

Measuring Melodic Chromaticism in The Beatles

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Introduction

The project that I have undertaken for this class fits into a larger area of personal research interest, which is the evolution of musical intricacies - i.e. chromaticism, mode mixture, harmonic color, etc. - in rock n' roll music in the 1960s and 1970s. I am interested in researching and understanding the broader story of how rock n' roll evolved in this manner, where certain compositional procedures originated, and where potential influences were taken from. In doing so, I would hope to gain some concrete knowledge on what songwriters/groups were the most significant in advancing the tonal language of rock music during this time, and how the stylistic origins transformed into having multiple different branches of influences and new styles. For a study like this, it should be no surprise that a group such as The Beatles would be at the forefront. The Beatles are highly regarded as one of the most influential bands of all time, coming in at the height of the British Invasion and taking the world by storm with their unique rock n' roll sound. Of course, they also played a pivotal role in bridging the two decades of the 1960s and 1970s, connecting the origins of rock n' roll to a new era of expansive songwriting techniques and capabilities.

For this particular project, in order to provide a reasonable scope, I have chosen to complete a corpus study that focuses solely on the Beatles and their use of chromaticism. Specifically, this study measures the amount of melodic chromaticism in the music of the Beatles over their career. Using the musical element of melody to measure chromaticism was a decision made based on not only the intriguing question it poses, but also with consideration for the

analytical tools being used and how to effectively answer a question given my expertise level and allotted time frame. The central question posed by this project is thus: how much melodic chromaticism exists within the music of the Beatles? From there, several secondary questions are raised, such as if/how the use of melodic chromaticism changed over time, how this phenomenon was dispersed among each individual album, and where/when this phenomenon may have originated from. The data gathered from this study may then be used to help further studies on chromaticism within this style and era, and additional questions outside of the scope of this project can be posited as to how the Beatles may have influenced others in this regard, who influenced them in their songwriting, and if this framework of using chromaticism to this extent was unique to them or already part of the broader stylistic schemes.

One scholar who has already done work on chromaticism in the music of the Beatles is Naphtali Wagner. Wagner has published several studies on how the Beatles use chromaticism in their melodies as a broad observance of their style. One such study is from 2003 called “The “Domestication” of Blue Notes in the Beatles' Songs”,¹ which discussed several different ways in which the Beatles treated “blue notes”, a term borrowed from the Blues style broadly defined as melodic notes that do not fit within their given harmonic context. Wagner makes a connection with the general Blues influence on the early work of the Beatles, and creates Schenkerian-style reductions of several Beatles songs to illustrate the different uses of structural blue notes in the melody. This comes with the author’s proposed explanations for why these notes may have been used where they were, given other surrounding contexts such as lyrical meaning and broader chord relationships.

The other study by Wagner that is highly relevant to this project is the 2004 study “Fixing a Hole in the Scale: Suppressed Notes in the Beatles' Songs”.² Here, Wagner measures the use of melodic scale degrees that fall outside of the pentatonic scale in the Beatles' music. Using the blues pentatonic scale ($^1-^3-^4-^5-^7$) as a point of reference, Wagner analyzes the specific uses of scale degrees 2 and 6 and their common tendency to be “suppressed” in the main melodic line, being delayed in their entrance and used in particular moments of climax. Voice-leading reduction graphs of several specific songs are again used, and the study focuses on the different tendencies of each songwriter within the group regarding the use of these suppressed scale degrees.

It is important to mention that neither of these studies were corpus studies, and they had no actual statistical evidence across the board to portray these phenomena in any sort of large sample. These appear to be merely observations made about a few unique melodic tendencies in some music by the Beatles, and although thoroughly analyzed in a few examples, a larger sample size would be needed if any claims are to be made about the actual definition and development of the Beatles's style. This project that I am proposing aims to continue and confirm these studies in a way by expanding the corpus to the entirety of the Beatles' discography. Though the question that I am proposing is not the exact same as either of the two studies by Wagner, its results could still certainly be connected and comparable to the findings from both studies.

Methodology

The corpus for this project consists of all 12 principal studio albums recorded by the Beatles, and includes 173 of the 178 songs released across these albums. Five songs were unable

to be included, all coming from their 10th studio album *The White Album*; these songs are “Glass Onion”, “Martha My Dear”, “Rocky Raccoon”, “Everybody’s Got Something To Hide Except Me and My Monkey”, and “Revolution 9”. The songs are not part of the corpus because their melody lines were not included in the midi files from the midi repository I worked from (and, in the case of “Revolution 9”, the song is an example of *musique concrete* that uses tape loops and electroacoustic procedures without a true melody, so it wouldn’t have been considered for this corpus anyway). Every other album is included in full in this corpus. The repository that I pulled midi files from to use in this study was available from midiworld.com, which luckily enough had most every Beatles song ever written available in midi format. I was able to download these files and create a local corpus that could be used by music21.

This study takes a rather straightforward approach to measuring melodic chromaticism throughout the corpus. The python code executes a command that loops through the melody line in each song of the corpus one by one and separates each note into two categories, diatonic or chromatic, based on the key that each piece is in. The scales that were used in determining the song’s diatonic notes were based on standard major (Ionian) and minor (harmonic) scales only, meaning that notes within the blues scale, such as b3 and b7, could be considered chromatic and outside of the song’s key. The code returns a .csv file with data on each song’s melodic diatonic notes, melodic chromatic notes, and the percentage of melodic chromaticism in each song, sorted by album chronology and then song order within each album.

In order for this code to work, I had to take several steps in my process of encoding the midi files to ensure all the information could be read correctly. While the midi files themselves were largely clean and error-free (compared to repositories of other groups that I found), there

was still quite a bit of work to be done on them. I first had to make sure that each melody part in the score had the exact same label for every song; in this case, I chose to call it “Melody”. I then had to go through and make sure the melody line was monophonic, using one note at a time without any additional harmonies. Many midi files that I encountered had transcribed vocal harmonies on the same part as the vocal melody, which wasn’t ideal for the purposes of this project since the added notes would have contributed to inflated statistics regarding element of chromaticism in the melody alone. Some decisions were straightforward as for what line to consider as the true melody of piece, but others were more ambiguous due to the several songs having rather tight-knit vocal harmonies where there is not one conclusive melodic line. In those cases, I used my best judgement as a musician and someone familiar with the repertoire to determine what the melody line was. Then, perhaps the most important step I had to take was to make sure each song contained the correct key signature that accurately reflected the song’s key. Notation software is able to carry key metadata that is attached to a specific key signature, and this metadata is ultimately what music21 uses to determine the scale to use as the diatonic scale in each song. Even if the song was in G major and the midi file came with having one sharp, I still had to make sure that this was the key signature tagged with G Major as the key, and not E Minor. This proved to cause me the most difficulties in executing my code, but I was eventually able to get everything to work properly.

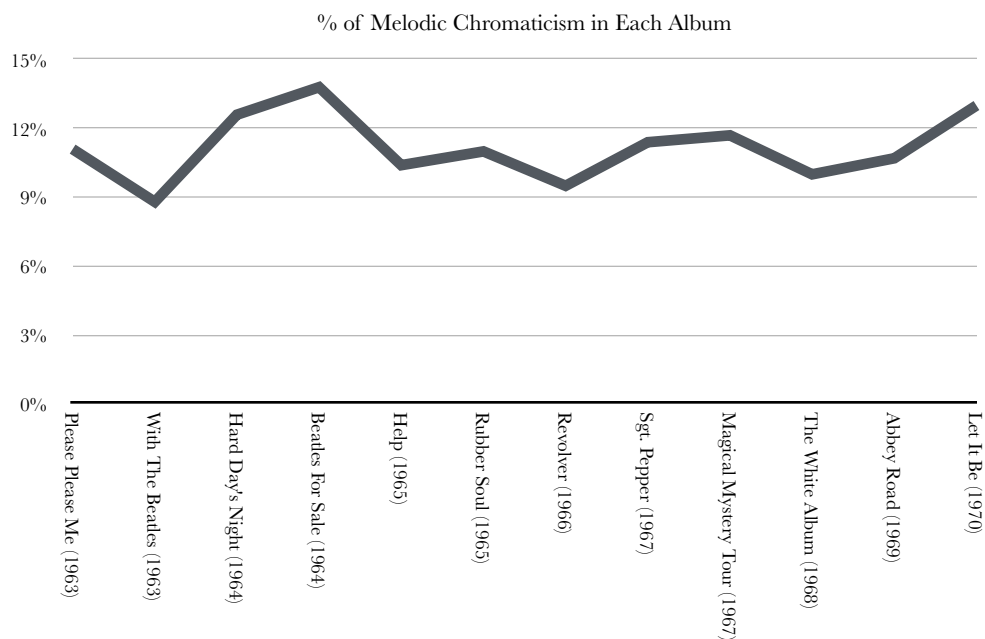
Results

As mentioned earlier, the initial results from running the code imported the data into a .csv file, which I exported as an excel spreadsheet. I have included this spreadsheet in

Appendix A. Appendix B shows 12 separate bar graphs, one for each album, that display the percentage of melodic chromaticism found in each song. Below is a breakdown of the amount of melodic chromaticism by album:

Album	Diatonic Notes in Melody	Chromatic Notes in Melody	%
Please Please Me (1963)	2586	286	11.1%
With The Beatles (1963)	3033	266	8.8%
Hard Day's Night (1964)	2751	346	12.6%
Beatles For Sale (1964)	2579	355	13.8%
Help (1965)	2983	310	10.4%
Rubber Soul (1965)	2939	323	11%
Revolver (1966)	2358	223	9.5%
Sgt. Pepper (1967)	2870	328	11.4%
Magical Mystery Tour (1967)	2667	313	11.7%
The White Album (1968)	5196	520	10%
Abbey Road (1969)	2841	304	10.7%
Let It Be (1970)	2360	307	13%

Here is the same data represented as a line graph:



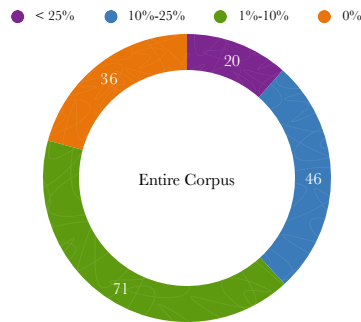
With this particular study, I am not merely concerned about counting the number of chromatic scale degrees, as such a statistic by itself is not particularly revealing. Therefore, another way I have decided to break apart and visualize the data is by categories of how much melodic chromaticism exists in each song. By dividing songs into categories depending on their percentage of melodic chromaticism, we can focus on the particular balance between diatonic and non-diatonic melodic pitches. It may be that some songs are rather stagnant in their usage of melodic chromaticism in that they either never use it or use it consistently. In contrast, some songs may use melodic chromaticism in more exceptional cases, so as to not oversaturate the melody with notes from outside of the key but rather using them sparingly in musically opportune times. The four categories of melodic chromaticism usage that I have determined are: >25%, 10%-25%, 1%-10%, and 0%.

If a song has >25% of its melodic pitches coming from outside of the key, it can be surmised that this use of melodic chromaticism is *structural*, meaning that the melody uses chromatic notes as its fundamental basis rather than as some sort of decoration, a prominent example being the use of the blues scale in the melody over an otherwise major key in the instrumentals.

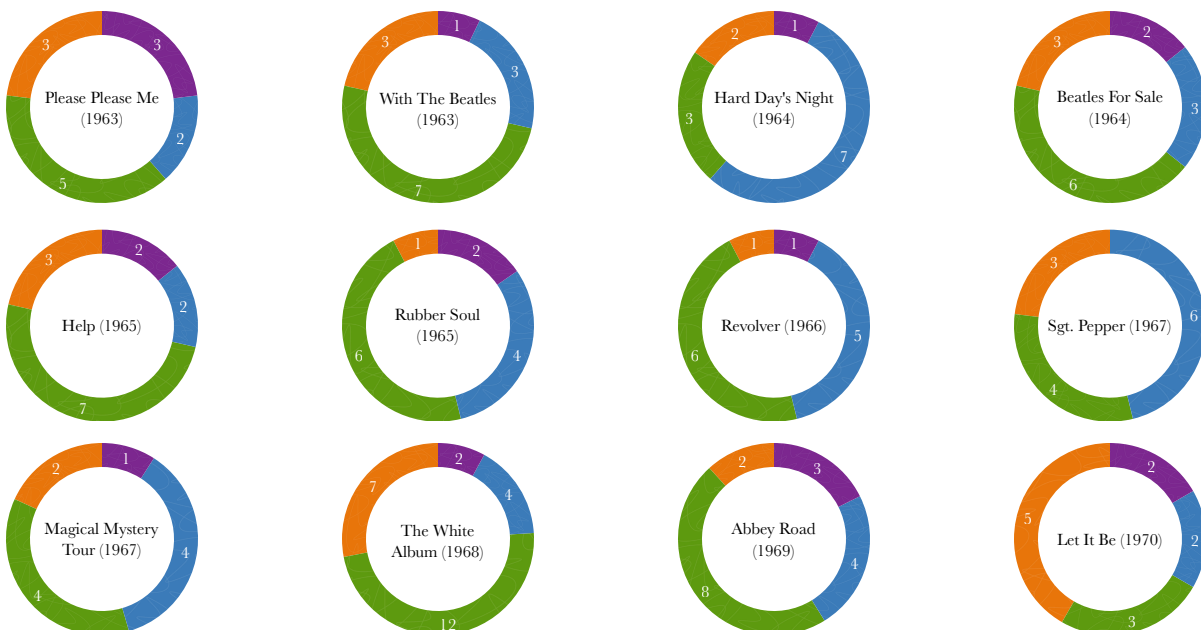
If a song uses chromaticism in its melody between 10%-25% of the time, I consider that to be an element of *novelty*, meaning that chromaticism is not necessarily a foundational part of the melody yet is used enough to provide a conscious amount of separation with the initial diatonic scale, making it a compositional tool that potentially invokes a sustained amount of surprise, curiosity, or a shift in tonal direction (i.e. modulation).

A song that uses melodic chromaticism between 1%-10% of the time is operating at the level of standard *decoration* for this particular tactic. Although not fully proven, I surmise that this is the default level for such a compositional tactic, as melodic chromaticism, if used, is typically used sparingly to provide an instance of color without deviating too far from the tonal center. It may still invoke feelings of surprise and curiosity, but perhaps not at a conscious level or any significant level of sustain.

Below is a breakdown of each of these four categories within the full corpus, the numbers indicating the amount of songs that belong to the particular category:

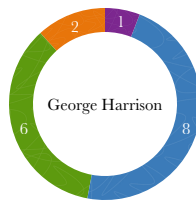
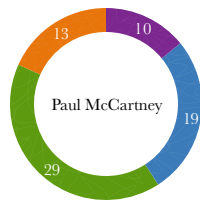
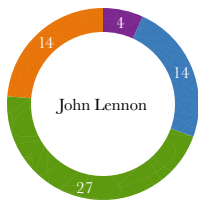


Below is a breakdown of the four categories by album:



As an added point of interest, I also measured the data based on songwriter, to see if any statistical correlations can be made regarding how each songwriter within the group tended to use melodic chromaticism. A table showing percentage data by each songwriter, as well as their songs divided into the four categories, are shown below:

Songwriter	Diatonic Notes in Melody	Chromatic Notes in Melody	%
Lennon	12960	1040	8
McCartney	14051	1735	12.3
Harrison	2765	339	12.3
Starr	1316	31	2.3
Other	4071	746	18.3



Conclusions

The results from the data show a mix of anticipated outcomes and surprising anomalies, as well as a potential narrative for how the Beatles's use of melodic chromaticism evolved over time. Having read Wagner's previous work, I had expected that earlier Beatles music would consist of a noticeably high amount of melodic chromaticism, considering their common implementation of "blue notes" and the blues scale that they were influenced by from the past generation. Then, as their blues influence died out, which from historical anecdote and personal experience seems to have been around 1965 with their release of *Help!*, melodic chromaticism

would not be used to that same extent. Their data mostly confirms this; the first, third and fourth albums each have a noticeably higher rate of melodic chromaticism than the rest of their discography, and beginning with *Help!* the percentage rate takes a notable decline.

However, the second album, *With the Beatles* (1963), actually contains the least amount of melodic chromaticism percentage-wise across all albums, which goes against the hypothesis that earlier Beatles music was consistently more melodically chromatic. In looking closer at the data, I noticed that of the seven songs in the >25% category (the songs that contained the most melodic chromaticism) within the first four albums, four of them were cover songs which had been written several years before and made use of the blues scale. While the song “Roll Over Beethoven” from *With the Beatles*, a Chuck Berry original, contained 30.5% of chromatic notes within its melody, no other song on the album contained more than 14%. In just looking at the original Beatles songs at this time, they used considerably less melodic chromaticism than the covers. This trend continued into the fifth album *Help!*, the last album of theirs with any covers, where the cover song “Dizzy Miss Lizzy” contained significantly more melodic chromaticism (31.4%) than all but one song. This, to me, shows that the Beatles were paying homage to their influences early on by covering songs that used the blues scale conventionally, and though some of their original songs followed suit with similar implementation of structural chromaticism, most of their early original work was not very melodically chromatic.

Though *Help!* signaled a step towards a more unique, personalized sound for the group by many accounts (this study included), the data here also reveals an earlier potential departure point in their career as evidenced by their use of melodic chromaticism, coming from their release of *A Hard Day's Night* a year prior. *A Hard Day's Night*, the band's third studio album, is

the first one to include all original songs, and also contains a majority of songs in the “novelty” category - songs that use between 10%-25% of chromaticism in their melodies, having the most out of any album in their discography with seven songs in that category. This particular proportion of melodic chromaticism usage serves as a precursor to the Beatles’s later albums; from *Rubber Soul* (1965) to *Abbey Road* (1969), each album had at least four songs in this 10%-25% category, whereas no previous album aside from *A Hard Day’s Night* had more than three. Also, from *Rubber Soul* (1965), to *Magical Mystery Tour* (1967), albums 6-9 in their discography, the “novelty” category made up at least 1/3 of the album’s songs. There is a case to be made that *A Hard Day’s Night* separates itself from the other early Beatles albums through this particular proportion of melodic chromaticism, foreshadowing the group’s more mature songwriting style that was to come.

The last album, *Let It Be* (1970), jumps back up to 13% melodic chromaticism usage overall, reverting back to the percentages found in their early albums and is the second-most melodically chromatic album. Interestingly enough, it is also the only album where 0% melodic chromaticism is the largest category. This is a signifier that *Let It Be* was a sort of return to the group’s roots, having clear early blues-influenced songs such as “One After 909” with a staggering 53.2% melodic chromaticism, the most of any in their discography, as well as several songs staying fully melodically diatonic, similar to how their early original work contained little melodic chromaticism as a whole.

Compare that to *Revolver* (1966), the second-least melodically chromatic album at just 9.5% overall, which has only one song with 0% melodic chromaticism. Indeed, the six albums spanning from *Rubber Soul* (1965) to *Abbey Road* (1969), while not as melodically chromatic by

average, still only had a small proportion of their songs not using some sort of chromaticism in their melodies. To me, this data reveals an interesting aspect of the evolution of melodic chromaticism in the music of the Beatles, and is perhaps the most significant finding of the study: it was not so much a notable increase or decrease in the overall average usage of melodic chromaticism overtime that defines its evolution as a tactic, but rather *how* it was used and to what degree. The Beatles began with using melodic chromaticism as either a very structural element to their music, or did not include much chromaticism at all. Over the course of their career, they stopped using melodic chromaticism as a structural feature, and it instead became a more consequential novelty feature that had more of a presence in their music, coming to be a more common and perhaps noticeable feature within their songwriting.

For further research into this topic, a future study may include statistics on the frequency of each actual scale degree, which may help to further understand the different scales, “blue” notes, and modulation/tonicization tactics that The Beatles may have used, giving more definitive answers as to why such evolution took place. One may also expand this to study harmonic language, which is an interest of mine for the future. While focusing on a single line helped me conceptualize and complete this study with my given tools, a more robust project taking a multitude of lines into account would give many more interesting answers to the evolution of chromaticism and songwriting practice in general. Lastly, such a study may be repeated for different corpora, taking discographies of other groups into account and measuring how they are similar and how they differ, which gets closer to the large question at hand of the evolution of chromaticism within these decades of rock n’ roll music.

Works Cited

[1] Wagner, Naphtali. "'Domestication' of Blue Notes in the Beatles' Songs." *Music Theory Spectrum* 25, no. 2 (2003): 353–65.

[2] Wagner, Naphtali. "Fixing a Hole in the Scale: Suppressed Notes in the Beatles' Songs." *Popular Music* 23, no. 3 (2004): 257–69.

Appendix A

Album	Song	D	C	%
001 Please Please Me	I Saw Her Standing There	172	57	24.9
001 Please Please Me	Misery	263	0	0.0
001 Please Please Me	Anna (Go To Him)	172	65	27.4
001 Please Please Me	Chains	280	12	4.1
001 Please Please Me	Boys	180	36	16.7
001 Please Please Me	Ask Me Why	234	9	3.7
001 Please Please Me	Please Please Me	169	2	1.2
001 Please Please Me	Love Me Do	134	49	26.8
001 Please Please Me	Baby It's You	252	0	0.0
001 Please Please Me	Do You Want to Know a Secret	232	15	6.1
001 Please Please Me	A Taste Of Honey	149	15	9.1
001 Please Please Me	There's A Place	153	0	0.0
001 Please Please Me	Twist and Shout	196	26	11.7
002 With The Beatles	It Won't Be Long	219	34	13.4
002 With The Beatles	All I've Got To Do	271	0	0.0
002 With The Beatles	All My Loving	202	2	1.0
002 With The Beatles	Don't Bother Me	148	9	5.7
002 With The Beatles	Little Child	204	0	0.0
002 With The Beatles	Till There Was You	155	8	4.9
002 With The Beatles	Please Mister Postman	275	2	0.7
002 With The Beatles	Roll Over Beethoven	244	107	30.5
002 With The Beatles	Hold Me Tight	148	14	8.6
002 With The Beatles	You Really Got a Hold On Me	234	9	3.7
002 With The Beatles	I Wanna Be Your Man	242	29	10.7
002 With The Beatles	Devil In Her Heart	291	30	9.3
002 With The Beatles	Not a Second Time	219	0	0.0
002 With The Beatles	Money	181	22	10.8
003 Hard Day's Night	A Hard Day's Night	266	40	13.1
003 Hard Day's Night	I Should Have Known Better	204	0	0.0

003 Hard Day's Night	If I Fell	151	29	16.1
003 Hard Day's Night	I'm Happy Just to Dance With You	201	1	0.5
003 Hard Day's Night	And I Love Her	108	21	16.3
003 Hard Day's Night	Tell Me Why	243	7	2.8
003 Hard Day's Night	Can't Buy Me Love	207	40	16.2
003 Hard Day's Night	Any Time at All	313	14	4.3
003 Hard Day's Night	I'll Cry Instead	216	57	20.9
003 Hard Day's Night	Things We Said Today	214	36	14.4
003 Hard Day's Night	When I Get Home	204	25	10.9
003 Hard Day's Night	You Can't Do That	267	22	7.6
003 Hard Day's Night	I'll Be Back	157	54	25.6
004 Beatles For Sale	No Reply	206	3	1.4
004 Beatles For Sale	I'm a Loser	220	6	2.7
004 Beatles For Sale	Baby's in Black	187	0	0.0
004 Beatles For Sale	Rock and Roll Music	279	128	31.4
004 Beatles For Sale	I'll Follow the Sun	151	4	2.6
004 Beatles For Sale	Mr. Moonlight	176	17	8.8
004 Beatles For Sale	Kansas City/Hey-Hey-Hey-Hey	154	93	37.7
004 Beatles For Sale	Eight Days A Week	236	0	0.0
004 Beatles For Sale	Words of Love	117	0	0.0
004 Beatles For Sale	Honey Don't	180	55	23.4
004 Beatles For Sale	Every Little Thing	204	4	1.9
004 Beatles For Sale	I Don't Want to Spoil the Party	234	4	1.7
004 Beatles For Sale	What You're Doing	110	19	14.7
004 Beatles For Sale	Everybody's Trying To Be My Baby	125	22	15.0
005 Help	Help!	313	1	0.3
005 Help	The Night Before	213	43	16.8
005 Help	You've Got to Hide Your Love Away	166	0	0.0
005 Help	I Need You	216	9	4.0
005 Help	Another Girl	155	97	38.5
005 Help	You're Going to Lose That Girl	154	3	1.9

005 Help	Ticket to Ride	318	36	10.2
005 Help	Act Naturally	250	16	6.0
005 Help	It's Only Love	142	4	2.7
005 Help	You Like Me Too Much	241	6	2.4
005 Help	Tell Me What You See	201	4	2.0
005 Help	I've Just Seen a Face	270	0	0.0
005 Help	Yesterday	163	8	4.7
005 Help	Dizzy Miss Lizzy	181	83	31.4
006 Rubber Soul	Drive My Car	220	88	28.6
006 Rubber Soul	Norwegian Wood	106	30	22.1
006 Rubber Soul	You Won't See Me	236	8	3.3
006 Rubber Soul	Nowhere Man	260	3	1.1
006 Rubber Soul	Think For Yourself	183	40	17.9
006 Rubber Soul	The Word	234	27	10.3
006 Rubber Soul	Michelle	142	58	29.0
006 Rubber Soul	What Goes On?	231	3	1.3
006 Rubber Soul	Girl	247	12	4.6
006 Rubber Soul	I'm Looking Through You	206	11	5.1
006 Rubber Soul	In My Life	202	12	5.6
006 Rubber Soul	Wait	232	10	4.1
006 Rubber Soul	If I Needed Someone	143	21	12.8
006 Rubber Soul	Run For Your Life	297	0	0.0
007 Revolver	Taxman	161	2	1.2
007 Revolver	Eleanor Rigby	245	12	4.7
007 Revolver	I'm Only Sleeping	223	8	3.5
007 Revolver	Love You To	102	34	25.0
007 Revolver	Here There and Everywhere	183	20	9.9
007 Revolver	Yellow Submarine	181	0	0.0
007 Revolver	She Said She Said	163	18	9.9
007 Revolver	Good Day Sunshine	138	26	15.9
007 Revolver	And Your Bird Can Sing	133	2	1.5

007 Revolver	For No One	198	17	7.9
007 Revolver	Doctor Robert	188	40	17.5
007 Revolver	Got to Get You Into My Life	296	26	8.1
007 Revolver	Tomorrow Never Knows	147	18	10.9
008 Sgt Pepper's Lonely Hearts Club Band	Sgt. Pepper's Lonely Hearts Club Band	170	51	23.1
008 Sgt Pepper's Lonely Hearts Club Band	With a Little Help from My Friends	273	0	0.0
008 Sgt Pepper's Lonely Hearts Club Band	Lucy in the Sky with Diamonds	169	42	19.9
008 Sgt Pepper's Lonely Hearts Club Band	Getting Better	338	0	0.0
008 Sgt Pepper's Lonely Hearts Club Band	Fixing a Hole	187	54	22.4
008 Sgt Pepper's Lonely Hearts Club Band	She's Leaving Home	222	4	1.8
008 Sgt Pepper's Lonely Hearts Club Band	Being for the Benefit of Mr. Kite	166	43	20.6
008 Sgt Pepper's Lonely Hearts Club Band	Within You Without You	186	38	17.0
008 Sgt Pepper's Lonely Hearts Club Band	When I'm Sixty-Four	220	18	7.6
008 Sgt Pepper's Lonely Hearts Club Band	Lovely Rita	310	45	12.7
008 Sgt Pepper's Lonely Hearts Club Band	Good Morning Good Morning	227	0	0.0
008 Sgt Pepper's Lonely Hearts Club Band	Sgt. Pepper's Lonely Hearts Club Band (Rep	116	3	2.5
008 Sgt Pepper's Lonely Hearts Club Band	A Day in the Life	286	30	9.5
009 Magical Mystery Tour	Magical Mystery Tour	184	86	31.9
009 Magical Mystery Tour	The Fool on the Hill	269	31	10.3
009 Magical Mystery Tour	Flying	27	0	0.0
009 Magical Mystery Tour	Blue Jay Way	175	54	23.6
009 Magical Mystery Tour	Your Mother Should Know	231	9	3.8
009 Magical Mystery Tour	I Am the Walrus	212	52	19.7
009 Magical Mystery Tour	Hello Goodbye	296	15	4.8
009 Magical Mystery Tour	Strawberry Fields Forever	236	19	7.5
009 Magical Mystery Tour	Penny Lane	224	39	14.8
009 Magical Mystery Tour	Baby You're A Rich Man	340	0	0.0
009 Magical Mystery Tour	All You Need Is Love	473	8	1.7
010 The White Album	Back in the U.S.S.R	300	22	6.8
010 The White Album	Dear Prudence	200	0	0.0
010 The White Album	Ob-La-Di Ob-La-Da	383	0	0.0

010 The White Album	Wild Honey Pie	28	1	3.4
010 The White Album	The Continuing Story of Bungalow Bill	275	28	9.2
010 The White Album	While My Guitar Gently Weeps	167	34	16.9
010 The White Album	Happiness is a Warm Gun	228	9	3.8
010 The White Album	I'm So Tired	265	2	0.7
010 The White Album	Blackbird	190	12	5.9
010 The White Album	Piggies	131	9	6.4
010 The White Album	Don't Pass Me By	285	18	5.9
010 The White Album	Why Don't We Do It In the Road	151	42	21.8
010 The White Album	I Will	148	0	0.0
010 The White Album	Julia	158	11	6.5
010 The White Album	Birthday	84	62	42.5
010 The White Album	Yer Blues	260	4	1.5
010 The White Album	Mother Nature's Son	170	1	0.6
010 The White Album	Sexy Sadie	275	6	2.1
010 The White Album	Helter Skelter	209	150	41.8
010 The White Album	Long Long Long	93	0	0.0
010 The White Album	Revolution 1	315	10	3.1
010 The White Album	Honey Pie	247	33	11.8
010 The White Album	Savoy Truffle	214	34	13.7
010 The White Album	Cry Baby Cry	311	32	9.3
010 The White Album	Good Night	109	0	0.0
011 Abbey Road	Come Together	267	12	4.3
011 Abbey Road	Something	136	32	19.0
011 Abbey Road	Maxwell's Silver Hammer	293	21	6.7
011 Abbey Road	Oh! Darling	246	25	9.2
011 Abbey Road	Octopus's Garden	237	0	0.0
011 Abbey Road	I Want You (She's So Heavy)	232	19	7.6
011 Abbey Road	Here Comes the Sun	202	5	2.4
011 Abbey Road	Because	95	14	12.8
011 Abbey Road	You Never Give Me Your Money	445	18	3.9

011 Abbey Road	Sun King	63	19	23.2
011 Abbey Road	Mean Mr. Mustard	79	39	33.1
011 Abbey Road	Polythene Pam	57	34	37.4
011 Abbey Road	She Came In Through the Bathroom Window	145	35	19.4
011 Abbey Road	Golden Slumbers	114	0	0.0
011 Abbey Road	Carry That Weight	91	1	1.1
011 Abbey Road	The End	59	23	28.0
011 Abbey Road	Her Majesty	80	7	8.0
012 Let It Be	Two of Us	214	8	3.6
012 Let It Be	Dig a Pony	308	24	7.2
012 Let It Be	Across the Universe	338	0	0.0
012 Let It Be	I Me Mine	191	0	0.0
012 Let It Be	Dig It	83	0	0.0
012 Let It Be	Let It Be	351	0	0.0
012 Let It Be	Maggie Mae	72	0	0.0
012 Let It Be	I've Got a Feeling	272	32	10.5
012 Let It Be	One After 909	118	134	53.2
012 Let It Be	The Long and Winding Road	170	4	2.3
012 Let It Be	For You Blue	76	12	13.6
012 Let It Be	Get Back	167	93	35.8

Appendix B

