The Times They Are A-Changin': An Analysis of *Rolling Stone* Magazine's 500 Greatest Songs of All Time

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ABSTRACT

In 2004, *Rolling Stone* magazine published its first list of the "500 Greatest Songs" of all time. Their list was recently revised in 2021. Over half of the song titles in the first list were displaced by hit songs released since 2004 or by hit songs released before 2004 that found new popularity among the magazine's 2021 survey respondents. The authors examine how well hit songs released (i) before 1970, (ii) during the 1970s, (iii) the 1980s, and (iv) the 1990s hold up in the rankings between the two lists. Chi-square tests on contingency tables show that despite the smaller number of hits released before 2000 in the 2021 list, the decade of the song's release is unrelated to ranking. That is, hit songs released in the 1970s are no less popular (as a percentage of all 500 hit songs in the "Top 100") in 2021 than they were in 2004.

Introduction

Rolling Stone magazine periodically surveys selected musicians, producers, critics, journalists, and industry figures to compile a list of "The 500 Greatest Songs of All Time." Their first two lists were published at the end of 2003 (hereafter, the first or 2004 list) and September 2021 (hereafter, the 2021 list). While it is possible that the same songs that appeared in the 2004 list could have also appeared in the 2021 list, the fact is that the 2021 list included not only 50 songs released since 2004 but also 227 hit songs released before 2004 that did not make the first list.

In this short research note, the authors examine how ranking and release date changed from one list to the next for songs that were released prior to the publication of both of these lists. For example, although there were far fewer songs in the 2021 list that were released before 1970 (namely, 135) than there were in the 2004 list (266), were these greatest hits before 1970 ranked discernably lower in the 2021 list than they were in the previous list? In other words, was the percentage of songs released before 1970 ranked in, say, the top 100 in the 2021 list much smaller than the corresponding percentage in the 2004 list? Was the percentage of songs released before 1970 ranked between, say, 401 and 500 in the 2021 list much larger than the corresponding percentage in the 2004 list? These same questions could be asked of the greatest hits released in the 1970s, '80s, and '90s.

Did nostalgia for the golden oldies on vinyl records from the second half of the 20th century enjoy the same popularity on both lists? Or were songs from, say, the 1980s overrepresented in the first list among the highest ranked songs but not in the second list?

The Data

The first *Rolling Stone* magazine list of the "500 Greatest Songs of All Time" was published on December 11, 2003 [1]. The 2021 list was published on September 15, 2021 [2]. For each of the 500 songs on each list, we recorded its rank, the name of the artist(s), the title and the release year. Rankings were grouped into five classes: (i) 1—100, (ii) 101 – 200, (iii) 201 – 300, (iv) 301 – 400, and (v) 401 – 500. The release years were grouped into four classes: (i) before 1970, (ii) the 1970s, (iii) the 1980s, and (iv) the 1990s. Fifty-nine of the top 100 hits on the 2004 list were released before 1970 (and 45 of these 59 hits or more than three-fourths were greatest hits from the 1960s alone). By comparison, only 34 of the top 100 hits on the 2021 list were released before 1970 (and 28 of these 34 hits or more than eighty percent were greatest hits from the 1960s). The earliest hit in the 2004 list was "Rollin' Stone" by Muddy Waters (rank: 327, released in 1948); the earliest hit in the 2021 list was "Cross Road Blues" by Robert Johnson (rank: 481, released in 1937).

The two most represented musical groups in both lists were The Beatles and The Rolling Stones. (Bob Dylan tied The Rolling Stones in the 2021 list.) The Beatles had 23 songs in the 2004 list (excluding the singles "Imagine" by John Lennon and Yoko Ono [rank: 1]; "Maybe I'm Amazed" by Paul McCartney [rank 158]; and "My Sweet Lord" by George Harrison [rank: 321]), but only 12 songs on the 2021 list (again excluding "Imagine" [rank: 19]; neither "Maybe I'm Amazed" nor "My Sweet Lord" appeared in the 2021 list). By comparison, The Rolling Stones had 14 songs in the 2004 list, but only 7 songs in the 2021 list.

Methodology

A contingency table shows how one characteristic depends on another. In the context of *Rolling Stone* magazine's greatest hit songs, we endeavor to show how for songs released during given periods of time, ranking (divided into five classes of 100 songs each) depends on the magazine's two surveys seventeen years apart. To test the null hypothesis of no dependence between the two categorical variables, we use a chi-square test.

Table 1. Observed Frequencies for *Rolling Stone* Magazine's Greatest Hits Released Before 1970, 2004 and 2021 Surveys

	Ranking (j)						
	1 – 100	101 – 200	201 – 300	301 – 400	401 – 500	Total Frequency	P_i = Relative Frequency
List (i)							
2004	59	54	56	49	48	266	.663
2021	34	37	28	20	16	135	.337
Total Frequency	93	91	84	69	64	401	
P_j = Relative Frequency	.232	.227	.209	.172	.160		

For example, Table 1 shows the ranking in one of five groups (1 – 100, 101 – 200, 201 – 300, 301 – 400, and 401 – 500) for all hit songs released before 1970 that appeared in either the 2004 or 2021 list. Let O_{ij} denote the observed frequency in the i^{th} row and j^{th} column. For example, $O_{23} = 28$. Let π_{ij} denote the underlying bivariate probability distribution. For example, π_{23} is the probability that a song released before 1970 in the 2021 list was ranked between 201 and 300. Let π_i and π_j similarly denote the marginal probability distributions. Then the null hypothesis of statistical independence may be stated precisely as:

(1) $$H_0 : \pi_{ij} = \pi_i \pi_j$$

The test statistic is:

(2) $$\chi^2_{calculated} = \sum_i \sum_j \frac{(O_{ij} - E_{ij})^2}{E_{ij}}$$

where $E_{ij} = nP_iP_j$ (and n is the sample size, P_i and P_j are the respective row and column relative frequencies in the contingency table). For example, $E_{23} = 401(.337)(.209) = 28.3$. We have written the Σ sign twice in equation (2) to indicate that we sum over the whole table (i = 2 rows and j = 5 columns). The number of degrees of freedom (d.f.) for this test is d.f. = (i – 1) × (j – 1) = 1 × 4 = 4. Finally, the $\chi^2_{calculated} = 5.175$ can be converted to a *p*-value, here, *p* = *0.270.*

The *p*-value is too high to reject H_0 at the customary 5% level. That is, at this significance level, χ^2 fails to establish any dependence of ranking and the list (that is, the two surveys) for greatest hits released before 1970. Still, in other words, the percentage of greatest hits released before 1970 in the top 100 (or in any other class ranking of 100 songs) was the *same* in both surveys.

Results

Table 2 shows the observed frequencies for *Rolling Stone* magazine's greatest hits released in the 1970s, '80s, and '90s. For all three different periods, the *p*-values were, respectively, 0.654, 0.857, and 0.732. That is, although there were fewer songs from the 1970s, '80s, and '90s that appeared in the more recent list (relative to the 2004 list), the percentage of oldies in each ranking category was surprisingly about the same on both lists.

Although fewer hits by The Beatles and The Rolling Stones appear in the 2021 list than in the 2004 list (12 *vs.* 23 for The Beatles, 7 *vs.* 14 for The Rolling Stones), Table 3 shows that their popularity endures. The percentage of their hits that broke into the top 200 in the 2021 list was significantly greater than it was in the 2004 list (*p* = 0.029). The three biggest climbers for The Beatles were "Strawberry Fields Forever" (ranked 146 in 2004; ranked 7 in 2021); "Eleanor Rigby" (350 in 2004; 243 in 2021); and "Penny Lane" (314 in 2004; 280 in 2021). The four biggest climbers for The Rolling Stones were "Gimme Shelter" (499 in 2004; 13 in 2021); "Tumbling Dice" (280 in 2004; 86 in 2021); "Paint It, Black" (399 in 2004; 213 in 2021); and "Jumpin' Jack Flash" (319 in 2004; 144 in 2021).

Table 2. Observed Frequencies for *Rolling Stone* Magazine's Greatest Hits Released in the 1970s, '80s, and '90s.

	Ranking				
	1 – 100	101 – 200	201 – 300	301 – 400	401 – 500
Released in the 1970s					
2004 list	27	30	28	30	16
2021 list	23	27	35	36	23
				$\chi^2_{calculated}$ = 2.449,	p = 0.654
Released in the 1980s					
2004 list	9	11	11	13	11
2021 list	14	16	17	13	20
				$\chi^2_{calculated}$ = 1.327,	p = 0.857
Released in the 1990s					
2004 list	4	4	5	6	3
2021 list	8	12	15	16	19
				$\chi^2_{calculated}$ = 2.022,	p = 0.732

Table 3. Observed Frequencies for *Rolling Stone* Magazine's Greatest Hits by The Beatles and The Rolling Stones

	Ranking		
	1 – 200	201 – 500	
2004 list	18	19	
2021 list	15	4	
		$\chi^2_{calculated}$ = 4.762,	p = 0.029

Concluding Remarks

Rolling Stone magazine surveyed notables in the music industry at the end of 2003 and again in 2021 to compile a list of the 500 greatest songs of all time. The 2021 list displaced 277 songs from the first list. The new hit songs had either not been released before 2004 or they had found new popularity among survey respondents in 2021.

The analysis presented here shows that despite their smaller numbers in the 2021 list, the percentage of songs released before 1970 or in the 1970s, '80s, or '90s across rankings in groups of one hundred each remained surprisingly the *same* from one list to the next. Songs by
The Beatles and The Rolling Stones (the two groups with the most hits in the 2004 list) that re-appeared in the 2021 list were ranked significantly higher in the updated list.

Future analysis of the greatest hits from one list to another could examine songs not by decade of release but by genres (for example, hard rock, country, hip hop, and rap) or songs by musical groups or by solo artists (or by gender of each artist). And, in lieu of using a poll of industry figures to rank the greatest songs, one could use Spotify stream counts.

References

1. Rolling Stone. (2003, December 11). "The 500 Greatest Songs of all Time (2004)." *Rolling Stone* magazine at https://www.rollingstone.com/music/music-lists/500-greatest-songs-of-all-time-151127/.

2. Rolling Stone. (2021, September 15). "The 500 Greatest Songs of All Time." *Rolling Stone* magazine at https://www.rollingstone.com/music/music-lists/best-songs-of-all-time-1224767/.