

Usage of Music within Commercial Marketing

By Gavin Gu

AUTHOR BIO

My name is Gavin and I am currently studying at Upper Canada College. At UCC, I have developed a strong interest in marketing and music, both of which have significantly shaped my academic journey. I am a motivated and determined individual seeking to learn more about the financial and marketing space.

ABSTRACT

The usage of digital commercial marketing has surged in the past decade, transforming how brands engage with consumers. This paper investigates the psychological and musical elements of digital marketing, focusing on how background music influences consumer perception and purchasing behaviour. Specifically, it examines the impact of musical characteristics such as key signature, chord quality, time signature, and motif structure on emotional response and purchasing decisions. By analyzing the top 50 most successful advertisements and reviewing existing literature, the study identifies a strong positive correlation between the use of major key signatures and increased consumer engagement. Statistical tools, including the Chi-Squared test and Binomial PDF, were applied to quantify the strength of association between musical features and advertising motifs. Results suggest that major keys—particularly D, C, and G major—are overwhelmingly preferred, often paired with piano-based or rhythmically driven compositions that evoke positive emotions. These musical strategies align with consumer behaviour theories that link emotional arousal with impulse buying tendencies. The findings provide empirical support for the strategic use of uplifting, melodic music in commercial campaigns. Overall, this research offers actionable insights for marketers and composers, demonstrating how carefully crafted sound design can significantly enhance the psychological impact and effectiveness of digital advertisements.

Key Word: *Digital Marketing, Advertising Music, Consumer Behaviour, Neuromarketing, Music Psychology*

INTRODUCTION

In 1926, the cereal brand, “Wheaties” created the world’s first audio commercial, meant to be played on the radio as a method of advertisement not previously adopted. The method has seen significant success and has attracted many brands during that time period to adopt new forms of advertisement. (A Brief History of Audio Marketing | Audiodraft, 2016) Studies demonstrated a correlation between stochastic and periodic music to brain activities best resembling engagement (Ellison et al., 2015). Therefore, it is within reason to presume a relationship between consumer actions and the music being played in the background of commercials.

Different from Great Apes, homo sapiens developed brains which contain a larger allocation dedicated to processing auditory information in comparison with other primates (Trimble & Hesdorffer, 2017). Due to the advanced development in the auditory cortex, humans are often more reactive to melodic and rhythmic patterns, often leading to heightened levels of brain activity, (Porges & Rossetti, 2018) for example, pieces with large quantities of major chords often provoke the feeling of happiness, and pieces riddled with minor chords are more likely to bring negative emotions. (Trimble & Hesdorffer, 2017) Additionally, the previously underexplored topic of musical therapy has been proven through clinical trials. Music within advertising possesses the ability to manipulate human behaviour through its unique melodic and rhythmic patterns, famous examples include McDonald's and Sleep Country's unique jingles, often included at the end of all commercials.

HOW IS MUSIC USED IN MARKETING TODAY?

Squarespace’s advertisement during the 2021 Superbowl opened to scenes set in a traditional office building, with workers separated into cubicles. As the clock struck 5 PM, all workers transformed their cubicles into a personalized online business, and Dolly Parton's song “9 to 5” started to play. (Youtube, 2019). The nature of the advertisement promoted negative connotations, glorifying the high cost of living, and white-collar workers need to maintain diversified sources of income to survive in society. Due to said reasons, the advertisement was not well-received by the public, with many claiming that their perception of the 80s classic was ruined by its usage in this commercial (Godfrey & Korschun, 2024). The omnipresent use of music in all commercialized institutions has changed the perception of the marketing industry. Studies have shown that our understanding of the cognitive perception of music is outdated, demonstrating our lack of knowledge within this field. Older research suggests that a reaction to music is a classical conditioning model, which is a connection between behaviours and positive stimuli (Beard, 2021). However, more recent studies indicate more complex interactions. For first notes, consumers will call back to their memory and find similar rhythmic and melodic patterns that best match the song (Peretz, 2009). Quoting Godfrey: & Korschun, 2024 “Once recognized, the music and its contextual associations are layered into the existing schema of music knowledge”. The new discoveries revolutionize music’s usage in a commercial setting, putting heavier emphasis on rhythmic and melodic values through all marketing campaigns.

HUMAN REACTION TO DIFFERENT MUSICAL CHORDS:

As discussed earlier, different music chords evoke different emotions. When referencing commonly used chords within commercial music, Major, Minor, Diminished and Augmented chords are

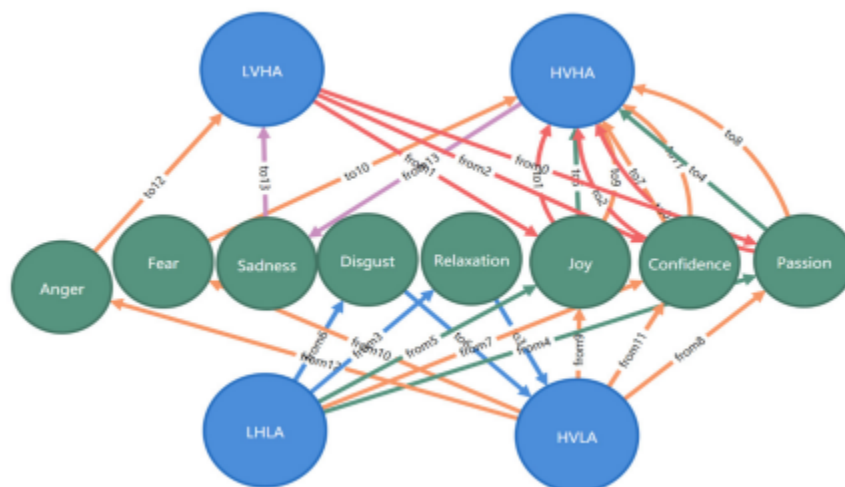
often referred to. Major chords are defined by a Major 3rd interval (4 semitones), followed by a Minor 3rd(3 semitones), while minor chords are defined as Minor 3rd to Major 3rd. Augmented and Diminished chords are Major 3rd followed by Major 3rd, and Minor 3rd followed by Minor 3rd, respectively.

The current method of studying the chromatic ordering of stages within the auditory process is ERP, a neurophysiological signal elicited in response to a sensory or behavioural event, which comprises several components that are supposed to originate from distinct neuronal populations (Ellison et al., 2015). Further ERP studies show that the early sensory encoding of sound features in the primary auditory cortex, as tabulated by the N1 Component, peaks at around 100ms post-exposure to the stimuli. Prior Research tested musically naive test subjects' ability to rate Major and Minor ending cadences, transposed to be within all keys. (Ellison et al., 2015) In certain chords, the fifth note is to be lowered by 30 percent so it becomes out of tune and unresolved by Western musical conventions. Subjects were then asked to deem the chords either correct or incorrect, and if the said chord sounds happy or sad. Participants were more likely to agree with the predicted rating of each chord, which was determined by the stature of the chord. (Major/Minor, Lowered/Unlowered) Additionally, chords that are tuned correctly are often identified as happy, vice versa. Major ending cadences were often more likely to be rated as correct than minor ending cadences, indicating the association between positive emotions and major chords, regardless of their tune. Participants' reaction time was also monitored during the experiment, showing faster RT to positive correlations (Happy, Correct) and slower to negative correlations (Sad, Incorrect).

However, the cognitive ability to differentiate between happy and sad music is often not the driving force to influence consumer spending probabilities. Listening to specific sets of music is not directly correlated to the feeling aroused. This differentiates depending on the subject's emotional state, as demonstrated in Figure 1. The valence and arousal of test subjects are often uncorrelated with the simple Happy and Sad emotions, rather with complex emotional webs. (Zhou et al. 2022)

Figure 1:

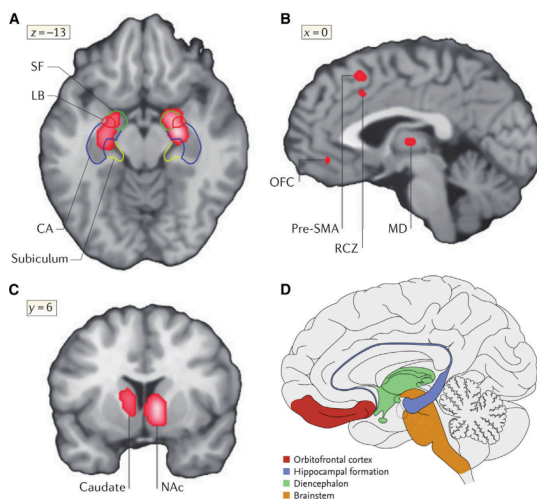
Demonstrates the effect of music in changing human feelings using diversified music videos. Blue is starting feelings and Green is emotions demonstrated in the video. (Zhou et al. 2022)



LVHA= Low Valence High Arousal
HVHA= High Valence High Arousal
LHLA= Low Valence Low Arousal
HVLA= High Valence Low Arousal

Neurologically, it is widely accepted that the usage of music may evoke emotions; however, the correlation between emotions and thought has not been established. (Koelsch, S., 2018) Through consistent experimental trials, it is established that music has the ability to alter human decisions. In a study conducted by Schulreich et al. 2014, volunteers were asked to listen to 30-second instrumental fragments that represented happy, sad or neutral emotions. The genres ranged from classical to pop, and volunteers were asked to choose between lotteries with a higher risk factor or a lower risk factor. Researchers found consistency in volunteers choosing the risky lottery over more conservative ones after listening to music that they deemed to evoke positive emotions.

Figure 2:
Diagram of areas of the brain affected by music. (Koelsch, S., 2018)



METHODS

Data Collection

This research utilized the Top 50 Advertisements from “The Drum”. A comprehensive data set of top advertising music to represent a cross-section of musical use in advertisements. First, the list was put into ChatGPT with the prompt to find the key signature, time signature, motifs, context and mood of the advertisement's background music and organized it into a Google Sheets file. The advertisement was then analyzed for common denominators (World's Best Ads of All Time, 2015). To accurately spot trends in the music analyzed, time signature, Ostinato (Repeated motif), context, mood (asked to be analyzed by ChatGPT with either “happy or sad”), and any qualitative data helpful, including the advertisement's total

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earnings/length, were analyzed to make sure the advertisement was profitable enough to be included in this list. To test for general correlation between categorized motifs and key signatures, a Chi-Squared test of independence was conducted on the matrix, with the key signature on the x-axis and motifs on the y-axis. Using generative AI, the data was collected and organized into an Excel spreadsheet to discover common similarities and differences, and find musical quality if preferred by advertisers.

Data Manipulation

Based on the information gathered, a conclusion on our research questions was reached, spotting common denominators across successful advertisement campaigns. Specifically, 3 statistical tests were implemented to find the common denominator between the advertisements selected. Firstly, a Binomial PDF was run on the mood. The returning results indicated whether there was a significant difference between the number of successful advertisements and their mood (happy or sad). The same process was implemented for the time signature. Lastly, a Chi-Squared test of independence was performed to look for general correlations between key signatures and motifs.

Calculations:

Key Signature	Ambient	Orchestral	Other	/Emotional	Playful	Rhythmic	Suspenseful
A major	0	0	1	1	0	0	0
A minor	0	0	1	0	0	1	0
B minor	1	0	1	0	0	1	0
Bb major	0	1	0	0	0	0	0
Bb minor	0	0	1	0	0	0	0
C major	0	0	2	1	1	1	0
C minor	1	1	0	0	0	0	0
C# minor	0	0	0	2	0	0	0
D major	0	1	0	1	1	3	0
D minor	0	1	1	0	0	0	0
E major	0	1	1	0	0	0	1
E minor	0	0	1	0	0	1	0
Eb major	0	0	1	0	0	1	0
Eb minor	0	0	0	0	0	1	0
F major	0	0	1	1	0	0	1
F minor	0	0	1	1	0	0	0
F# major	0	0	0	0	0	1	0
F# minor	0	0	0	1	0	0	1

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Key Signature	Ambient	Orchestral	Other	/Emotional	Playful	Rhythmic	Suspenseful
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A minor	0	0	1	0	0	1	0
B minor	1	0	1	0	0	1	0
Bb major	0	1	0	0	0	0	0
Bb minor	0	0	1	0	0	0	0
C major	0	0	2	1	1	1	0
G major	0	0	1	2	1	1	0
G minor	0	0	2	0	0	0	1

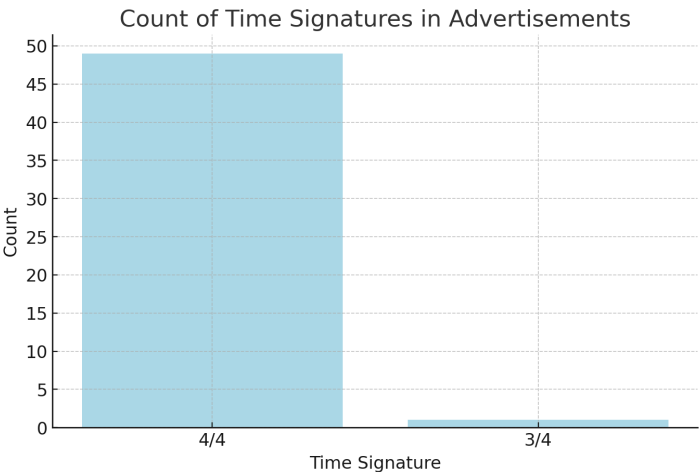
By running a Chi-squared test of Independence, we found a p-value of 0.316 and a X^2 statistic value of 20.30. This demonstrated a non-significant general correlation between key signatures and motifs. However, qualitatively, we spot that in the top 5 most used key signatures, 4 were identified to be major keys.

RESULTS

Interpretation and Analysis of Results

Based on our calculated value of Chi-Squared, we found a p-value higher than the acceptable 0.05. This demonstrated the lack of correlation between specific motifs and key signature pairing. Through this, we were able to develop a formula that best maximizes the profitability of advertisements. Qualitatively, we spotted that D major most often correlates with rhythmically driving motifs, with 50% of all D major advertisements encompassing rhythmic and upbeat characteristics. The suspenseful advertisements saw no specific correlation to a key signature, with 50% being from major, and the other 50% being minor. Furthermore, we spot that the overwhelming majority of music is in 4/4 time. More specifically, 47 out of 50 are all spotted as 4/4 time.

Figure 3:
Count of Time Signature in the Advertisements



Through collected data, the displayed trends aligned with our previous hypothesis. Of the top five key signatures, four displayed to be Major Key signatures. (Ellison, D., Moisseinen, N., Jörg Fachner, & Brattico, E. *Affective Versus Cognitive*) Furthermore, 90% of the advertisements' background music is identified as having the majority of positive emotions. A significant level of approximately 2.4×10^{-9} , achieved through a binomial PDF test, is reached assuming that both happy and sad emotions have equal probability of appearing.

Figure 4:
Happy vs. Sad Mood counts of the background music within the advertisement

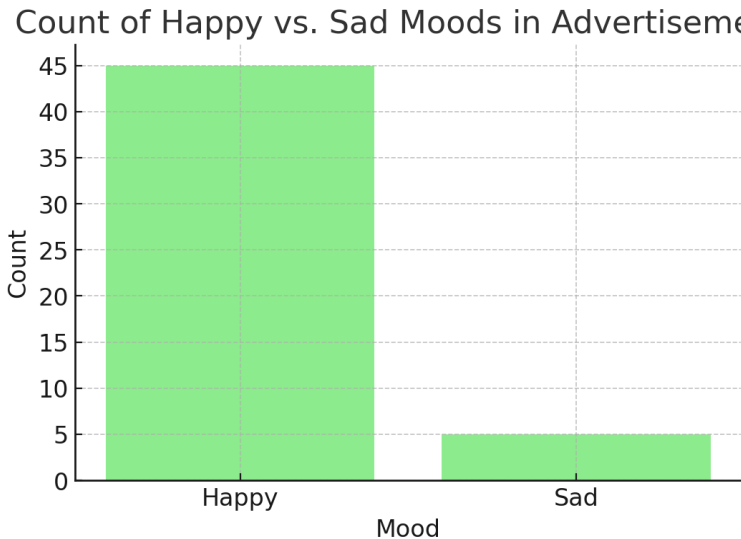
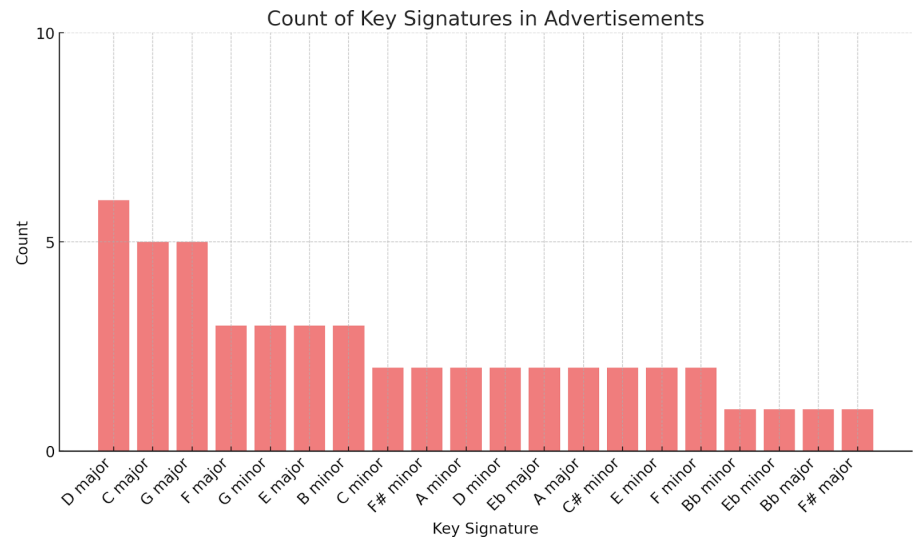


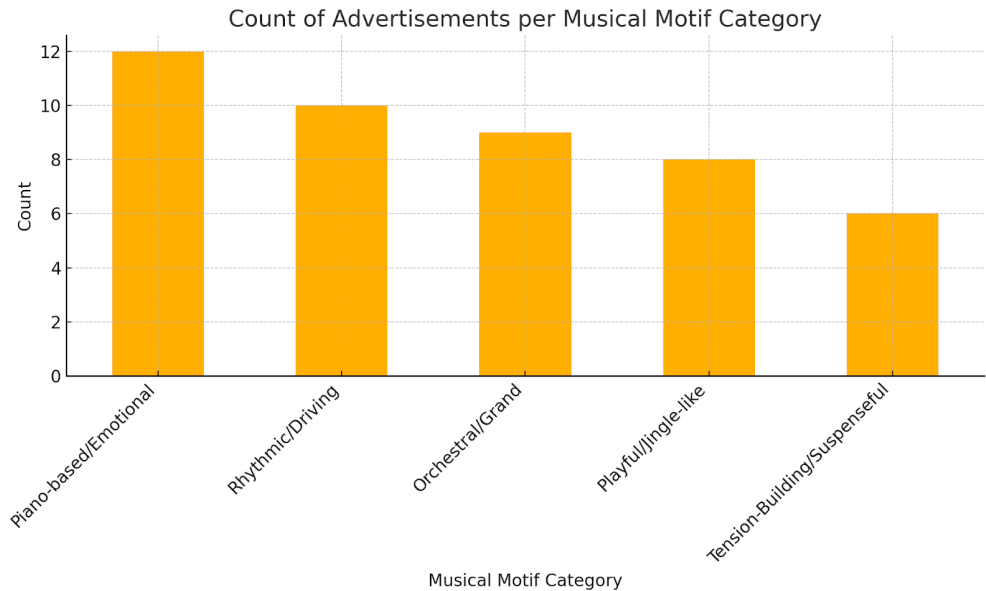
Figure 5:
Count of Key Signatures in the Advertisements



Utilizing the data collected, a few conclusions were reached that aided in answering our research questions. Firstly, an overwhelmingly positive trend was found in the reliance on major key signatures, mainly Major D, C, G, F, and E. The usage of these key signatures resonates with traditional compositional habits of Western music. Exemplified by Mozart's extensive catalogue within C and G majors, composers often fall back to these key signatures due to their variability and ease of creating motifs and resolutions. (Rom & Rosset, 2023)

Within the commercials utilized, an observed trend of piano-based and rhythmic motifs, at 22% and 20% respectively. Mostly due to its simplicity and natural harmonic properties, the piano remains one of the easiest compositional tools. Furthermore, heightened focus and concentration are often correlated with classical music, in turn, offering explanations for the high audience engagement with classical music arrangements(Gao, Fillmore, and Scullin 2020). Rhythmic motifs grab the audience's attention through sheer chaos within the composition. Similar to how runners perceive running as lower effort when listening to rhythmic music due to increased concentration, melodically simple and rhythmically active background music grabs audience attention especially well.

Figure 6:
Collection of Motifs into Categories



Furthermore, we spot positive trends regarding affirmative moods in the advertisement examined. Said discovery aligns with consumer purchasing habits, as positively influenced customers are more likely to make impulsive purchases.

DISCUSSION

Generally, the collected data aligned with literature reviews and the theorized hypothesis. The Major keys take the majority within the compositional process. This finding aligns with past paper reviews, demonstrating the inherent correctness of major ending cadences. Furthermore, an overwhelming trend leaning towards positive moods evoked within the advertisement was spotted, aligning well with the past literature review, increasing impulse buy. A finding of note is that adverts consisting of suspenseful musical elements were widely utilized, with its key signatures mainly minor. This contradicts prior literature studies, stating that positive mood and correct chord progressions increase buying opportunities. However, minor keys within the music are often utilized to implement suspense, rather than evoking negative emotions. Hence, it is justified that some adverts utilize minor key signatures.

Overall, the results presented align well with the hypothesis, and the trends spotted best generalize past literature review. Interestingly, an elevated number of suspenseful advertisements was present. Although contradicting past research, this result falls out of trivial prediction.

CONCLUSION

Overall, the experiment demonstrated and identified existing musicality preferences of successful advertisement campaigns. The literature review effectively provided background knowledge in

hypothesizing and explaining trends within the data collection process. The cadence experiment effectively visualized the expected trends within the data collected and offered insight on the team's expectations. Through this, we developed a correlation between the motif and key signature utilized in successful advertisements. Interpreting the results, we find that particular successes are found when companies incorporate piano-based music in the key of D Major. This finding aligns with our hypothesized theory, in which major-keyed music is more likely to invoke impulse purchase. Furthermore, we spotted tense and suspenseful music to be unexpectedly effective. Overall, the experiment provides basic guidelines companies may follow in hopes of producing successful advertisement campaigns. However, it is important to note that the quality of the product contributes the majority to the brand's overall success; therefore, it is inconsiderate to base product development solely on the guidelines provided.

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