followers	91	42200000	45700000	0	91	0	0.000

Table 5: 1 Month Listeners Sign Test							
Variable	N	Median Before	Median After	median before - median after > 0	median before - median after < 0	median before - median after = 0	p-value
Dr. Dre Listeners	29	15000000	26500000	0	29	0	0.000
Snoop Dogg Listeners	29	20700000	25700000	0	29	0	0.000
Eminem Listeners	29	46200000	54100000	0	29	0	0.000
Mary J. Blige Listeners	29	8320001	10700000	0	29	0	0.000
Kendrick Lamar Listeners	29	30800000	32900000	0	29	0	0.000
The Weeknd Listeners	29	66900000	72600000	0	29	0	0.000
Shakira Listeners	30	23200000	32000000	0	30	0	0.000
Jennifer Lopez Listeners	30	13500000	15200000	3	27	0	0.000

Table 6: 3 Months Listeners Sign Test							
Variable	N	Median Before	Median After	median before - median after > 0	median before - median after < 0	median before - median after = 0	p-value
Dr. Dre Listeners	90	14200000	22100000	0	90	0	0.000
Snoop Dogg Listeners	90	21200000	24100000	0	90	0	0.000
Eminem Listeners	90	45200000	52900000	0	90	0	0.000
Mary J. Blige Listeners	90	8255407	9697091	0	90	0	0.000
Kendrick Lamar Listeners	90	30200000	32400000	0	90	0	0.000
The Weeknd Listeners	90	65800000	70300000	0	90	0	0.000
Shakira Listeners	91	21900000	29900000	0	91	0	0.000
Jennifer Lopez Listeners	91	13000000	14500000	0	91	0	0.000

Each one of these sign tests for total followers and Spotify listeners for each artist in both the month before and after timeframe as well as the three months before and after timeframe resulted in a p-values of 0.000. This p-value of less than 0.05 indicates that the null hypothesis stating that the median difference in an artist's followers or listeners from before and after the halftime show would be zero can be rejected. The p-value of 0.000 indicates that the alternative hypothesis could be correct for both the one month before and after and three months before and after timeframes for total followers and Spotify listeners for each artist. This means that is possible that these artists' halftime show performances were effective promotional events that could have positively impacted their careers by boosting their overall popularity and increasing their fanbase.

The main limitation for this study is that a Wilcoxon signed rank test does not account for other variables that may have an impact on the number of followers and listeners of a Super Bowl halftime performing artist. For instance, an artist may also release an album or song right before or right after their halftime performance takes place. This new release for the artist would most likely also impact the amounts of listeners and followers but would be unaccounted for in a sign test. Similarly, if an artist performed in a separate concert that was very close to the date of their Super Bowl halftime show, then their follower and listener numbers would likely be impacted by this separate performance. Since these variables were unaccounted for in my study, if any of the Super Bowl halftime performers that I examined had song releases, album releases, or concerts that were within my one and three months before and after timeframe, then this would have impacted my results. Future research could use a methodology that is slightly different from a Wilcoxon signed rank test and that could account for these types of extraneous variables.

5. Conclusion

In this thesis, I looked at the effectiveness of the Super Bowl's halftime show for performers' fanbase. Compared to previous research, I employed a longer time frame to analyse potential impacts of the halftime show. I examined Spotify listeners as well as followers across several different platforms including social media, music streaming, and video streaming platforms for the most recent Super Bowl performing artists one month and three months before and after their performances. The results from the mean comparisons as well as the sign tests that were carried out indicated that the Super Bowl's halftime show can be a highly beneficial promotional event that may have lasting effects on a musician's career by increasing the artist's fanbase and overall popularity.

Implications of this study show that future research into this topic is necessary. In order to fully understand the long-term and lasting impacts of a Super Bowl halftime performance on an artist's career, the timeframe could be further extended to 6 months before and after the halftime performance and even one year before and after the halftime show. This would allow for an even greater understanding of the lasting impacts of the Super Bowl halftime show for musicians. It would further examine whether the benefits of an artist's increased fanbase and popularity from a Super Bowl performance can be maintained well into the future of their career.

References

- Chartmetric: A Music Data Analytics Tool With Insights Driven by Data Science. (2021). Chartmetric.com. <https://chartmetric.com/>
- Chartmetric | Dr. Dre, Social and Streaming Stats. (2022). Chartmetric.com. <https://app.chartmetric.com/artist?id=129#socialStats>
- Chartmetric | Eminem, Social and Streaming Stats. (2022). Chartmetric.com. <https://app.chartmetric.com/artist?id=236#socialStats>
- Chartmetric | Jennifer Lopez, Social and Streaming Stats. (2022). Chartmetric.com. <https://app.chartmetric.com/artist?id=177#socialStats>
- Chartmetric | Kendrick Lamar, Social and Streaming Stats. (2022). Chartmetric.com. <https://app.chartmetric.com/artist?id=3768#socialStats>
- Chartmetric | Mary J. Blige, Social and Streaming Stats. (2022). Chartmetric.com. <https://app.chartmetric.com/artist?id=784#socialStats>
- Chartmetric | Shakira, Social and Streaming Stats. (2022). Chartmetric.com. <https://app.chartmetric.com/artist?id=308#socialStats>
- Chartmetric | Snoop Dogg, Social and Streaming Stats. (2022). Chartmetric.com. <https://app.chartmetric.com/artist?id=60>
- Chartmetric | The Weeknd, Social and Streaming Stats. (2022). Chartmetric.com. <https://app.chartmetric.com/artist?id=3852>
- Clark, J. S., Apostolopoulou, A., & Gladden, J. M. (2009). Real women watch football: Gender differences in the consumption of the NFL Super Bowl broadcast. *Journal of Promotion Management*, 15(1-2), 165–183. <https://doi.org/10.1080/10496490902837510>
- Dotterweich, D. P., & Collins, K. S. (2005). The Practicality of Super Bowl Advertising for New Products and Companies. *Journal of Promotion Management*, 11(4), 19–31. https://doi.org/10.1300/J057v11n04_03
- GROZA, M. P. (2015). Advertising Interference: Factors Affecting Attention to Super Bowl Advertisements and Their Effectiveness. *Marketing Management Journal*, 25(2), 123–133.
- Hartmann, W. R., & Klapper, D. (2014). Do Superbowl Ads Affect Brand Share? Working Papers (Faculty) -- Stanford Graduate School of Business, 1–21.
- Kelly, Y.J., Berri, D., Matheson, V.A. (2020). The Performers. In: *The Economics of the Super Bowl*. Palgrave Pivots in Sports Economics. Palgrave Macmillan, Cham. https://doi.org/10.1007/978-3-030-46370-0_5

Reiley, D. H., & Lewis, R. A. (2013). Down-to-the-minute effects of Super Bowl advertising on online search behavior. SSRN Electronic Journal.
<https://doi.org/10.2139/ssrn.2227122>

Smith, A. D., & Smith, A. A. (2008). Exploring the service location strategies behind Super Bowl venue selection. *Services Marketing Quarterly*, 29(4), 66–84.
<https://doi.org/10.1080/15332960802218778>

Wilcoxon Signed Rank Test. (2017). Bu.edu. https://sphweb.bumc.bu.edu/otlt/mph-modules/bs/bs704_nonparametric/BS704_Nonparametric6.html