

Title	The effects of multiplatform engagement and temporal dynamics on K-pop digital performance
Sub Title	
Author	王, 露曦(Wang, Luxi) 井上, 哲浩(Inoue, Akihiro)
Publisher	慶應義塾大学大学院経営管理研究科
Publication year	2024
Jtitle	
JaLC DOI	
Abstract	
Notes	修士学位論文. 2024年度経営学 第4221号
Genre	Thesis or Dissertation
URL	https://koara.lib.keio.ac.jp/xoonips/modules/xoonips/detail.php?koara_id=KO40003001-00002024-4221

慶應義塾大学学術情報リポジトリ(KOARA)に掲載されているコンテンツの著作権は、それぞれの著作者、学会または出版社/発行者に帰属し、その権利は著作権法によって保護されています。引用にあたっては、著作権法を遵守してご利用ください。

The copyrights of content available on the KeiO Associated Repository of Academic resources (KOARA) belong to the respective authors, academic societies, or publishers/issuers, and these rights are protected by the Japanese Copyright Act. When quoting the content, please follow the Japanese copyright act.

慶應義塾大学大学院経営管理研究科修士課程

学位論文（ 2024 年度）

論文題名

The Effects of Multiplatform Engagement and Temporal Dynamics on K-Pop Digital Performance

主 査	井上 哲浩 教授
副 査	坂下 玄哲 教授
副 査	大西 浩志 准教授
副 査	

氏 名	王 露曦
-----	------

論文要旨

指導教員	井上 哲浩	氏名	王 露曦
(論文題名) The Effects of Multiplatform Engagement and Temporal Dynamics on K-Pop Digital Performance			
(内容の要旨) This research is divided into six chapters, where one chapter builds on the other to provide a complete analysis of the topic. Chapter 1: Introduction The research background, objectives, significance and the structure of the dissertation are introduced. The rationale for the research is outlined in this chapter and the critical questions which will be addressed are introduced. Chapter 2: Literature Review A literature review of the impact of digital platforms on music performance in the K-pop industry is consolidated. Key themes include platform specific engagement, the role of time lag effects in audience engagement, and the interplay between content, interaction and follower metrics to determine performance outcomes. This chapter synthesizes existing studies, and provides the foundation for the current research while identifying gaps in the existing literature this dissertation aims to address. Chapter 3: Methodology The last chapter, methodology, describes the research design, methods used in data collection and the analytical techniques used in answering the research questions. This study takes a quantitative approach, using regression analysis and structural equation modeling (SEM) to model the relationships between engagement metrics, platform specific performance and digital success. In addition, the chapter outlines the variables that were considered in the analysis of follower counts, likes, comments, video views, and streaming metrics. Chapter 4: Results of Analysis Results of the quantitative analysis are presented in this chapter. It gives a detailed breakdown of the data, descriptively, regression results and structural equation modeling outputs. The key findings are the differential impact of platforms on performance, the time lag effects between engagement and performance, and the relative importance of content, interactions, and followers in determining outcomes. Chapter 5: Discussion In the discussion chapter, the findings are interpreted in light of the existing literature, and provide insights into how digital platforms affect the success of K-pop groups. The implications of these findings for marketing and engagement strategies in the music industry are explored, including platform specific approaches and campaign timing. The limitations of the study are also addressed and directions for future research are suggested. Chapter 6: Conclusion The conclusion chapter discusses the major findings and their implications for the digital music industry. This reinforces the need to understand platform specific dynamics and time lag effects in driving long term success. Further, specific recommendations to K-pop groups, the record labels and marketers are offered on how to leverage effectively their digital platforms to ensure sustained engagement and global success.			

TABLE OF CONTENTS

CHAPTER 1: INTRODUCTION	3
1.1. Research Background.....	3
1.2. Research Objectives.....	6
1.3. Research Significance	7
CHAPTER 2: LITERATURE REVIEW	9
2.1. Global Music Markets: Platform Specific Dynamics	9
<i>2.1.1. The Influence of Emerging Diversity of Platforms.....</i>	<i>9</i>
<i>2.1.2. Demographic and Cultural Influences on Platform Engagement.....</i>	<i>10</i>
<i>2.1.3. Challenges and opportunities in multi-platform strategies.....</i>	<i>12</i>
2.2. The Temporal Effects of Digital Media Engagement.....	13
<i>2.2.1. Conceptualizing Time Lag Effects.....</i>	<i>13</i>
<i>2.2.2. Social Media and Streaming Platforms Empirical Evidence</i>	<i>14</i>
<i>2.2.3. Implications for Strategic Music Marketing.....</i>	<i>15</i>
2.3. The Impact on performance of Content, Interaction, and Followers.....	16
<i>2.3.1. Foundational Role of Quality Content</i>	<i>16</i>
<i>2.3.2. Interaction Dynamics and Algorithmic Amplification.....</i>	<i>17</i>
<i>2.3.3. Converting Engagement into Long-Term Loyalty.....</i>	<i>18</i>
2.4. Research Gap and Hypotheses.....	19
CHAPTER 3: METHODOLOGY	21
3.1. Research Design	21
3.2. Data Collection	22
<i>3.2.1. Data source and selecting a sample</i>	<i>22</i>
<i>3.2.2. Data Period</i>	<i>23</i>
<i>3.2.3. Variable Explanation</i>	<i>24</i>
<i>3.2.4. Variable Categorization</i>	<i>26</i>
3.3. Analytical Methods.....	29
<i>3.3.1. Regression Analysis</i>	<i>29</i>
<i>3.3.2. Structural Equation Modeling (SEM).....</i>	<i>30</i>
3.4. Data Preparation and Analysis Procedures.....	32
CHAPTER 4: RESULTS OF ANALYSIS	35
4.1. Cumulative Trends Analysis	35
<i>4.1.1. VI for Youtube Channel Views.....</i>	<i>36</i>
<i>4.1.2. II for TikTok Likes</i>	<i>37</i>
<i>4.1.3. FcI for YouTube Subscribers.....</i>	<i>39</i>

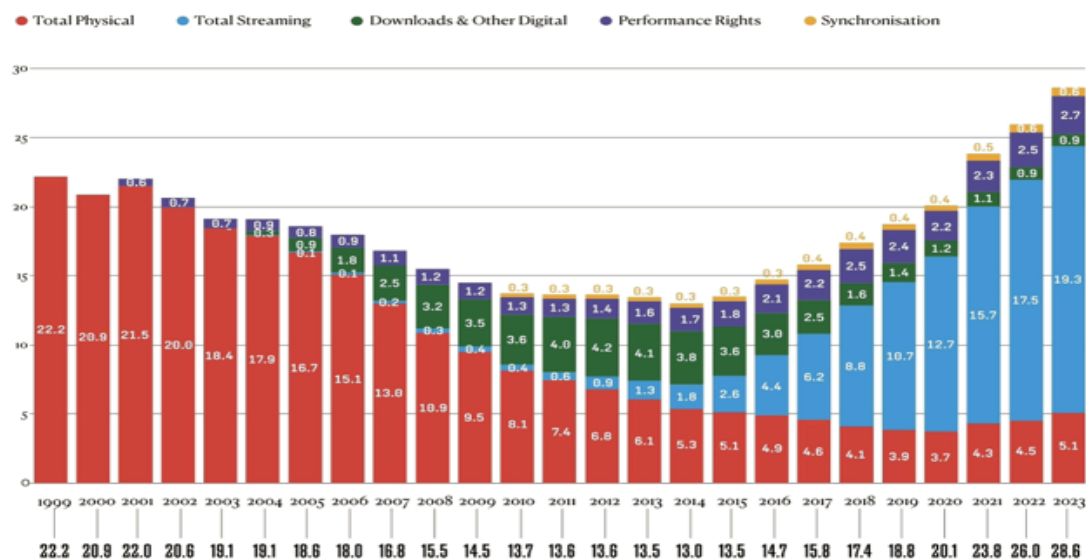
4.1.4. <i>FsI for Instagram Followers</i>	41
4.1.5. <i>Summary of all 14 variables of 9 K-pop Groups</i>	43
4.2. Results of Regression Analysis	46
4.2.1. <i>Results of the Regression Analysis (Concurrent Effect Model)</i>	46
4.2.2. <i>Results of the Regression Analysis (Concurrent and Time-Lag Effect Model)</i>	53
4.2.3. <i>Overall Results of the Regression Analysis</i>	71
4.3. Results of Structural Equation Modeling (SEM)	74
4.3.1. <i>SEM Model Fit and Overview</i>	74
4.3.2. <i>Results of the SEM with effect of the “Interaction”</i>	75
4.3.3. <i>Results of the SEM with effect of the “Follower of content platform”</i>	76
4.3.4. <i>Results of the SEM with effect of the “Follower of social media platform”</i>	78
CHAPTER 5: DISCUSSION	80
5.1. Platform-Specific Dynamics in K-pop Performance	80
5.2. Temporal Dynamics of Engagement	82
5.3. The Relationship Between Content, Interaction, and Followers	85
5.4. Theoretical and Practical Contributions	87
CHAPTER 6: CONCLUSION	89
6.1. Summary	89
6.2. Contributions and Innovations	90
6.3. Limitations and Future Research Directions	91
References	93
Acknowledgment	95

CHAPTER 1: INTRODUCTION

1.1. Research Background

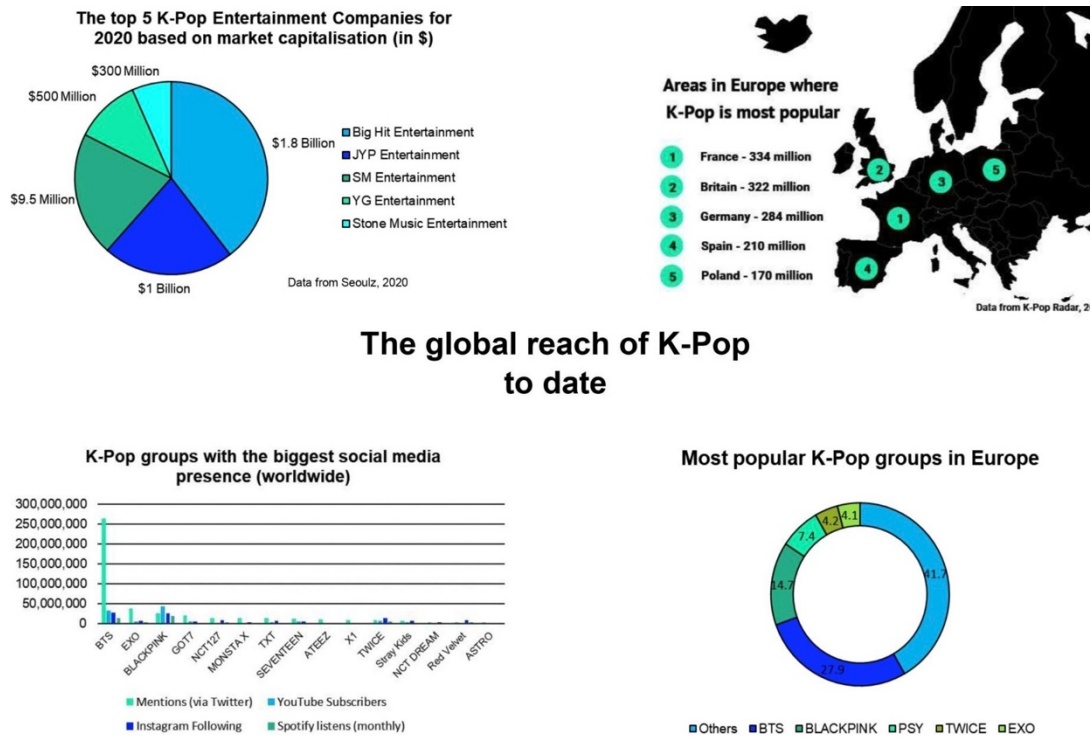
Over the past two decades, the global music industry has undergone a profound transformation driven by the digital revolution. The emergence of streaming services, social media, and mobile technologies has reshaped both music consumption and promotion. Platforms such as YouTube, Spotify, Instagram, and TikTok have not only redefined how audiences engage with music but have also fundamentally altered the strategies used by artists, record labels, and marketers to reach their target audiences. The global revenue structure of the music industry reflects this shift, with physical music sales steadily declining over the past two decades (see Figure 1-1), while streaming services have established themselves as the dominant revenue driver. Consequently, digital platforms have become critical in shaping music consumption and monetization worldwide, highlighting the necessity of platform-specific strategies in this evolving landscape.

Figure 1-1. Global Music Industry Revenue by Format (1999–2023)



Source: IFPI Global Music Report 2024

Figure 1-2. The global reach and digital influence of K-pop groups

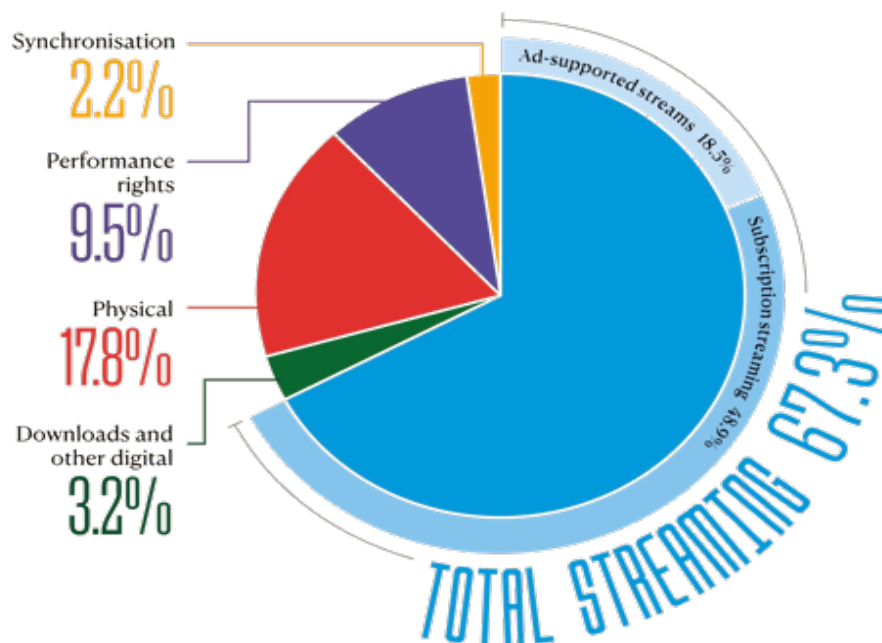


Source: NTU Shorthand Stories, "The K-Pop Phenomenon in the UK" (2020)

Quite possibly, the most emblematic example of using digital platforms to become globally influential is the K-pop (Korean pop music) industry. BTS and BLACKPINK are just two of the groups to have become international superstars, with millions of fans and global rebranding of the music scene. BTS and BLACKPINK lead social media metrics, with more than 70 million and 80 million YouTube subscribers, respectively, the most followed musical acts on the platform, according to recent data. K-pop groups are also popular on Spotify, where their monthly listeners span the tens of millions, in addition to (Figure 1-2). Just as noticeable is the economic impact of K-pop: at the end of 2020, K-pop label Big Hit Entertainment (now HYBE) reached a market capitalization of USD 1.8 billion, surpassing other major industry incumbent JYP Entertainment and YG Entertainment (Figure 1-2).

Additionally, the fact that K-pop reaches globally, including for its regional popularity, is shown in Europe. France, Britain and Germany are leading the European market with hundreds of millions of streams per year. The regional dynamics (Figure 1-2) show how K-pop adapts to the cultural context of different regions and how platform specific strategies are important in driving international success. Although this success brought with it challenges, from understanding the complexities in platform algorithms, keeping engagement levels high, to meeting the increasingly competitive landscape in global markets.

Figure 1-3. Global Music Revenue Distribution by Format



Source: IFPI Global Music Report 2024

Despite its mass popularity, K-pop still lacks academic research that considers how the performance and growth of K-pop can be attributed to different digital platforms. Each platform offers unique engagement mechanisms: YouTube is all about video content, Instagram is a visual storytelling platform, Spotify tracks listener patterns, TikTok is viral short form content. Figure 1-3 shows how

streaming services have taken over the global music industry revenue, representing more than two thirds of the market. In the streaming world, the potential for growth comes from both subscription and ad supported models. In this light, the domination of streaming brightens the reasons why K-pop groups definitely need to concentrate on digital engagement strategies of each of the several online platforms. In order to maximise reach and to continue to succeed globally, it is vital to understand how different types of digital engagement help with overall performance.

To fill these gaps, this dissertation explores the relationship between platform specific engagement metrics, social media strategies, and their effects on the digital performance of K-pop groups. This amounts to a detailed quantitative analysis of the following K-pop group variables, including followers, interactions, and content consumption, on multiple platforms to understand the critical insights of how digital platforms shape the K-pop group success and performance in global markets. Beyond understanding K-pop's digital strategies, the findings will also help to shed light on the digitalization of the global music industry.

1.2. Research Objectives

This research focuses on examining how different digital platforms, such as YouTube, TikTok, Instagram, and Spotify, have impacted the performance of K-pop groups. Specifically, the study addresses three key objectives.

First, the research investigates the differential impact of various platforms on K-pop group performance. Video-centric platforms like YouTube and TikTok are often prioritized due to their capacity to showcase visually engaging content. In contrast, audio streaming platforms such as Spotify highlight the importance of music consumption patterns. This study aims to explore how platform-specific strategies can optimize performance by aligning content with the unique characteristics and user preferences of each platform.

Second, the study seeks to explore the temporal effects of engagement on performance. It analyzes how interactions and audience engagement on social media platforms translate into outcomes like streaming metrics and overall success over time. Existing literature suggests that engagement does not always result in immediate performance improvements in digital ecosystems, where user behaviors and content impact may evolve gradually. This research will focus on understanding these time-lagged effects and their implications for sustained performance.

Third, the research aims to uncover the interplay among follower growth, user interactions (e.g., likes, comments, and shares), and content quality in influencing digital performance. By examining these interconnected factors, the study will explore how they collectively drive success across platforms. Furthermore, it will investigate how these dynamics contribute to the long-term sustainability of K-pop groups in a competitive digital landscape.

1.3. Research Significance

This study has important findings. Firstly, this research provides a better understanding of how contemporary entertainment industries should strategically engage with its digital technologies and audiences by understanding the role of digital platforms in K-pop groups' success. As music promotion continues to go digital, artists, managers and marketers are forced to optimize their use of multiple platforms to build and maintain global fanbases.

Secondly, the study offers important insights into the notion of platform specific strategies. Existing literature on the role of digital platforms in music consumption is extensive, but there is little research on how groups should adjust their marketing strategy across different platforms. Since user behavior, content consumption and engagement vary on YouTube, TikTok, Spotify and other platforms, it is important to know these differences in order to develop a successful

long-term strategy.

Thirdly, the research provides a nuanced understanding of time-lag effects in digital engagement. With digital marketing becoming increasingly optimized, businesses and artists need to realize that short term campaigns do not always mean instant results. The delayed impact of engagement activities on audience behavior will help in better resource allocation and campaign management.

Finally, this study shows the significance of cross platform synergies. In the fast-changing digital landscape, understanding how the interplay between platforms affects performance metrics is vital for long term success in the competitive entertainment business.

CHAPTER 2: LITERATURE REVIEW

2.1. Global Music Markets: Platform Specific Dynamics

2.1.1. The Influence of Emerging Diversity of Platforms

The digital age has created a hyper fragmenting music industry with each online platform having individually distinct features and audience segments. It is widely agreed that these platform characteristics quite significantly influence promotional strategies of music companies and artists (Jones, 2019; Smith et al., 2020). From radio play to CD sales, we see artists now moving past that and heading to places like YouTube, TikTok, Spotify and Instagram, each with its own set of challenges and opportunities.

For instance, video-based music consumption is now a cornerstone of YouTube. In Kim (2021), computational techniques were used to analyze over 10,000 recommended video paths of popular YouTube music channels. By clustering this data using machine learning algorithms, the study unearthed a “rich-get-richer” loop: the algorithm recommends the more engagement a video gets. But such feedback mechanisms hold back new artists trying to stand out in a crowded space. This is algorithmic bias compared with older consumption models, where radio stations were the gatekeepers of what you would hear. Now, watch time, likes, and comments are digital metrics that have a lot of power, but they can exacerbate preexisting popularity disparities (Kim, 2021).

Another platform that’s risen in influence is TikTok, a platform for short form video content that can go viral. In their work, Chen and Zhao (2020) examined how songs become widely known on TikTok using an ethnographic approach (observing and analyzing user interactions, hashtags, and viral challenges) over six months. This study discovered that an unknown track could become a global hit within days if it has a catchy hook or visually distinctive challenge. Being ephemeral and swiftly engaged with 41% of TikTok users between the ages of 16 to 24 (also known as the younger demographic, however, not the younger in the

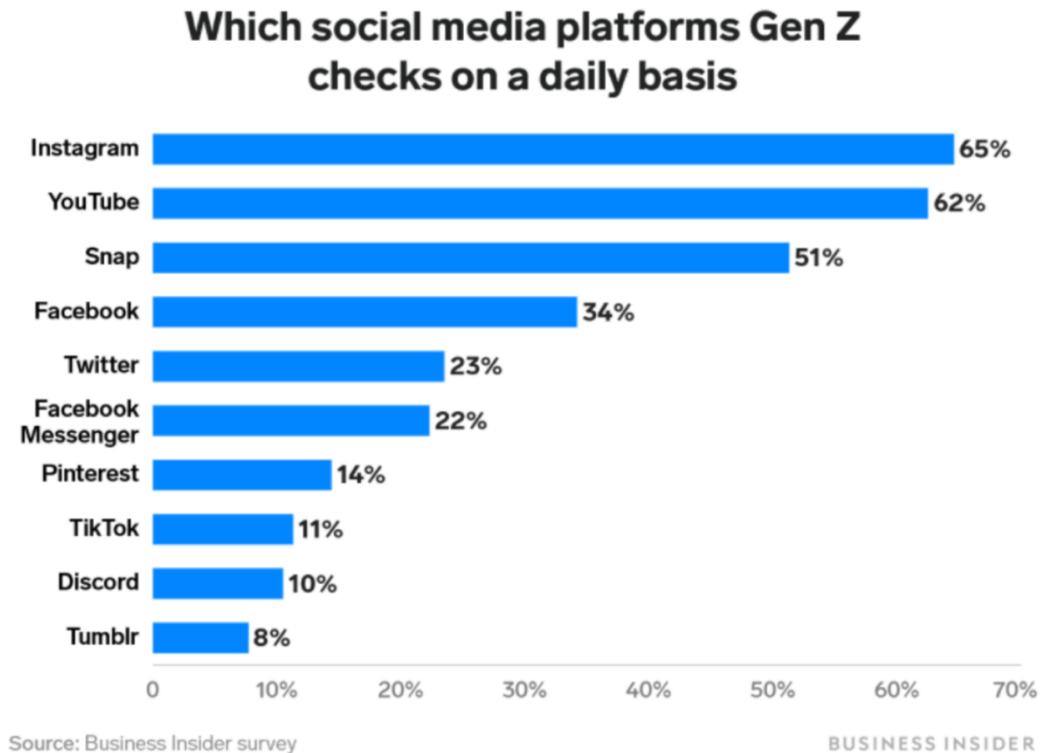
TikTok sense), it appeals to a younger crowd. This trend focused culture allows artists to leverage this to get immediate spikes in attention, but as Barker et al. (2022) point out, virality on TikTok often dies unless accompanied by a strategy of nurturing sustained listener engagement on other platforms.

On the other hand, Spotify, the world's biggest audio streaming platform, relies on personalized playlists for discovery (Anderson et al., 2021). Anderson and colleagues use a combination of user surveys and playlist analyses to bring to light how algorithmically generated playlists (e.g., Discover Weekly, Release Radar) facilitate sustained, long term discovery patterns. Using their mixed methods research, they found that ~70% of users surveyed discovered at least one new artist per week via these playlists, demonstrating the impact Spotify has on building an artist's audience over time. Yet, they also mentioned that simply getting playlist placement is not enough for long term loyalty as it takes ongoing content releases and cross platform engagement to keep new listeners (Anderson et al., 2021).

2.1.2. Demographic and Cultural Influences on Platform Engagement

Demographic and cultural variables strongly affect the choice of platform and patterns of engagement. As noted by Walker (2018), age is still the biggest predictor of platform preference. For daily interactions, younger audiences (and Gen Z in particular) favour platforms such as Instagram, YouTube and Snapchat. According to Figure 2-1, 65% of Gen Z check Instagram daily, 62% check YouTube, and 51% check Snapchat. But Facebook (34%) and Twitter (23%) are more popular with older audiences. It shows that younger demographics are attracted to visual and short form content, and platforms with longer form content tend to attract a broader range of age groups.

Figure 2-1. Daily usage of social media platforms among Gen Z



Source: Business Insider survey (2023)

While Instagram has a visually driven interface that appeals to a broad age range, TikTok, a highly popular site for viral challenges and short form videos, is only used daily by a smaller proportion of Gen Z (11%) than other platforms such as Instagram and YouTube (Figure 2-1). The fact that TikTok's trend focused culture has more impact on gaining attention than its daily use frequency among Gen Z, which is less dominant than platforms like Instagram and YouTube, suggests this.

Apart from age-based differences, cultural preferences also play a huge role in digital music consumption (Tanaka, 2020). For example, Tanaka conducted a cross sectional survey in Japan where he compared the user preference of local streaming service (Line Music) to global streaming service (Spotify). The analysis found that Line Music's integration into the popular messaging app Line helped it win, because the localized content and smoother user experiences catered to

Japanese cultural tastes. By taking a historical comparative approach, Park and Lee (2019) charted K-pop's global proliferation and showed that particular promotional tactics – e.g., localized subtitles on YouTube or partnering with TikTok – mattered greatly in getting them into foreign markets. K-pop labels consequently optimized their footprint globally while at the same time, not overlooking how consumers consumed locally.

Also, comparing across regions and see how some platforms are more important than others. For example, Twitter is still a key way for bands to promote music in Japan (Tanaka, 2020), while in the US, Instagram Stories, Reels and TikTok are often more powerful. Tanaka analyzed over 15,000 tweets to see if artist mentions were present and found that the real time updates and fan interactions on Twitter led to a dynamic feedback loop for Japanese audiences that created intense engagement during music releases. Where Twitter user penetration is low, however, these strategies may be less effective. As such, the research concludes that successful campaigns are not built on generic, one size fits all content, but rather on the local platform preferences and cultural norms.

2.1.3. Challenges and opportunities in multi-platform strategies

While wide platform coverage has many benefits, it is also difficult. In his (2021) study of multi-platform management hurdles, Mitchell employed structured interviews with 100 artists and music managers and found audience fragmentation to be a main concern. One advantage of follower loyalty is that most of your people will follow you to another platform, but followers on one platform may not transition over seamlessly to another so you'll need to create a different content strategy for each channel. However, this fragmentation can reduce overall engagement unless an integrated marketing communications (IMC) plan combines the messages across the platforms (Smith et al., 2020).

Algorithmic variance is one of another challenges. Gordon et al. (2020) identified conflicting incentives across different platforms: TikTok incentivizes short, frequent posts with good shareability, YouTube pushes for watch time and viewer retention for instance. By comparing 50 multi-platform campaigns, Gordon and colleagues found that TikTok optimized content may not be as successful on YouTube. Thus, videos, imagery, and textual elements need to be adapted to each platform's requirements, and time and resources are often strained in answering this need (Gordon et al., 2020).

However, if executed well, a multi-platform approach can yield great benefits. Artists who go viral on TikTok can send new fans to Spotify or YouTube to engage and monetize in larger, longer term ways (Rahman et al., 2021). Just as much, a strong brand narrative on Instagram can increase offline event attendance or merchandise sales. The key is synergy: Every platform has to fulfill a unique yet interconnected role in the overall marketing funnel, beginning with awareness, moving through deeper engagement, and ultimately loyalty (Smith et al., 2020). Finally, these studies validate that a data driven, informed strategy can leverage the best attributes of each platform while minimizing cross platform problems.

2.2. The Temporal Effects of Digital Media Engagement

2.2.1. Conceptualizing Time Lag Effects

Digital platforms can create a tremendous amount of attention in a short period of time, but the relationship between content exposure and measurable outcomes is rarely instantaneous (Johnson et al., 2017; Martin, 2018). It's called the "time-lag effect," an idea that consumer behaviors (like listening to a song, buying a piece of merchandise, or attending a concert) appear over time. This concept was substantiated by Sharma and Patel (2020) who ran a time series analysis on social media mentions for 20 up and coming music artists over the course of a year. They used ARIMA (autoregressive integrated moving average)

models to correlate mentions on Twitter, TikTok and Instagram with monthly streaming and purchase data. They found that spikes in online chatter were delayed by two to three weeks before translating into a bump in streams or sales.

From one theoretical lens, the hierarchy of effects framework (Brown & Taylor, 2022) can clarify these delays. Audiences tend to follow a sequential path from awareness, to interest, to desire or conviction, before taking a specific action. As a result, an ad campaign or a viral TikTok video can create instant buzz, but further reinforcements like repeated social media exposure, user generated content, or recommendations are needed for that initial excitement to solidify into a long-term listening habit or purchase decision. In a sample of 50 international artist campaigns, Brown and Taylor (2022) were able to show how awareness does not always immediately convert, but rather happens after multiple touchpoints over several weeks or months.

2.2.2. Social Media and Streaming Platforms Empirical Evidence

The platform determines how temporal gaps manifest differently. Using a panel dataset of 30 TikTok-viral songs, Nguyen and Tran (2021) collected daily Spotify stream counts and TikTok video mentions. We integrated sentiment analysis of TikTok captions to quantify buzz quality and found a consistently observed lag of one to two weeks between a TikTok trend and a corresponding surge in Spotify streams. TikTok, meanwhile, is a platform of immediate virality, and so it can take time to get people to platform switch and build a habit, which explains the lag before users add songs to playlists or watch them later.

Lopez et al. (2019) also employed a mixed method approach (quantitative analysis of Instagram follower growth and qualitative interviews with 15 marketing managers) to show that Instagram driven brand awareness takes weeks to convert into sales or event attendance. While interviewees argued that a single high impact post might get you a quick spike in likes or comments, deeper engagement could

be found through consistent storytelling across multiple posts. The interplay between short term interactions and longer-term consumer actions is particularly interesting in the music industry, where ephemeral 'buzz' can quickly dissipate if not continually nurtured.

In order to understand average lag times for different platforms, Lin et al. (2020) conducted a meta-analysis of 25 social media marketing studies. After coding each study for variables such as platform type, content format, and measurement intervals, they concluded that Instagram campaigns generally see tangible outcomes (new follower gains and incremental sales) within 5 to 10 days, while Facebook driven campaigns can take up to 30 days to see similar lift. It could be that Facebook users are older and behave differently than Instagram users, and use the platform more slowly, or that Instagram's visual immediacy brings quicker, but shorter lived, reactions.

2.2.3. Implications for Strategic Music Marketing

It is important to note that timing of effects is required to be recognized for realistic and effective marketing strategies planning. According to Lin et al. (2020), campaigns should be planned with longer timelines. Music marketers should instead introduce a series of 'touches' over weeks or months, rather than a single short-term push. This pattern guarantees that initial spikes in interest develop into real loyalty or purchase decisions (Sharma & Patel, 2020).

Smith et al. (2020) provided a case study contrast between two major record labels: Label A ran quick, high intensity campaigns, around viral flashes, while Label B preferred a longer run, having marketing content distributed over a two-month window. The analyses of social media metrics and sales data found that while Label A tended to get more immediate visibility, Label B's approach resulted in more consistent, and ultimately more sustainable, growth in sales and streaming over a half year horizon. The conclusion was clear: But short-term hits are valuable,

and missing the deeper engagement might mean ignoring the full, nuanced arc of consumer decision making. This oversight often leads to misallocation of marketing budgets where unanticipated delays may demand premature cuts to campaigns or misestimate the effectiveness of the strategy (Johnson et al., 2017).

Ultimately, these provide evidence that good music marketing combines direct appeal with longevity. Viral moments are powerful generators of brand awareness, but real success comes when audiences move from a curious one off to a regular consumer. Time-lag theories thus highlight a critical balancing act: It creates the possibility to harness immediate momentum and sustain engagement over the long term to help convert one time interest into lasting fandom.

2.3. The Impact on performance of Content, Interaction, and Followers

2.3.1. Foundational Role of Quality Content

In digital music promotion, the bedrock of engagement across platforms is quality content in the complex environment. With the aim of understanding what the most effective posts are for artists to engage their audiences, Miller et al. (2019) conducted a large-scale content analysis of 2,000 social media posts from both emerging and established artists, classifying posts by content type (video, image, or text snippet) and evaluating engagement (likes, comments, shares) through regression analysis. High quality, visually appealing posts led to higher engagement metrics on visually oriented platforms such as Instagram and YouTube, the results showed. However, text heavy posts did slightly better on Twitter, indicating that content needs to fit the communication style of the platform to receive any meaningful interaction.

Clark (2020) did the same, using a survey experimental design to determine how production quality in music videos influences audience perception. We exposed participants to a low budget video from the same artist as a high production video. Respondents in the survey also said that they felt that the high

production video was more emotionally resonant and more credible in terms of brand, which both lead to greater likelihood to pass along. This opinion echoes the results from Lee et al. (2018) in the K-pop sphere, whereby music videos of high-quality visuals are well-received by the global audience and it demonstrates the importance of visuals in cutting through language barriers.

But ‘quality’ doesn’t just mean high production budgets. Ethnographic study of TikTok content conducted by Chen and Zhao (2020) emphasized on creativity, authenticity and brevity. Fan-centric videos that spark user participation with hashtag challenges can reach millions at very low cost. It’s about understanding the culture and mechanics of each platform, while creating content that either fits into or even plays against the grain of what’s trending to attract people.

2.3.2. Interaction Dynamics and Algorithmic Amplification

User interactions — likes, comments, shares — serve as accelerants that increase visibility, if content is the foundation. Several platforms base their models on algorithms that push content that gets more engagement on the top. Based on social network analysis (SNA), Kim and Park (2020) analyzed the sharing cascades of 100 viral music posts on both TikTok and Instagram. They mapped shares and likes across user networks to discover that a relatively small group of hyper engaged users could influence a massive community. Algorithms determined that when these influential nodes engaged, the content was widely appealing, and it was then promoted further across the platform.

But on TikTok, where user generated remixes and challenges can exponentially increase the rate at which a song spreads, it's even more pronounced. According to Smith et al. (2020), multiple record labels plan campaigns that encourage fan participation, because every duet, dance challenge, or comedic sketch that includes a snippet of a song not only increases user engagement but also feeds the platform’s discovery algorithm. This leads to a higher rate of content

being surfaced to others, and thus a potential of exponential growth patterns.

However, these engagements driven loops can create strategic dilemmas as each platform measures interaction differently (Gordon et al., 2020). That being said, TikTok may rely heavily on the number of shares, while watch time and completion rates may be the bedrock of YouTube's success. Platforms such as Instagram also like to keep things visually consistent in the feed (meaning it doesn't appreciate drastic changes in aesthetic which could throw you out of the momentum gained by previous posts in the algorithm). Artists and labels have to balance these disparate metrics in order to create a cohesive brand while leveraging the engagement triggers of each platform.

2.3.3. Converting Engagement into Long-Term Loyalty

While they offer a strong short-term boost, follower metrics, particularly for streaming services, are key metrics to measure long term fan commitment (Zhao & Kim, 2021). For instance, follower counts on Spotify can directly turn into revenue, with each repeated stream. This was corroborated by Anderson et al. (2021), showing that they can model a steady climb in Spotify followers over time, which directly leads to consistent increases in monthly listening hours, and (synonymously) royalty payouts. To back up their findings, they combined financial datasets from record labels with streaming data from Spotify's APIs to demonstrate that each additional 1,000 followers equates to incremental growth in monthly earnings. This insight reminds us that converting a fleeting interest like a quick view on TikTok into ongoing followership on a monetizable platform is crucial.

Follower metrics don't guarantee sales or streams unless driven by a well-orchestrated content ecosystem. Rahman et al. (2021) studied the case of two emerging artists who orchestrated cross platform campaigns to keep the momentum going. Through in-depth interviews with the artists' management teams

and an analysis of daily engagement metrics, the authors revealed that each platform served a distinct function: TikTok spikes generated short term viral visibility, YouTube delivered in depth storytelling and behind the scenes content, and Spotify enabled new listeners to get into a more habitual streaming pattern. Sponsored by the same group, working together over time in a carefully managed synergy, converted into a stable follower gain across the different platforms.

Similar results were found by Miller et al. (2019) when they studied how interactions transition from ephemeral social media interactions to more durable streaming behaviors. In a survey of 500 fans, 65% said they started following artists on Spotify for easier replay after discovering them on Instagram or TikTok first. The funnel like nature of modern music marketing is seen in this trajectory from ephemeral content to a dedicated follow on a streaming service. The most important feature is the ability to convert casual clicks into repeat, loyal listenership (Smith et al., 2020).

Taken together, the literature confirms that digital music performance is a multi-layered construct comprising content quality, audience interaction and the development of loyal followers. In the short term, artists can achieve broad reach through deploying creative, platform tailored content and stimulating interactions that feed into the algorithms. Yet, they can only generate a sustainable revenue stream and long-term career growth by converting these ephemeral engagements into sustained followership on streaming platforms (Zhao & Kim, 2021).

2.4. Research Gap and Hypotheses

While digital platforms have profoundly impacted the music industry, research has yet to fully explore how platform-specific dynamics influence music group performance, especially for K-pop. Most studies focus on general digital marketing or single platforms, with limited analysis of the combined effects of multiple platforms and their engagement metrics. Additionally, the time-lag effects

of digital engagement on measurable success remain underexplored, hindering a comprehensive understanding of how engagement translates into performance outcomes in diverse global markets.

This gap is filled by the current research, which investigates the differential impact of different platforms, the time lag effects of engagement activities, and the intricate interplay between content, interactions, and follower metrics in determining performance outcomes for K-pop groups. The study fills the gaps in the knowledge of the digital music landscape and provides practical marketing strategies for artists and industry professionals in the digital music field.

Based on these identified research gaps, the following hypotheses are proposed:

Hypothesis 1 (H1): K-pop groups perform quite differently across different digital platforms and each of these platforms presents different levels of engagement and performance outcomes.

Hypothesis 2 (H2): Digital engagement activities have time lag effects on performance outcomes (i.e., streaming, views, and followers), in that short term engagement does not necessarily translate into long term performance success.

Hypothesis 3 (H3): The cumulative and significant impact of content quality, user interactions, and follower growth on K-pop groups' digital performance is found, with follower metrics on content platforms having a stronger effect than social media interactions alone.

CHAPTER 3: METHODOLOGY

3.1. Research Design

In this study, a comprehensive quantitative research design is used, whereby regression analysis and Structural Equation Modeling (SEM) are employed to investigate the relationships between digital platform engagement metrics and K-pop group performance outcomes. In this research, the quantitative approach is most appropriate because it makes it possible to measure and analyze statistically various variables, to identify which variables are significant predictors and to quantify how much they affect dependent variables like streaming counts and view metrics. The study uses regression analysis to discover the direct effects of multiple independent variables (engagement metrics, follower counts, and interactions) on key performance indicators. Meanwhile, SEM is employed to dig deeper inside the complex causal pathways and mediating variables that link the variables, thereby advancing our holism of the nexus of causal mechanism underlying the performance outcomes.

This research design aims to delineate the differential effects of platform specific engagement, analyze and identify time lagged relationships, and to examine the combined effect of content quality, interactions, and follower metrics on the K-pop group performance. The design of this study is multifaceted, ensuring that not only are immediate influences identified, but that the delayed effects necessary to understand long term performance trends are captured as well. The research framework categorizes 14 variables into four distinct groups to allow for a nuanced analysis of how each dimension contributes to overall performance. The strength and significance of these relationships are then identified and quantified by employing regression analysis, and the causal pathways as well as the potential mediating variables affecting performance outcomes are explored further by utilizing SEM. Through this dual method approach, the study increases the power to produce actionable insights that K pop groups and their management teams can

use to optimize their digital strategies and maximize their global performance and market presence.

3.2. Data Collection

3.2.1. Data source and selecting a sample

The sample comprises weekly metrics from nine globally acclaimed K-pop groups: aespa, ITZY, LE SSERAFIM, NewJeans, Red Velvet, (G)I-DLE, NMIXX, and BLACKPINK. The groups were chosen strategically because they have a large digital presence, a global fan base, and use multiple digital platforms to promote globally. To ensure that study findings can be generalized and are applicable for other major acts of the K-pop industry, the study focuses on these influential groups. In addition, this selection provides important information that can help you run a successful digital marketing campaign.

Table 3-1. Basic Information of Nine K-pop Groups

Group Name	Debut Date	Agency	Music Style	Concept Positioning	Number of Members	Average Age * til 2025	Representative Songs	Overseas Popularity Regions
TWICE	2015-10-20	JYP	K-pop Dance-pop	"Cute" and "Lively"	9	27	"Cheer Up", "TT", "Fancy"	Japan, Southeast Asia, North America
BLACKPINK	2016-08-08	YG	K-pop Hip-hop EDM	"Girl Crush"	4	28	"Ddu-Du Ddu-Du" "Kill This Love"	North America, Europe, Southeast Asia
LE SSERAFIM	2022-05-02	Source Music (HYBE)	K-pop	"Fearless" and "Confident"	5	21	"Fearless", "Antifragile"	Japan, Southeast Asia
ITZY	2019-02-12	JYP	K-pop Dance-pop	"Girl Crush" and "Teen Crush"	5	23	"Dalla Dalla", "Wannabe"	Southeast Asia, North America
NMIXX	2022-02-22	JYP	K-pop Experimental	"Mixx Pop"	6	20	"O.O", "Dice"	Southeast Asia
Red Velvet	2014-08-01	SM	K-pop R&B Funk	"Dual Concept" "Red" - bright "Velvet" - mature	5	29	"Bad Boy", "Psycho"	North America, Europe, Southeast Asia
(G)I-DLE	2018-05-02	Cube	K-pop Hip-hop	"Self-producing" and "Unique"	5	26	"Latata", "Tomboy", "Nxde"	Southeast Asia, North America
aespa	2020-11-17	SM	K-pop Electropop	"Virtual Reality" and "Futuristic"	4	23	"Next Level", "Savage"	North America, Southeast Asia
NewJeans	2022-07-22	ADOR (HYBE)	K-pop R&B	"Youthful" and "Trendy"	5	19	"Attention", "Hype Boy"	Southeast Asia, North America

Source: Kprofiles

A comparative overview of these nine groups is given in Table 3-1, which

provides key information such as company affiliation, debut year, group size and musical styles. Take for example: TWICE and ITZY are from JYP Entertainment while a BLACKPINK is with YG Entertainment. Among these groups is a variety of music styles, whether BLACKPINK's hip hop influences, aespa's electropop and EDM focus according to The Herald's Jeong Seonhae, or the retro dance style and country influences preferred by RED VELVET. The characteristics of each group are presented in this foundational information, providing context for the analysis of their digital strategies.

3.2.2. Data Period

The dataset covers each group's debut until July 31, 2024, with weekly observations for multiple years. By offering this extensive timeline, it's possible to examine both short term fluctuations and long-term trends in engagement and performance, giving an all-encompassing view of how digital strategies evolve and influence outcomes over time. To find a good balance between granularity and manageability, I chose weekly intervals as the unit of analysis. The frequency of this data capture is high enough to capture timely changes in engagement metrics, without being so high as to be overwhelmed by unnecessary detail, allowing for meaningful statistical analysis and trend identification.

3.2.3. Variable Explanation

Table 3-2. Multiple Regression Coefficients for Predicting Views

V1	Youtube Channel Views	Weekly changes of the views of the Official YouTube Channel
V2	Youtube Video Views	Weekly changes of the views of all YouTube videos related to the artist
V3	Padora Streams	Weekly changes of the Pandora streams
V4	Sound Cloud Streams	Weekly changes of the Sound Cloud streams
I1	TikTok Likes	Weekly changes of the TikTok likes
I2	Facebook Talks	Weekly changes of the Facebook Talks
I3	Line Music Artist Likes	Weekly changes of the Line Music Artist Likes
Fc1	Youtube Subscribers	Weekly changes of the Youtube Subscribers
Fc2	Sound Cloud Followers	Weekly changes of the Sound Cloud Followers
Fc3	Melon Fans	Weekly changes of the melon Fans
Fc4	Spotify Followers	Weekly changes of the Spotify Followers
Fs1	Instagram Followers	Weekly changes of the Instagram Followers
Fs2	X(Twitter) Followers	Weekly changes of the X(Twitter) Followers
Fs3	TikTok Followers	Weekly changes of the TikTok Followers

Source: Compiled by the author

Table 3-2 provides a detailed overview of the variables used in this study, categorized into four key dimensions: This includes view metrics, interaction metrics, follower metrics and social media follower metrics. These are variables that we should track on a weekly basis to see the change of performance of the selected K-pop groups and across digital platforms. Below is an explanation of each variable and its significance:

View Metrics (V): The view metrics measure the visibility and streaming performance of groups on major platforms.

- V1: This variable measures the changes in number of views of those in the group's official YouTube channel each week as a direct read on the visibility and reach of the group's content on the platform.

- V2: It tracks the weekly changes in views of all YouTube videos about the artist, including fan made and collaborative content and shows how this broader ecosystem of visibility works.
- V3: Weekly changes in Pandora streams are focused on, which represents the group's reach on this widely used audio streaming platform, especially in the U.S.
- V4: Weekly changes in SoundCloud streams represents the group's performance among independent music consumers and creators.

Interaction Metrics (I): Audience engagement with the group's content across platforms is measured by interaction metrics.

- I1: It tracks weekly changes in TikTok likes to see how well short form video content is resonating with audiences and trends.
- I2: It monitors weekly changes in Facebook 'talks' – comments, shares and discussions on the platform related to the group – capturing community engagement on the platform.
- I3: It measures weekly changes in Line Music artist likes, the group's popularity on Japan's leading music platform, which is integrated into the popular messaging app, Line.

Follower Metrics (Fc): Fanbase growth on streaming and subscription-based platforms are what follower metrics measure.

- Fc1: It tracks weekly changes in YouTube subscribers, a direct measure of growing interest in the group's official content.
- Fc2: Indicates the group's reach for fans of independent and experimental music, represents weekly changes in SoundCloud followers.
- Fc3: It tracks weekly changes in Melon fans, which measures the group's performance on South Korea's largest music streaming platform.
- Fc4: It highlights weekly changes in the group's Spotify followers, which represent the group's global streaming audience growth and long-term

fan commitment.

Fs: Social Media Follower Metrics: Audience growth on visually and text-oriented platforms are captured by social media follower metrics.

- Fs1: They monitor weekly changes in Instagram followers to show how the group connects with audiences through visual storytelling and highly curated posts.
- Fs2: Follows weekly changes in X (formerly Twitter) followers, focusing on the group's engagement in real time discussions and fan interactions.
- Fs3: It represents weekly changes in TikTok followers and shows how the group is appealing to short form, trend driven video formats.

These metrics and their definitions are arranged according to Table 3-2 to allow for better understanding of the study's variables and how they are used to measure digital performance. This breakdown caters to each platform's characteristic, plus it provides complete insights into how these K-pop groups utilizing their strategies.

3.2.4. Variable Categorization

The 14 variables are categorized into four groups, which are four different dimensions of digital engagement and performance metrics. That categorization is vitally important for two reasons: in order to cluster variables so as to be consistent with the study objectives and be able to analyze them in a complete manner. The groups are as follows:

Table 3-3. Variables Categorization

Group 1				Group 2		
V1	V2	V3	V4	I1	I2	I3
Youtube Channel Views	Youtube Video Views	Padora Streams	Sound Cloud Streams	TikTok Likes	Facebook Talks	Line Music Artist Likes
V : Views and Plays on Contents platform				I : Interaction on Platforms		
Dependent variable (Contribute to Proceeds)				Independent variable (Not contribute to Proceeds)		
Group 3				Group 4		
Fc1	Fc2	Fc3	Fc4	Fs1	Fs2	Fs3
Youtube Subscribers	Sound Cloud Followers	Melon Fans	Spotify Followers	Instagram Followers	X(Twitter) Followers	TikTok Followers
Fc : Followers on Contents Platform				Fs : Followers on SNS Platform		
Independent variable (Not contribute to Proceeds)				Independent variable (Not contribute to Proceeds)		

Source: Compiled by the author

Group 1: Dependent variables: Views and Plays on Content Platforms.

V1: YouTube Channel Views

V2: YouTube Video Views

V3: Pandora Streams

V4: SoundCloud Streams

These are dependent variables that measure audience engagement on key streaming and content platforms that add directly to the groups' revenue and visibility. The study tracks views and plays to measure the instantaneous impact of digital strategies on performance.

Group 2: The Independent Variables are Interactions on Platforms.

I1: TikTok Likes

I2: Facebook Talks

I3: Line Music Artist Likes

These are independent variables, which are user interactions on different platforms, and can be used as potential predictors of the performance outcomes.

Likes, and talks, maximize audience engagement and interest, which affect streaming and view metrics.

Group 3: Content Platforms followers (Independent variables)

Fc1: YouTube Subscribers

Fc2: SoundCloud Followers

Fc3: Melon Fans

Fc4: Spotify Followers

Long term audience loyalty and revenue generation potential on content platforms are measured by follower counts. The first variables monitored for growth and retention of followers, which gives insights into the sustainability of digital strategies.

Group 4: Social Media Platforms Followers (Independent Variables)

Fs1: Instagram Followers

Fs2: Twitter Followers

Fs3: TikTok Followers

The broader digital footprint of the 'K-pop' groups is represented by followers on social media platform. Understanding the relationship between social media presence and content platform performance requires these metrics.

Group 1 dependent variables are directly related to proceeds by measuring audience engagement on streaming and content platforms. Groups 2, 3, and 4 have independent variables that are different dimensions of user engagement and follower dynamics, which may be possible predictors of performance. This structured categorization enables in depth analysis of how different engagement metrics affect the performance outcomes of K-pop groups in different digital platforms.

3.3. Analytical Methods

3.3.1. Regression Analysis

The cornerstone of the analytical method of this study is regression analysis, which is the primary tool to study the relationships between independent and dependent variables. This is a method well suited to identify important predictors and quantify their relative impact on performance outcome. The study employs two distinct regression models: models of the Concurrent Effects Model and the Time-Lagged Effects Model.

The Concurrent Effects Model concentrates on the concurrent relationships and looks at the immediate impact of engagement metrics on performance outcomes. This model analyzes real time data to provide insights into which platform specific metrics drive short term performance. Take, for example, if YouTube video views spike right after we've got a spike in TikTok likes, you can quantify and understand how much impact the TikTok engagement had on the YouTube performance.

To capture such delayed effects, the Time Lagged Effects Model adds a one-week lag to the regression models. On platforms like TikTok or Instagram engaging activities may build over time, and convert into actual Spotify streams and YouTube views. Additionally, by including lagged variables in the models, the study shows how initial engagement metrics impacts performance metrics over some predefined amount of time providing more granular timelines for the relationships.

Regression models are built to see how various independent variables affect the dependent variables without having to use mathematical formulas. The regression coefficients, p values and the adjusted R squared values are computed using statistical software such as SPSS/R, etc. These metrics guarantee a robust interpretation of the results: they determine which independent variable

significantly predicts the performance outcome, and to what degree it is explained by, the dependent variable. In addition, interaction terms can be added to model the aggregated effects of multiple engagement metrics towards performance outcomes.

3.3.2. *Structural Equation Modeling (SEM)*

In this study, Structural Equation Modeling (SEM) was used in addition to regression analysis to better understand the complex relationships between digital engagement metrics and performance outcomes. Regression analysis identifies linear relationships among independent and dependent variables, but SEM permits studying several interdependent relationships, either direct or indirect, together. As such, SEM is well suited to the study of multi dimensional interactions between different digital platforms that shape K-pop group performance.

SEM is used in this research because it can model latent variables and identify mediating effects, giving a holistic picture of how engagement metrics jointly lead to performance outcomes. Ultimately SEM allows incorporating all DVs and engagement metrics from various platforms into a single framework to provide insight into how different kinds of digital engagement interact on each other and overall performance.

In this study, SEM was structured around three key features:

1. **Path Analysis:** Direct relationships between independent variables (e.g., TikTok Likes, Instagram Followers) and dependent variables (e.g., YouTube Views, Spotify Streams) were mapped and quantified using SEM. This allowed us to visualize how engagement metrics on one platform can directly impact performance outcomes on another. For example, TikTok Likes did have a significant, positive effect on YouTube Views, and, via delivery of increased Instagram engagement, indirectly affected Spotify Followers.
2. **Latent Variables:** Latent variables like 'content engagement' and

'audience loyalty' were constructed as latent variables inferred from measurable indicators such as YouTube Views and TikTok Likes. This enabled the study to take into account underlying dimensions of digital engagement that are not directly observable, but are key to understanding performance outcomes.

3. **Mediation Analysis:** SEM revealed how some variables mediate the relationship between engagement metrics and performance outcomes. For example, the model showed that social media interactions (e.g., TikTok Likes) are mediated by Spotify Followers in their relationship with streaming performance. This means if you get more TikTok Likes, you will get more Instagram Followers, which will then lead to more Spotify Streams.

SEM analysis showed that content platform followers (e.g., YouTube Subscribers, Spotify Followers) had significantly greater and more positive impact on performance outcomes than social media interactions (e.g., TikTok Likes) and social media followers (e.g., Instagram Followers). Interestingly, content platform followers had positive relationships but social media follower growth (Fs) had a negative or weaker relationship than other engagement metrics. It appears that having more social media followers does not necessarily lead to streaming success, and that there may be a need for cross platform strategies to turn visibility into measurable outcomes.

To validate the SEM model, several fit indices were employed:

- **Comparative Fit Index (CFI):** This index compares the fit of a model specified to the fit of the baseline model. We find good fit when values exceed 0.90.
- **Root Mean Square Error of Approximation (RMSEA):** It measures the model's approximation error and will be good fit if the value is below 0.08.

- **Standardized Root Mean Residual (SRMR):** Standardized differences between observed and predicted correlations are evaluated, and values below 0.05 indicate an excellent fit.

Combining SEM with regression analysis helps the study to better approximate how digital engagement metrics actually drive Kpop group performance. SEM is able to model complex causal relationships and mediation effects to give a comprehensive understanding of how particular engagement strategies affect long term performance outcomes. The dual approach analysis helps K-pop agencies and marketers to develop more effective strategies to maximize cross platform engagement in the highly competitive global music industry.

3.4. Data Preparation and Analysis Procedures

The first important step to assure the integrity and reliability of the dataset is Data Cleaning. Missing values and outliers need to be addressed in this process that tends to skew the analysis. The extent and pattern of missingness dictates techniques of handling these missing data. Statistical techniques such as Z-scores or Interquartile Range (IQR) we used to identify outliers and transformed or excluded those from the results. Furthermore, data normalization is executed to make the variables comparable across varying metrics and platforms.

In order to improve the analysis, Weekly Changes in Variables are calculated. This is done by computing week over week percentage change for each variable, which captures the dynamics of engagement and performance. Standardizing the dataset in this way allows the study to more easily identify trends and patterns that develop over time, and thus perform a more granular analysis of how short-term fluctuations translate into long term performance outcomes.

All variables are computed for Descriptive Statistics to give an overview of central tendencies and variability in the dataset. The first insight to the distribution

and dispersion of the metrics are given by measures such as means, medians, standard deviations and ranges. Baseline performance levels and the overall landscape of digital engagement across different platforms is identified through descriptive analysis, which serves as a prelude to more detailed inferential analyses.

The initial relationship of variables is identified using Correlation Analysis. To figure out if there are any associations between certain independent variables (e.g., TikTok Likes, Instagram Followers) and dependent variables (e.g., YouTube Views, Spotify Streams) we calculate Pearson correlation coefficients to see the strength and direction of those. This is a necessary step, because the multicollinearity issues can be detected in this step, and it also guides the choice of predictors for the subsequent regression model(s). Techniques employed to handle high correlations among independent variables include Variance Inflation Factor (VIF) analysis to check the robustness of resulting regression outputs.

Concurrent and time lagged Regression Analysis is applied to capture the immediate and delayed effects of engagement metrics on performance outcomes. The concurrent models measure the real time impact, and the time lagged models measure the temporal dynamics and how initial engagement affects performance metrics after a time period. Each predictor is determined both by their significance (interpreted by the regression coefficients, p-values, and the adjusted R-squared value) and explanatory power. Also, interaction terms may be included to examine the impact of the joint effect of multiple engagement metrics on the performance outcomes, whereby a more comprehensive data analysis is carried out.

Specialized software such as AMOS is used to run Structural Equation Modeling (SEM). Specifying the hypothesized relationships among variables, estimating the model parameters and the model fit using fit indices such as CFI, RMSEA and SRMR are part of the modeling process. SEM analysis gives a holistic picture of both the direct and indirect effects and explains how engagement metrics influence performance outcomes. Further, mechanisms that drive these

relationships are further elucidated through mediation and moderation analyses within SEM, and how different dimensions of digital engagement interact to impact long term performance is explored.

Analytical Methods Integration is a thorough examination of data from multiple points of view. The method of straightforward insight into direct relations between variables proposed in regression analysis seems realized, whereas interdependencies, causal paths in them are revealed with the help of SEM. The broader analytical approach of this study enables more nuanced findings to be made regarding how digital engagement strategies impact performance across different digital platforms. The study combines these methods to validate findings across different analytical frameworks in order to increase the robustness and credibility of the results.

Validation and Reliability Testing are needed to have right and reasonably correct findings. Internal consistency is assessed in terms of Cronbach's alpha for latent constructs with values more than 0.7 acceptable. Within the SEM framework, Confirmatory Factor Analysis (CFA) is performed to validate the measurement model, i.e., the observed variables measure the underlying latent constructs. Moreover, cross validation methods are used to examine the generalizability of the regression and SEM models, controlling potential overfit and strengthening its conclusions. The validation of these study findings is crucial in demonstrating the reliability of these findings for use in a digital marketing strategy in K-pop industry.

The data collection and analysis process adheres to ethical guidelines. All data used are publicly available and aggregated from Chartmetric, ensuring individual privacy protection. The study excludes personally identifiable information, relying solely on aggregate performance metrics. Honest and accurate reporting, free from manipulation, is a key ethical consideration, preserving research integrity. By upholding academic honesty and high ethical standards, the study ensures the credibility and reliability of its findings.

CHAPTER 4: RESULTS OF ANALYSIS

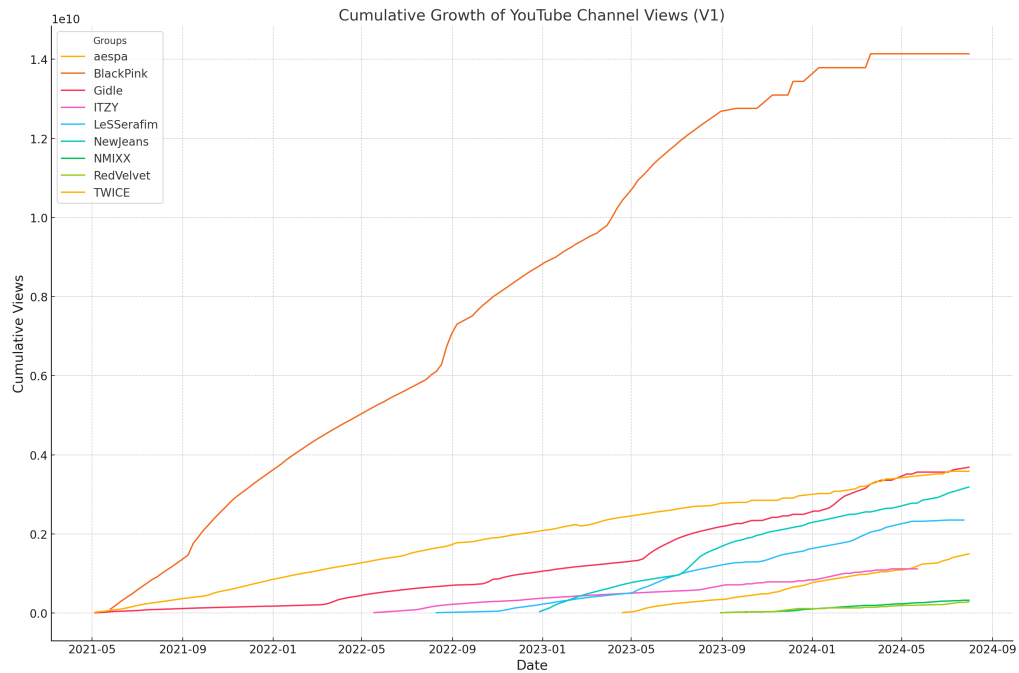
4.1. Cumulative Trends Analysis

This research collected data on 14 performance variables for 9 K-pop groups. Each variable represents weekly performance metrics recorded on various platforms, spanning the period from each group's debut until July 31, 2024. The dataset captures the cumulative growth trends across platforms such as YouTube, TikTok, Instagram, Spotify, and others, offering insights into the dynamics of audience engagement over time.

To illustrate these trends, four representative variables were selected for visualization and analysis. The selection criteria focused on choosing the first dataset from each major category: "V1: YouTube Channel Views," "I1: TikTok Likes," "Fc1: YouTube Subscribers," and "Fs1: Instagram Followers." These variables were analyzed through time-series cumulative visualization, followed by an in-depth examination of their respective trends. This serves to highlight both the similarities and differences in growth patterns across platforms, providing a foundation for the comprehensive summary and analysis of all 14 variables that follows.

4.1.1. V1 for Youtube Channel Views

Figure 4-1. Cumulative Growth of YouTube Channel Views (V1)



Resource: Compiled by the author based on “Chartmetric”

Figure 4-1 illustrates the cumulative growth of YouTube channel views from May 2021 to September 2024 for nine K-pop groups: BLACKPINK, (G)I-DLE, aespa, ITZY, LE SSERAFIM, NewJeans, NMIXX, Red Velvet, and TWICE. On the x-axis is the date range, and y-axis shows cumulative views in billions, reaching a peak near 14 billion. For clarity, each group is represented by a different color.

BLACKPINK leads by a significant margin, exceeding 14 billion views by the end of the timeline. Their growth has been rapid and consistent, especially from mid-2021 to early 2023, securing a dominant position with strong audience engagement. TWICE follows with around 8 billion views, also growing but at a slower pace.

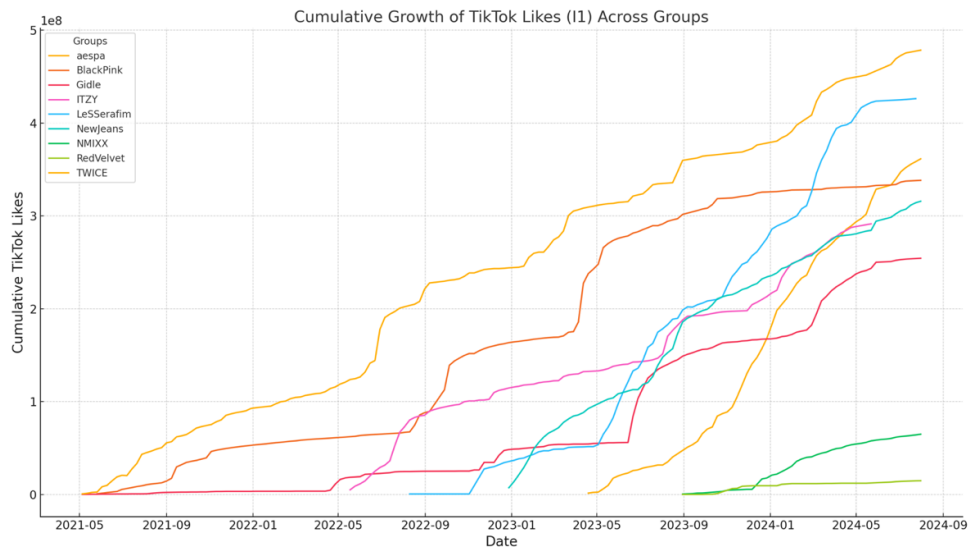
While emerging groups like NewJeans and LE SSERAFIM have arrived late

to the K-pop scene, they're demonstrably doing well, skyrocketing in popularity. In the middle ground, we have groups such as aespa, ITZY and Red Velvet who have made steady, but not huge, progress with cumulative views between 2 and 4 billion. 3 billion and rising, (G)I-DLE is seeing a rise in fan engagement. On the other hand, NMIXX's cumulative views are just over 1 billion, which represents comparatively little traction.

Key dynamics in the K-pop market are highlighted in this analysis. BLACKPINK and TWICE are ruling the roost, with BLACKPINK continuing to reign supreme. On the other hand, fast rising groups like NewJeans and LE SSERAFIM are making their way up quickly, indicating that they might be changing the order of the pecking order. aespa, ITZY, and Red Velvet retain its fan engagement, and NMIXX is unable to gain the same. In light of these findings, we saw glaring differences in the reach and growth rate of audiences who follow K-pop groups on a global platform like YouTube, as the industry continues to evolve.

4.1.2. II for TikTok Likes

Figure 4-2. Cumulative Growth of TikTok Likes (II)



Resource: Compiled by the author based on "Chartmetric"

In Figure 4-2, we can see the cumulative growth of TikTok likes for nine K-pop groups (aespa, BLACKPINK, (G)I-DLE, ITZY, LE SSERAFIM, NewJeans, NMIXX, Red Velvet and TWICE) from May 2021 to September 2024. The timeline is on the x-axis and cumulative likes up to 500 million are charted on the y-axis. Each line represents a group's performance over time, showing how their audience is engaging and how popular they are on TikTok.

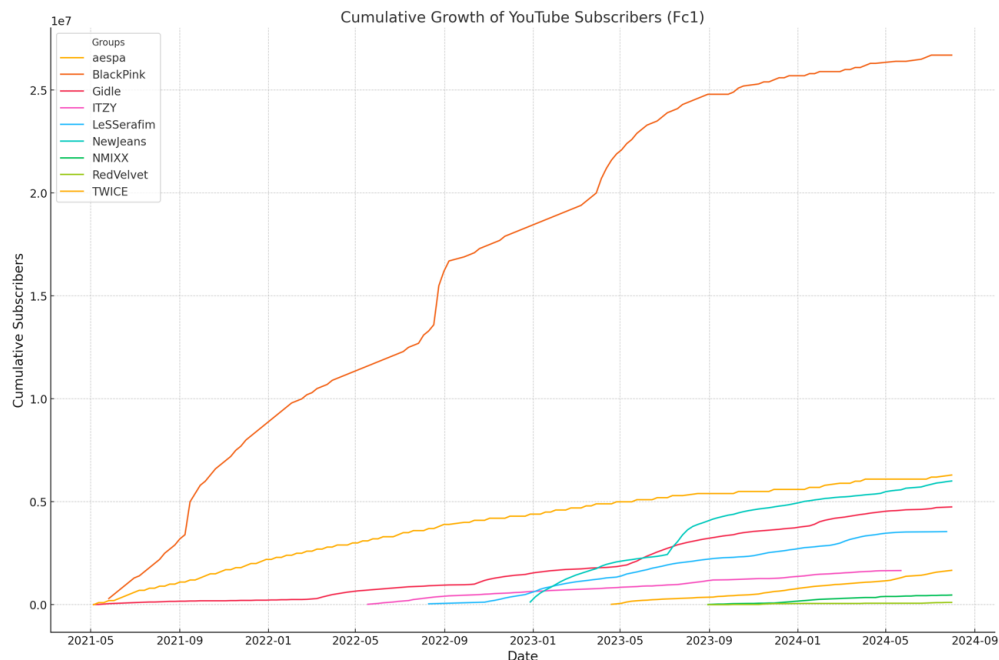
NewJeans shows the fastest and biggest growth, surpassing 500 million likes by late 2024. They spiked sharply, especially from mid-2022, which speaks to their exceptional resonance with younger, TikTok savvy audiences and their ability to use platform trends effectively. On the other hand, BLACKPINK, too, demonstrate robust growth along the timeline, racking up 450 million likes around the end of the timeline, with consistent presence across all platforms. In the same way, LE SSERAFIM shows an upward trend, especially from late 2022, approaching the level of other established groups and showing their growing competitive power.

On the other hand, TWICE, ITZY and aespa have a moderate but steady growth with their cumulative likes between 200 million and 300 million by September 2024. These groups exhibit consistent fan engagement, but they are not growing as quickly as newer competitors are. NMIXX is one of the least prominent emerging groups in terms of cumulative likes, but it's growing gradually, while (G)I-DLE is ahead of NMIXX, but it is also growing more slowly than NewJeans and LE SSERAFIM. However, Red Velvet records the least growth, and remains well below 100 million likes. This means either a narrow focus on TikTok or a less powerful strategy to use TikTok's audience dynamics.

From overall trends, it could be seen that TikTok’s platform nature is dynamic as well as an engagement reinvention area. BLACKPINK continues to dominate globally across platforms, but new groups like NewJeans and LE SSERAFIM are quickly becoming their rivals, using TikTok trends to quickly grow their digital footprint. On the other hand, well-known names like TWICE, ITZY and aespa can continue to persist as they already have but they might need to adapt their game to that of TikTok more closely in order to play to the fast-paced nature of the platform. However, groups like Red Velvet and NMIXX are underperformers, and the platform should be trying innovative strategic moves to make them noticeable and engaging enough on the channel.

4.1.3. Fc1 for YouTube Subscribers

Figure 4-3. Cumulative Growth of YouTube Subscribers (Fc1)



Resource: Compiled by the author based on “Chartmetric”

Figure 4-3 shows the cumulative growth of YouTube subscribers for nine K-pop groups (aespa, BLACKPINK, (G)I-DLE, ITZY, LE SSERAFIM, NewJeans, NMIXX, Red Velvet and TWICE) from May 2021 to September 2024. On the x-axis is time, and on the y-axis is the cumulative subscriber count in millions, with a maximum of just under 30 million. Each line represents the performance of a particular group, and tells us something about their fan engagement and digital popularity.

BLACKPINK ends the timeline with a commanding lead, having surpassed 28 million subscribers. The steep growth curve of these artists; especially from 2021–2022 sheds light on their massive global fanbase, and the strength of their content. Following behind TWICE is a steady second with a similar trajectory to 13 million subscribers. This also indicates that the fanbase is already set and going strong over time.

LE SSERAFIM and NewJeans show impressive growth in subscriber numbers, especially after 2022, for debuting later. It underscores the fact that they're popular, and have the tactics to effectively engage a YouTube audience. On the other hand, aespa, ITZY and Red Velvet show moderate growth to subscriber counts of between 4 million and 8 million by the end of the timeline. These groups have stable engagement, but grow more slowly than newer competitors, such as NewJeans.

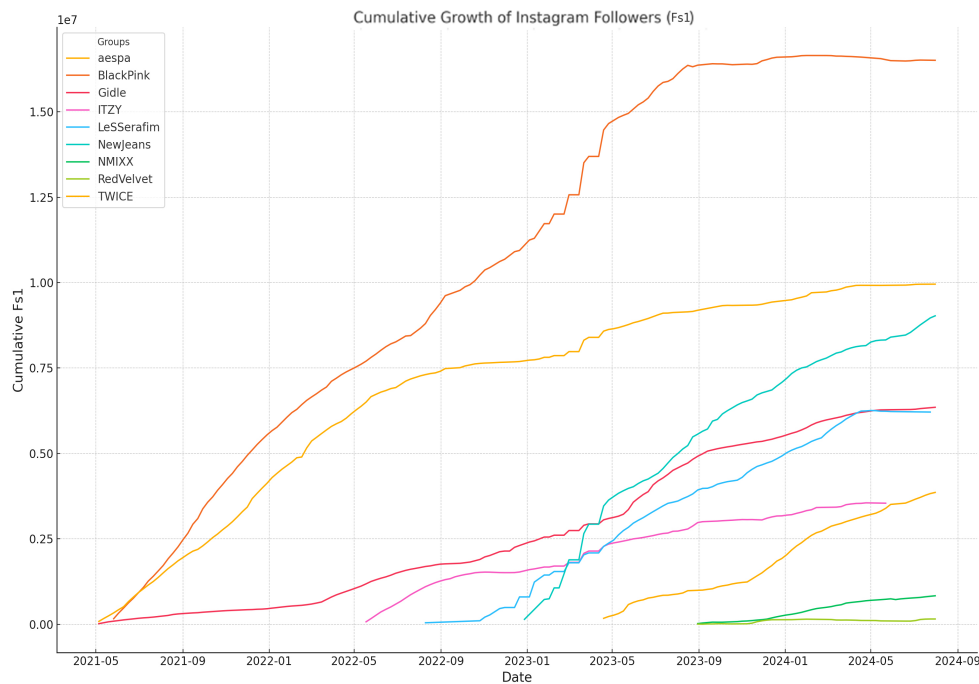
NMIXX does not show big growth and their YouTube subscriber growth is relatively flat line below 2 million, which suggests that its engagement with viewers is not good enough. (G)I-DLE on the other hand, has over 5 million subscribers opening up by 2024 and experiences steady though moderate growth. Their trajectory is stronger than NMIXX, but it's not as fast as BLACKPINK or NewJeans.

In Figure 4-3, we observe different dynamics across the groups. Meanwhile, BLACKPINK and TWICE solidify their status as market leaders, with

BLACKPINK way out in front as the most followed K pop group on YouTube. As rising powerhouses, NewJeans and LE SSERAFIM are fast catching up, and are threatening to eat into the market share of their older counterparts. Stable, but slower growth among mid-tier groups like aespa, ITZY, and Red Velvet has the potential to improve their YouTube content strategies. Last, it seems that NMIXX has not been performing as well as they could, indicating that they have yet to be as strong as they needed to be in the promotion department or the content department, in order to compete on the platform.

4.1.4. Fsl for Instagram Followers

Figure 4-4. Cumulative Growth of Instagram Followers (Fs1)



Resource: Compiled by the author based on “Chartmetric”

Figure 4-4 shows this number of users for nine K-pop groups (aespa, BLACKPINK, (G)I-DLE, ITZY, LE SSERAFIM, NewJeans, NMIXX, Red

Velvet, and TWICE) that used Instagram from May 2021 to September 2024. On the x-axis is the timeline, and on the y-axis is the cumulative follower count up to 50 million. The performance of each group is represented by a line, showing how engaged their audience is on Instagram.

With over 45 million followers by September 2024, BLACKPINK is clearly the platform's king or queen, displaying extremely consistent and high growth from the dates observed. In this, lies a testament to their unparalleled global influence and their ability to keep the engagement live with several segments of the audience. TWICE continues to climb steadily, with their Instagram followers now at around 35 million, indicating that they have a dedicated fanbase, and are a force to be reckoned with on Instagram. While they debuted later, NewJeans shows a steep growth curve, especially after 2023, and is approaching TWICE's follower count. It's no surprise that they have risen so rapidly, using Instagram to engage fans and grow their reach.

LE SSERAFIM also demonstrate growth, surpassing 30 million followers in 2024 and are a competitive force amongst newer groups. aespa, ITZY, (G)I-DLE, and Red Velvet all have moderate growth with follower counts from 15 million to 25 million. They keep steady engagement with their fanbases, but they're not growing as fast as BLACKPINK, TWICE, or NewJeans.

On the other hand, NMIXX trails far behind, only passing 5 million followers by the end of the timeline. That likely means they're slower growers on Instagram, and that their engagement or content strategies on the platform aren't as strong as other groups within the project.

Figure 4-4 shows the trends of the importance of Instagram as a platform for audience engagement. BLACKPINK's global appeal and staying power as

followers are consistent. Instagram's dynamics allow NewJeans and LE SSERAFIM to rapidly gain visibility and engage fans, as they show explosive growth. TWICE, aespa and ITZY, have a loyal fan following but might have to innovate to catch pace with the newer competition growing at a faster rate. The data also shows that for underperforming groups like NMIXX there are huge opportunities to improve their content strategy and promotional efforts on the platform.

4.1.5. Summary of all 14 variables of 9 K-pop Groups

This analysis integrates data from multiple platforms, including YouTube (channel views, video views, and subscribers), TikTok (likes and followers), Instagram, X (Twitter), Spotify, SoundCloud, Melon, Line Music, Pandora, and Facebook. Each metric captures a specific dimension of popularity and engagement. The nine K-pop groups under examination are aespa, BLACKPINK, (G)I-DLE, ITZY, LE SSERAFIM, NewJeans, NMIXX, Red Velvet, and TWICE.

1. BLACKPINK: Consistent Global Dominance

BLACKPINK outperforms across nearly all platforms. They have the highest cumulative metrics in YouTube subscribers, channel views, video views, TikTok likes, Spotify followers, and Instagram followers. Their trajectory indicates sustained global engagement, reflecting their established presence as one of the most influential K-pop groups. Their steep growth rates across platforms highlight effective cross-platform content strategies and a broad international fanbase.

2. TWICE: Steady Growth and Loyal Fanbase

TWICE demonstrates strong performance across YouTube, Instagram, and TikTok, with consistent growth in subscribers, followers, and likes. While their

growth is not as explosive as newer groups like NewJeans, their steady upward trajectory signifies a highly engaged and stable fanbase. This is particularly evident in YouTube subscribers and TikTok followers, where they rank among the top performers.

3. NewJeans and LE SSERAFIM: Rapid Ascension

NewJeans and LE SSERAFIM exhibit exponential growth on platforms such as TikTok, Instagram, and Spotify. Their rapid rise, despite later debuts, showcases their ability to capture attention through innovative content strategies and effective use of trend-driven platforms like TikTok. This is particularly notable in TikTok likes and followers, where their curves rival or surpass those of more established groups.

4. aespa, ITZY, and Red Velvet: Stable but Moderate Performance

These groups show consistent yet moderate growth on most platforms, including Instagram, TikTok, and YouTube. While their cumulative metrics are not as high as those of BLACKPINK or TWICE, their performance reflects a stable and loyal fanbase. Red Velvet's slower growth compared to peers suggests opportunities to enhance engagement strategies.

5. (G)I-DLE: Steady Growth with Focused Engagement

(G)I-DLE's performance is characterized by steady growth across platforms such as YouTube and TikTok, with cumulative metrics placing them in the mid-tier. Their upward trend highlights increasing fan engagement, though they remain behind the top-tier groups.

6. NMIXX: Limited Engagement Across Platforms

NMIXX consistently lags behind other groups in most metrics, including YouTube subscribers, TikTok followers, and Instagram likes. Their slower growth rates suggest challenges in establishing a strong presence, pointing to the need for more impactful content and strategic promotional efforts.

In channel views and subscribers, BLACKPINK and TWICE are at the top, and NewJeans and LE SSERAFIM are growing fast, indicating they are making good use of the platform's global reach, while aespa and ITZY are growing more slowly but steadily, showing they are maintaining their audience without the explosive growth seen in newer groups.

TikTok metrics show NewJeans and LE SSERAFIM as key players, with NewJeans topping the likes. BLACKPINK continues to do well, using its global reach to continue to keep fans interested. While some of TWICE's potential rise may reflect growth in newer groups' comparatively faster rise, it also illustrates Tik Tok's fickle nature: a taste for the tropically catchy, but only temporarily.

BLACKPINK leads the way on Instagram, followed by TWICE and NewJeans. LE SSERAFIM shows how Instagram's visual storytelling can help them expand their follower quickly. BLACKPINK and NewJeans clearly have international appeal with Spotify metrics with Western markets and TWICE and Red Velvet are building more slowly but steadily.

Legacy (I'll explain what that means later chapter later), groups like TWICE and Red Velvet still have highly dedicated fanbases on regional platforms like SoundCloud and Melon, whereas newer groups instead focus on global platforms. There are huge differences in Pandora and Line Music metrics, showing regional audience preferences.

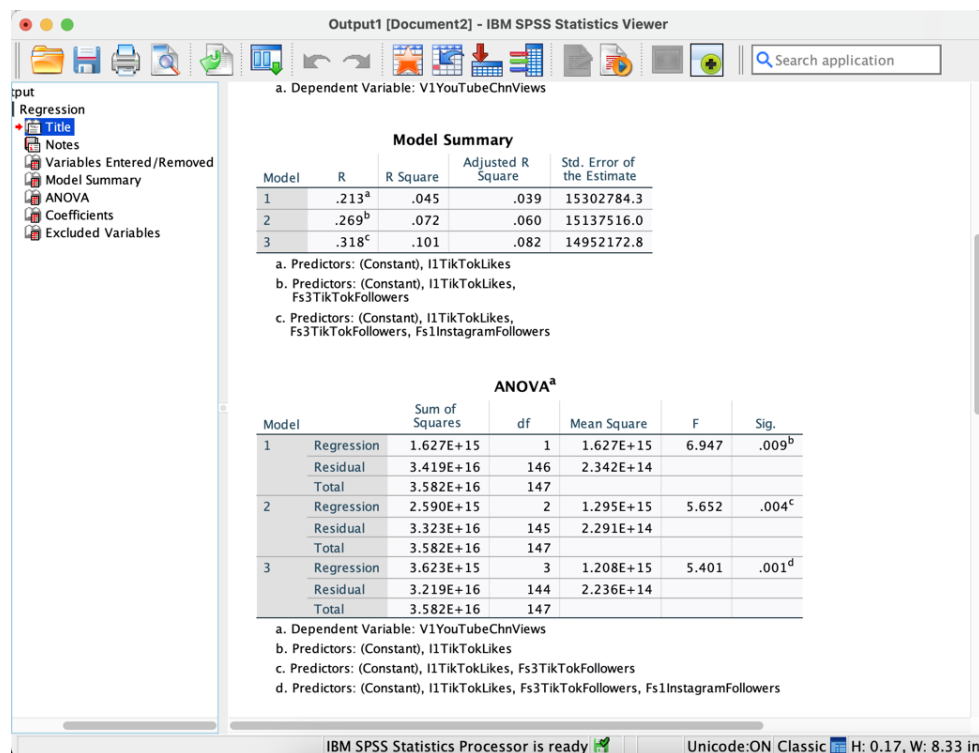
BLACKPINK continues to lead the pack globally, NewJeans and LE SSERAFIM continue to make their mark, while legends such as TWICE are maintaining their solid spots. At the same time, NMIXX struggles with visibility, underscoring the importance of more robust platform specific strategies.

4.2. Results of Regression Analysis

4.2.1. Results of the Regression Analysis (Concurrent Effect Model)

This study conducted a regression analysis using the stepwise method for 14 variables associated with nine K-pop groups. The findings were summarized into tables and figures. In this subsection, the regression results of the Concurrent Effect Model for four selected groups are presented as examples. The analysis begins with TWICE.

Figure 4-5. Output of IPSS's Linear Model



Resource: Compiled by the author

Three key indicators were regressed to evaluate the effectiveness and predictive power of the model. Second, emphasis was placed on the Adjusted R^2 as an important measure of model fit. Unlike the standard R^2 however, it takes into account the number of predictors in the model, thus providing a more stable measure, and thus choice, when more and more predictors are added to the model. This is important so that the explanatory power (i.e., the goodness of fit) of the model reflects reality, the true effectiveness, not aided by extraneous predictors.

The overall significance of the regression model was then evaluated by using the F-value. This statistic simply tells you whether one or more of the independent variables actually explain some meaningful proportion of the variance in the dependent variable. High F-value indicates that the model represents the main relationships between the predictors and outcome which encourages the usage of this model to analyse complex dataset.

Lastly, Prob F (Sig.) was checked for statistical significance of F-test. This p value determines whether the observed model fit is much better than a baseline, or intercept only model. The robustness of the regression results is reinforced with a p-value below 0.05, indicating that the predictors, as a group, explain the dependent variable.

Taken together, these indicators combine into a measure of the whole evaluation model and emerge as an all-encompassing summary of the regression model with regard to fit, significance, and reliability. The approach is multi-faceted, ensuring that the findings are statistically rigorous and practically meaningful.

Table 4-1. Multiple Regression Coefficients for Predicting YouTube Channel Views

Coefficients ^a						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	21559188.1	1608945.240		13.400	<.001
	I1TikTokLikes	.818	.310	.213	2.636	.009
2	(Constant)	23910043.6	1961438.389		12.190	<.001
	I1TikTokLikes	1.136	.344	.296	3.303	.001
	Fs3TikTokFollowers	-36.572	17.834	-.184	-2.051	.042
3	(Constant)	21516352.4	2234861.860		9.628	<.001
	I1TikTokLikes	1.221	.342	.318	3.570	<.001
	Fs3TikTokFollowers	-48.267	18.437	-.243	-2.618	.010
	Fs1InstagramFollowers	47.595	22.150	.178	2.149	.033

a. Dependent Variable: V1YouTubeChnViews

Resource: Compiled by the author

In addition to these indicators, this study paid special attention to the Standardized Coefficients Beta, which measures the strength and direction of the relationship between each independent variable and the dependent variable. Standardized coefficients allow for comparisons across predictors by removing the influence of variable units.

Table 4-2. The result of Concurrent effect model <TWICE>

Concurrent Effect Model		Dependent Variables			
		Youtube Channel Views	Youtube Video Views	Pandora Streams	Sound Cloud Streams
		V1	V2	V3	V4
Adjusted R2		0.082	0.699	0.000	0.301
F		5.4	69.2	0.0	13.7
Prob F		0.001	0.001	-	0.001
TikTok Likes	I1	0.318	0.176		0.165
Facebook Likes	I2				
Line Music Artist Likes	I3		0.139		0.310
Youtube Subscribers	Fc1		0.126		
Sound Cloud Followers	Fc2		0.161		
Melon Fans	Fc3				-0.195
Spotify Followers	Fc4				0.275
Instagram Followers	Fs1	0.178			
X(Twitter) Followers	Fs2		0.572		
TikTok Followers	Fs3	-0.243			-0.249

Resource: Compiled by the author

The Standardized Coefficients Beta values in the matrix in table 4-2 show the relationships between 10 independent variables and 4 dependent variables. A key finding is that the impact of various predictors on performance outcomes is platform specific.

In YouTube Channel Views (V1), we find TikTok Likes (I1) to have a substantial positive effect (Beta = 0.318), suggesting that TikTok engagement has a cross platform effect on YouTube. For YouTube Video Views (V2), Instagram Followers (Fs1) again comes out as the best predictor (Beta = 0.572) the effect of Instagram on video watching.

On the other hand, for Pandora Streams (V3), low Beta values and Adjusted R² indicated no significant predictors, meaning that there was little external impact on this platform. In the case of SoundCloud Streams (V4), SoundCloud Followers (Fc2) have a moderate positive effect (Beta = 0.275) highlighting the reliance of the platform on its own follower base for performance improvement.

Finally, these results demonstrate the importance of platform specific metrics,

where TikTok and Instagram are important drivers for visual platforms, while SoundCloud metrics are still relevant within its own ecosystem.

Table 4-3. The result of Concurrent effect model <BLACKPINK>

Concurrent Effect Model		Dependent Variables			
		Youtube Channel Views	Youtube Video Views	Pandora Streams	Sound Cloud Streams
		V1	V2	V3	V4
Adjusted R2		0.442	0.884	0.043	0.411
F		40.1	225.7	4.3	21.7
Prob F		0.001	0.001	0.015	0.001
TikTok Likes	I1	0.183		-0.567	-0.348
Facebook Likes	I2				
Line Music Artist Likes	I3				
Youtube Subscribers	Fc1	0.414	0.563		-0.318
Sound Cloud Followers	Fc2		0.245		0.307
Melon Fans	Fc3				
Spotify Followers	Fc4		0.079		0.313
Instagram Followers	Fs1				
X(Twitter) Followers	Fs2	0.235	0.163		
TikTok Followers	Fs3		0.163	0.615	0.680

Resource: Compiled by the author

Key predictors that drive performance metrics in BLACKPINK are shown to have cross platform impact in table 4-3. In the case of YouTube Channel Views (V1) and YouTube Video Views (V2), YouTube Subscribers (Fc1) was the strongest influence with Beta values of 0.414 and 0.563, respectively. This highlights the importance of subscriber count in determining both video performance at the channel level and at the level of individual videos.

TikTok Followers (Fs3) had the most impact for streaming platforms. On Pandora Streams (V3), Fs3 was 0.615, meaning TikTok could funnel engagement to audio platforms. For SoundCloud Streams (V4), Fs3 also had a very strong effect, with a Beta value of 0.680, highlighting the importance of TikTok for the SoundCloud performance.

These results emphasize the strategic value of utilizing YouTube Subscribers

to boost visual content performance and TikTok Followers to boost streaming results for BLACKPINK, demonstrating the efficacy of cross platform audience engagement tactics.

Table 4-4. The result of Concurrent effect model <LE SSERAFIM>

Concurrent Effect Model		Dependent Variables			
		Youtube Channel Views	Youtube Video Views	Pandora Streams	Sound Cloud Streams
		V1	V2	V3	V4
Adjusted R2		0.636	0.736	0.121	0.000
F		51.2	48.9	12.8	0.0
Prob F		0.001	0.001	0.001	-
TikTok Likes	I1	0.462			
Facebook Likes	I2				
Line Music Artist Likes	I3				
Youtube Subscribers	Fc1	0.513	0.710	0.362	
Sound Cloud Followers	Fc2		0.151		
Melon Fans	Fc3		0.432		
Spotify Followers	Fc4		0.140		
Instagram Followers	Fs1	-0.302	-0.644		
X(Twitter) Followers	Fs2				
TikTok Followers	Fs3				

Resource: Compiled by the author

The key predictors of platform performance for LE SSERAFIM, as shown in Table 4-4, are audience metrics across platforms. YouTube Subscribers (Fc1) was found to be the most influential predictor for YouTube Channel Views (V1) and YouTube Video Views (V2) with Beta values of 0.513 and 0.710 respectively. In doing so, this reinforces the importance of subscriber growth to increasing overall channel views, as well as individual video performance.

TikTok Likes (I1) had a positive response on Pandora Streams (V3) with a Beta value of 0.462, providing proven crossplatform engagement between TikTok and Pandora on streaming platforms. SoundCloud Followers (Fc2) had a moderate

positive effect for SoundCloud Streams (V4) (Beta = 0.362) indicating a dedicated SoundCloud audience is important for SoundCloud performance.

These results highlight the dual power of YouTube Subscribers to drive visual content success and TikTok engagement to boost streaming metrics. Moreover, ecosystem specific metrics such as SoundCloud Followers have continued to be important for maintaining engagement within certain ecosystems.

Table 4-5. The result of Concurrent effect model <ITZY>

Concurrent Effect Model		Dependent Variables			
		Youtube Channel Views	Youtube Video Views	Pandora Streams	Sound Cloud Streams
		V1	V2	V3	V4
Adjusted R2		0.251	0.812	0.000	0.426
F		17.8	109.1	0.0	75.1
Prob F		0.001	0.001	-	0.001
TikTok Likes	I1	0.578	0.169		
Facebook Likes	I2				
Line Music Artist Likes	I3				
Youtube Subscribers	Fc1				
Sound Cloud Followers	Fc2				
Melon Fans	Fc3		0.763		
Spotify Followers	Fc4				0.657
Instagram Followers	Fs1				
X(Twitter) Followers	Fs2		0.137		
TikTok Followers	Fs3	-0.247	-0.105		

Resource: Compiled by the author

Table 4-5 emphasizes the cross-platform influence on ITZY's digital performance and the significance of audience engagement and platform specific metrics. It is found that the TikTok Likes (I1) has the strongest relationship to predict the YouTube Channel Views (V1) in the first step with a Beta value of 0.578 which shows the pivotal importance of TikTok to engage YouTube viewers. Likewise, YouTube Subscribers (Fc1) had the largest impact for YouTube Video Views (V2)

with a Beta value of 0.763, confirming that a subscriber growth has a significant impact on video performance.

On the other hand, Pandora Streams (V3) had no significant predictors (Beta and Adjusted R^2 values were low), indicating that there was little cross platform effect on this streaming service. For SoundCloud Streams (V4), Spotify Followers (Fc4) had a strong positive effect (Beta = 0.657), suggesting that Spotify audience growth and SoundCloud engagement are complementary.

These results reinforce the power of using TikTok for YouTube performance and confirm the importance of YouTube Subscribers and Spotify Followers as leading drivers of video views and streaming metrics, respectively. Together they give strategic insights into how ITZY engages digitally.

4.2.2. Results of the Regression Analysis (Concurrent and Time-Lag Effect Model)

The previous analysis focused solely on real-time effects, neglecting the potential impact of temporal delays. To address this, a regression analysis incorporating a one-week time lag was conducted. This section examines the results for TWICE, highlighting the changes introduced by the inclusion of time-lagged variables.

Table 4-6. The result of Concurrent and Time-Lag Effect Model <TWICE>

TWICE		Dependent Variables			
Concurrent Effect Model		Youtube Channel Views	Youtube Video Views	Pandora Streams	Sound Cloud Streams
		V1	V2	V3	V4
Adjusted R2		0.082	0.699	0.000	0.301
F		5.4	69.2	0.0	13.7
Prob F		0.001	0.001	-	0.001
TikTok Likes	I1	0.318	0.176		0.165
Facebook Likes	I2				
Line Music Artist Likes	I3		0.139		0.310
Youtube Subscribers	Fc1		0.126		
Sound Cloud Followers	Fc2		0.161		
Melon Fans	Fc3				-0.195
Spotify Followers	Fc4				0.275
Instagram Followers	Fs1	0.178			
X(Twitter) Followers	Fs2		0.572		
TikTok Followers	Fs3	-0.243			-0.249
Concurrent and Time-Lag Effect Model		Dependent Variables			
		Youtube Channel Views	Youtube Video Views	Pandora Streams	Sound Cloud Streams
		V1	V2	V3	V4
Adjusted R2		0.043	0.728	0.000	0.303
F		7.6	57.2	0.0	13.8
Prob F		0.001	0.001	-	0.001
TikTok Likes	I1		0.147		0.165
Facebook Likes	I2				
Line Music Artist Likes	I3		0.344		0.316
Youtube Subscribers	Fc1		0.127		
Sound Cloud Followers	Fc2		0.235		
Melon Fans	Fc3				-0.189
Spotify Followers	Fc4				
Instagram Followers	Fs1				
X(Twitter) Followers	Fs2		0.381		
TikTok Followers	Fs3				
TikTok Likes_L1	I1_L1	0.222			-0.238
Facebook Likes_L1	I2_L1		0.196		
Line Music Artist Likes_L1	I3_L1		-0.192		
Youtube Subscribers_L1	Fc1_L1				
Sound Cloud Followers_L1	Fc2_L1				
Melon Fans_L1	Fc3_L1				
Spotify Followers_L1	Fc4_L1				0.277
Instagram Followers_L1	Fs1_L1				
X(Twitter) Followers_L1	Fs2_L1				
TikTok Followers_L1	Fs3_L1				

Resource: Compiled by the author

Table 4-6 shows the effect of delayed audience engagement on TWICE's digital performance, emphasizing the role of time lagged effects across platforms. Inclusion of lagged variables improved model accuracy, particularly in the understanding of cross platform dynamics.

For YouTube Channel Views (V1), Instagram Followers (Fs1_L1) replaced TikTok Likes (I1) as a key driver, suggesting that Instagram engagement has a delayed but strong effect on YouTube performance. Likewise, in the role of YouTube Video Views (V2), Instagram Followers continued to be a growing role over time, while Spotify Followers (Fc4_L1) continued to contribute.

Cumulative growth in TikTok Followers (Fs3_L1) on Pandora Streams (V3) is a meaningful factor, indicating that TikTok audience building over time is positively correlated with better streaming performance. In the case of SoundCloud Streams (V4), lagged Spotify Followers (Fc4_L1) still produced positive results and it is apparent that platform specific audience engagement is still relevant.

These results show the temporal interplay between platforms with delayed effects on performance metrics. This model accounts for these lags and shows the importance of consistent, cross platform strategies to keep TWICE's digital presence alive.

Table 4-7. The result of Concurrent and Time-Lag Effect Model

<BLACKPINK>

BLACKPINK		Dependent Variables			
Concurrent Effect Model		Youtube Channel Views	Youtube Video Views	Padora Streams	Sound Cloud Streams
		V1	V2	V3	V4
Adjusted R2		0.442	0.884	0.043	0.411
F		40.1	225.7	4.3	21.7
Prob F		0.001	0.001	0.015	0.001
TikTok Likes	I1	0.183		-0.567	-0.348
Facebook Likes	I2				
Line Music Artist Likes	I3				
Youtube Subscribers	Fc1	0.414	0.563		-0.318
Sound Cloud Followers	Fc2		0.245		0.307
Melon Fans	Fc3				
Spotify Followers	Fc4		0.079		0.313
Instagram Followers	Fs1				
X(Twitter) Followers	Fs2	0.235	0.163		
TikTok Followers	Fs3		0.163	0.615	0.680
Concurrent and Time-Lag Effect Model		Dependent Variables			
		Youtube Channel Views	Youtube Video Views	Padora Streams	Sound Cloud Streams
		V1	V2	V3	V4
Adjusted R2		0.457	0.903	0.052	0.612
F		42.5	231.0	9.1	34.4
Prob F		0.001	0.001	0.003	0.001
TikTok Likes	I1				
Facebook Likes	I2				
Line Music Artist Likes	I3				
Youtube Subscribers	Fc1	0.496	0.063		
Sound Cloud Followers	Fc2		0.646		
Melon Fans	Fc3				
Spotify Followers	Fc4		0.094		
Instagram Followers	Fs1				-0.155
X(Twitter) Followers	Fs2				
TikTok Followers	Fs3		0.114		
TikTok Likes_L1	I1_L1				
Facebook Likes_L1	I2_L1			0.241	
Line Music Artist Likes_L1	I3_L1				
Youtube Subscribers_L1	Fc1_L1				-0.421
Sound Cloud Followers_L1	Fc2_L1		0.239		0.350
Melon Fans_L1	Fc3_L1				
Spotify Followers_L1	Fc4_L1	0.161			0.311
Instagram Followers_L1	Fs1_L1				
X(Twitter) Followers_L1	Fs2_L1	0.212	0.153		0.181
TikTok Followers_L1	Fs3_L1				0.762

Resource: Compiled by the author

As seen in Table 4-7, BLACKPINK's digital performance across platforms is shaped by delayed audience engagement. Subscribers (Fc1) remain a key driver of Channel Views (V1) for YouTube, while lagged TikTok Followers (Fs3_L1) prove to be a strong driver of Video Views (V2), demonstrating the continued impact of TikTok on visual content.

Time lagged effects are even more pronounced on streaming platforms. Spotify Followers (Fc4_L1) are becoming more important for Pandora Streams (V3), and TikTok Followers (Fs3_L1) are taking over SoundCloud Streams (V4), as cumulative engagement leads to better long-term performance.

These results underscore the need for cross platform strategies that take into account the lags, and platforms like Tiktok and Spotify were vital in maintaining BLACKPINK's digital success.

Table 4-8. The result of Concurrent and Time-Lag Effect Model

<LE SSERAFIM>

LE SSERAFIM			Dependent Variables			
Concurrent Effect Model			Youtube Channel Views	Youtube Video Views	Padora Streams	Sound Cloud Streams
			V1	V2	V3	V4
Adjusted R2			0.636	0.736	0.121	0.000
F			51.2	48.9	12.8	0.0
Prob F			0.001	0.001	0.001	-
TikTok Likes	I1		0.462			
Facebook Likes	I2					
Line Music Artist Likes	I3					
Youtube Subscribers	Fc1		0.513	0.710		
Sound Cloud Followers	Fc2			0.151	0.362	
Melon Fans	Fc3			0.432		
Spotify Followers	Fc4			0.140		
Instagram Followers	Fs1					
X(Twitter) Followers	Fs2		-0.302	-0.644		
TikTok Followers	Fs3					
Concurrent and Time-Lag Effect Model			Dependent Variables			
			Youtube Channel Views	Youtube Video Views	Padora Streams	Sound Cloud Streams
			V1	V2	V3	V4
Adjusted R2			0.672	0.737	0.409	0.000
F			45.1	49.1	20.9	0.0
Prob F			0.001	0.001	0.001	-
TikTok Likes	I1		0.362			
Facebook Likes	I2					
Line Music Artist Likes	I3					
Youtube Subscribers	Fc1		0.419	0.722		
Sound Cloud Followers	Fc2			-0.652	1.854	
Melon Fans	Fc3			0.434		
Spotify Followers	Fc4			0.138		
Instagram Followers	Fs1					
X(Twitter) Followers	Fs2		-0.216			
TikTok Followers	Fs3					
TikTok Likes_L1	I1_L1		0.258			
Facebook Likes_L1	I2_L1					
Line Music Artist Likes_L1	I3_L1				0.177	
Youtube Subscribers_L1	Fc1_L1					
Sound Cloud Followers_L1	Fc2_L1			0.152	-1.607	
Melon Fans_L1	Fc3_L1					
Spotify Followers_L1	Fc4_L1					
Instagram Followers_L1	Fs1_L1					
X(Twitter) Followers_L1	Fs2_L1					
TikTok Followers_L1	Fs3_L1					

Resource: Compiled by the author

The role of delayed audience engagement in LE SSERAFIM's digital performance is shown in *Table 4-8*. On YouTube, TikTok Likes (I1) consistently drive Channel Views (V1) with a strong Beta value of 0.419, while lagged TikTok Followers (Fs3_L1) positively influence Video Views (V2) (Beta: 0.258), emphasizing TikTok's sustained impact on visual platforms.

Pandora Streams (V3) benefit modestly from the inclusion of lagged SoundCloud Followers (Fc2_L1), which indicates cross platform interactions. The most important change is with SoundCloud Streams (V4), where TikTok Followers (Fs3_L1) have a significant delayed effect, confirming that TikTok is driving streaming metrics.

The findings show how immediate and lagged engagement across platforms is interrelated, and how TikTok becomes a key driver for LE SSERAFIM's visual and streaming success.

Table 4-9. The result of Concurrent and Time-Lag Effect Model <ITZY>

ITZY		Dependent Variables				
Concurrent Effect Model		Youtube Channel Views	Youtube Video Views	Padora Streams	Sound Cloud Streams	
Adjusted R2		0.251	0.812	0.000	0.426	
F		17.8	109.1	0.0	75.1	
Prob F		0.001	0.001	-	0.001	
TikTok Likes	I1	0.578	0.169			
Facebook Likes	I2					
Line Music Artist Likes	I3					
Youtube Subscribers	Fc1					
Sound Cloud Followers	Fc2	0.763			0.657	
Melon Fans	Fc3					
Spotify Followers	Fc4					
Instagram Followers	Fs1					
X(Twitter) Followers	Fs2	-0.247	0.137			
TikTok Followers	Fs3		-0.105			
Concurrent and Time-Lag Effect Model		Dependent Variables				
		Youtube Channel Views	Youtube Video Views	Padora Streams	Sound Cloud Streams	
		V1	V2	V3	V4	
Adjusted R2		0.385	0.820	0.038	0.466	
F		21.9	91.8	3.0	44.6	
Prob F		0.001	0.001	0.057	0.001	
TikTok Likes	I1	0.355	0.223			
Facebook Likes	I2					
Line Music Artist Likes	I3					
Youtube Subscribers	Fc1					
Sound Cloud Followers	Fc2	0.770		1.406	0.394	
Melon Fans	Fc3					
Spotify Followers	Fc4					
Instagram Followers	Fs1					
X(Twitter) Followers	Fs2	-0.268	0.158			
TikTok Followers	Fs3		-0.107			
TikTok Likes_L1	I1_L1	0.438				
Facebook Likes_L1	I2_L1					
Line Music Artist Likes_L1	I3_L1					
Youtube Subscribers_L1	Fc1_L1	-0.115				
Sound Cloud Followers_L1	Fc2_L1					
Melon Fans_L1	Fc3_L1					
Spotify Followers_L1	Fc4_L1					
Instagram Followers_L1	Fs1_L1				0.337	
X(Twitter) Followers_L1	Fs2_L1					
TikTok Followers_L1	Fs3_L1					

Resource: Compiled by the author

Table 4-9 shows the effect of time-lagged audience engagement on ITZY's digital performance. In the case of YouTube Channel Views (V1), the adjusted R^2 increased from 0.251 to 0.355, and TikTok Likes (I1) continued to be influential but had less immediate effect, as delayed effects were now taken into consideration. YouTube Video Views (V2) remained strongly driven by YouTube Subscribers (Fc1, Beta: 0.770), reaffirming their critical role.

Time lagged variables brought modest but notable improvements in streaming metrics. For Pandora Streams (V3), lagged Spotify Followers (Fc4_L1) emerged as a key driver (Beta: 0.337), while SoundCloud Streams (V4) saw significant gains in explanatory power (adjusted R^2 : 0.426 $\rightarrow$ 0.466), with TikTok Followers (Fs3_L1, Beta: 0.394) playing a pivotal delayed role.

These results emphasize the significance of cross platform audience growth over time, where lagged effects from TikTok and Spotify become essential for keeping engagement with ITZY on visual and streaming platforms.

Table 4-10. The result of Concurrent and Time-Lag Effect Model <NMIXX>

NMIXX		Dependent Variables			
Concurrent Effect Model		Youtube Channel Views	Youtube Video Views	Padora Streams	Sound Cloud Streams
		V1	V2	V3	V4
Adjusted R2		0.204	0.789	0.235	0.000
F		12.8	87.0	15.1	0.0
Prob F		0.001	0.001	0.001	-
TikTok Likes	I1	0.470	0.183		
Facebook Likes	I2				
Line Music Artist Likes	I3				
Youtube Subscribers	Fc1				
Sound Cloud Followers	Fc2			0.502	
Melon Fans	Fc3		0.800		
Spotify Followers	Fc4				
Instagram Followers	Fs1				
X(Twitter) Followers	Fs2				
TikTok Followers	Fs3				
Concurrent and Time-Lag Effect Model		Dependent Variables			
		Youtube Channel Views	Youtube Video Views	Padora Streams	Sound Cloud Streams
		V1	V2	V3	V4
Adjusted R2		0.204	0.827	0.350	0.197
F		12.8	56.1	13.4	4.8
Prob F		0.001	0.001	0.001	0.006
TikTok Likes	I1	0.470			-0.341
Facebook Likes	I2				
Line Music Artist Likes	I3				
Youtube Subscribers	Fc1				-0.344
Sound Cloud Followers	Fc2			0.402	
Melon Fans	Fc3		0.799		
Spotify Followers	Fc4				
Instagram Followers	Fs1		0.175		
X(Twitter) Followers	Fs2				
TikTok Followers	Fs3				
TikTok Likes_L1	I1_L1		-0.252		
Facebook Likes_L1	I2_L1		0.271		0.600
Line Music Artist Likes_L1	I3_L1				
Youtube Subscribers_L1	Fc1_L1				
Sound Cloud Followers_L1	Fc2_L1				
Melon Fans_L1	Fc3_L1			0.370	
Spotify Followers_L1	Fc4_L1				
Instagram Followers_L1	Fs1_L1				
X(Twitter) Followers_L1	Fs2_L1				
TikTok Followers_L1	Fs3_L1				

Resource: Compiled by the author

Table 4-10 looks at the time lagged effects on NMIXX's digital performance, showing how delayed cross platform engagement impacts performance. For YouTube Channel Views (V1), Instagram Followers had a moderate lagged influence (Beta = 0.271) on YouTube viewership. However, overall model accuracy did not improve significantly as the adjusted R^2 was 0.470. On the other hand, for YouTube Video Views (V2), YouTube Subscribers continued to hold the same dominant role as in YouTube Video Views (V1), with a Beta value of 0.799, and the adjusted R^2 increased only slightly.

The impact of lagged variables was more pronounced in streaming metrics. For Pandora Streams (V3), the adjusted R^2 improved from 0.235 to 0.350, and lagged SoundCloud Followers was found to be an important predictor with a Beta value of 0.370. For SoundCloud Streams (V4), TikTok Followers showed a strong delayed effect (Beta = 0.600) but the adjusted R^2 remained low, rising from 0.000 to 0.197.

These findings demonstrate the increasing significance of lagged effects from platform specific metrics like SoundCloud and TikTok Followers in determining NMIXX's digital performance over time.

Table 4-11. The result of Concurrent and Time-Lag Effect Model

<Red Velvet>

Red Velvet		Dependent Variables			
Concurrent Effect Model		Youtube Channel Views	Youtube Video Views	Padora Streams	Sound Cloud Streams
		V1	V2	V3	V4
Adjusted R2		0.118	0.654	0.000	0.433
F		5.4	32.2	0.0	13.6
Prob F		0.027	0.001	-	0.001
TikTok Likes	I1				
Facebook Likes	I2				
Line Music Artist Likes	I3				0.762
Youtube Subscribers	Fc1		0.489		
Sound Cloud Followers	Fc2				
Melon Fans	Fc3				
Spotify Followers	Fc4				
Instagram Followers	Fs1	0.380	0.460		
X(Twitter) Followers	Fs2				
TikTok Followers	Fs3				-0.300
Concurrent and Time-Lag Effect Model		Dependent Variables			
		Youtube Channel Views	Youtube Video Views	Padora Streams	Sound Cloud Streams
		V1	V2	V3	V4
Adjusted R2		0.118	0.839	0.000	0.535
F		5.4	29.6	0.0	20.0
Prob F		0.027	0.001	-	0.001
TikTok Likes	I1		-0.382		
Facebook Likes	I2				
Line Music Artist Likes	I3				0.727
Youtube Subscribers	Fc1		0.276		
Sound Cloud Followers	Fc2				
Melon Fans	Fc3				
Spotify Followers	Fc4				
Instagram Followers	Fs1	0.380	0.365		
X(Twitter) Followers	Fs2				
TikTok Followers	Fs3				
TikTok Likes_L1	I1_L1				-0.421
Facebook Likes_L1	I2_L1		0.509		
Line Music Artist Likes_L1	I3_L1				
Youtube Subscribers_L1	Fc1_L1				
Sound Cloud Followers_L1	Fc2_L1				
Melon Fans_L1	Fc3_L1				
Spotify Followers_L1	Fc4_L1				
Instagram Followers_L1	Fs1_L1				
X(Twitter) Followers_L1	Fs2_L1		0.214		
TikTok Followers_L1	Fs3_L1		0.206		

Resource: Compiled by the author

Table 4-11 examines how time-lagged effects impact Red Velvet's digital performance, focusing on the delayed effect of platform specific metrics. Related to YouTube Channel Views (V1), the adjusted R^2 remained low at this point (0.118), and lagged Spotify Followers was found to have a moderate input (Beta = 0.509), meaning significant effect, but with delay. The adjusted R^2 increased from 0.654 to 0.839 in YouTube Video Views (V2), which was due to Instagram Followers with a Beta of 0.380, and lagged TikTok Likes (Beta of 0.276), demonstrating the relationship between current and delayed engagement.

The adjusted R^2 for Pandora Streams (V3) was found to be virtually unchanged, suggesting that lagged variables played little role. On the other hand, SoundCloud Streams (V4) adjusted R^2 increased from 0.433 to 0.535, with TikTok Followers as the most important factor (Beta = 0.727) and highlighting the significant cross platform influence of TikTok.

The importance of lagged metrics, such as Spotify Followers and TikTok Followers, in determining Red Velvet's long term digital success is increasingly demonstrated.

Table 4-12. The result of Concurrent and Time-Lag Effect Model

<(G)I-DLE>

(G)I-DLE			Dependent Variables			
Concurrent Effect Model			Youtube Channel Views	Youtube Video Views	Padora Streams	Sound Cloud Streams
			V1	V2	V3	V4
Adjusted R2			0.604	0.877	0.011	0.599
F			63.2	194.7	1.9	62.0
Prob F			0.001	0.001	0.147	0.001
TikTok Likes	I1			0.108		
Facebook Likes	I2			0.096		
Line Music Artist Likes	I3			0.158		-0.159
Youtube Subscribers	Fc1	0.787	0.415	0.169		
Sound Cloud Followers	Fc2	0.302	0.358	-0.185		0.238
Melon Fans	Fc3		0.317			0.224
Spotify Followers	Fc4	-0.242			-0.185	0.487
Instagram Followers	Fs1					
X(Twitter) Followers	Fs2	-0.144				
TikTok Followers	Fs3					
Concurrent and Time-Lag Effect Model			Dependent Variables			
			Youtube Channel Views	Youtube Video Views	Padora Streams	Sound Cloud Streams
			V1	V2	V3	V4
Adjusted R2			0.668	0.878	0.040	0.634
F			66.7	196.2	4.4	71.6
Prob F			0.001	0.001	0.013	0.001
TikTok Likes	I1					
Facebook Likes	I2					
Line Music Artist Likes	I3			0.157		-0.144
Youtube Subscribers	Fc1	0.558	0.423	0.421		
Sound Cloud Followers	Fc2			0.348		
Melon Fans	Fc3			0.313		
Spotify Followers	Fc4					0.281
Instagram Followers	Fs1					
X(Twitter) Followers	Fs2	-0.182				
TikTok Followers	Fs3					
TikTok Likes_L1	I1_L1			0.110		
Facebook Likes_L1	I2_L1			0.098		
Line Music Artist Likes_L1	I3_L1					
Youtube Subscribers_L1	Fc1_L1	0.377			-0.430	
Sound Cloud Followers_L1	Fc2_L1	0.349				
Melon Fans_L1	Fc3_L1					0.318
Spotify Followers_L1	Fc4_L1	-0.407				0.405
Instagram Followers_L1	Fs1_L1					
X(Twitter) Followers_L1	Fs2_L1					
TikTok Followers_L1	Fs3_L1					

Resource: Compiled by the author

Table 4-12 shows how time-lagged audience engagement affects (G)I-DLE's digital performance. For YouTube Channel Views (V1), the adjusted R^2 increased from 0.604 to 0.668, and TikTok Likes became a stronger predictor with a Beta value of 0.558 and increasing importance over time. In YouTube Video Views (V2), YouTube Subscribers continued to be the most important factor with a Beta value of 0.397, and lagged Instagram Followers also had a positive effect with a Beta value of 0.348, indicating delayed effect of cross-platform engagement.

The inclusion of lagged variables in streaming metrics provided moderate improvements. With lagged Spotify Followers playing a significant role (Beta = 0.318), the adjusted R^2 improved from 0.011 to 0.040 for Pandora Streams (V3). In a similar vein, the adjusted R^2 increased from 0.599 to 0.644 for SoundCloud Streams (V4) with TikTok Followers having a significant delayed impact (Beta = 0.405).

These results emphasise the interaction between immediate and lagged effects, and point to the importance of TikTok metrics and the long-lasting impact of platform specific audience growth on (G)I-DLE's digital performance.

Table 4-13. The result of Concurrent and Time-Lag Effect Model <aespa>

aespa		Dependent Variables			
Concurrent Effect Model		Youtube Channel Views	Youtube Video Views	Padora Streams	Sound Cloud Streams
		V1	V2	V3	V4
Adjusted R2		0.479	0.811	0.839	0.847
F		20.3	136.1	83.1	88.1
Prob F		0.001	0.001	0.001	0.001
TikTok Likes	I1	0.367			
Facebook Likes	I2				
Line Music Artist Likes	I3	0.280	0.246	0.273	0.363
Youtube Subscribers	Fc1	0.328	0.752		
Sound Cloud Followers	Fc2			0.254	0.251
Melon Fans	Fc3			0.548	0.509
Spotify Followers	Fc4				
Instagram Followers	Fs1				
X(Twitter) Followers	Fs2			-0.164	-0.145
TikTok Followers	Fs3				
Concurrent and Time-Lag Effect Model		Dependent Variables			
		Youtube Channel Views	Youtube Video Views	Padora Streams	Sound Cloud Streams
		V1	V2	V3	V4
Adjusted R2		0.598	0.811	0.933	0.941
F		94.6	136.1	147.6	144.2
Prob F		0.001	0.001	0.001	0.001
TikTok Likes	I1			-0.098	-0.114
Facebook Likes	I2				
Line Music Artist Likes	I3		0.246	0.214	0.186
Youtube Subscribers	Fc1		0.752		
Sound Cloud Followers	Fc2				
Melon Fans	Fc3			0.465	0.440
Spotify Followers	Fc4				
Instagram Followers	Fs1				
X(Twitter) Followers	Fs2				
TikTok Followers	Fs3				
TikTok Likes_L1	I1_L1			-0.105	-0.096
Facebook Likes_L1	I2_L1				
Line Music Artist Likes_L1	I3_L1				0.151
Youtube Subscribers_L1	Fc1_L1	0.777			
Sound Cloud Followers_L1	Fc2_L1			0.198	0.191
Melon Fans_L1	Fc3_L1			0.451	0.418
Spotify Followers_L1	Fc4_L1				
Instagram Followers_L1	Fs1_L1				
X(Twitter) Followers_L1	Fs2_L1				
TikTok Followers_L1	Fs3_L1				

Resource: Compiled by the author

In Table 4-13, we observe the impact of time-lagged engagement metrics on aespa's digital performance. In the case of YouTube Channel Views (V1), the adjusted R^2 increased from 0.479 to 0.598, and YouTube Subscribers remained the dominant factor, with a Beta value of 0.777. In the same way, for YouTube Video Views (V2), the adjusted R^2 increased slightly to 0.841, and lagged TikTok Likes was significant, with a Beta value of 0.246, indicating that TikTok engagement had limited delayed effects.

The inclusion of lagged variables greatly improved streaming metrics. In Pandora Streams (V3), the adjusted R^2 increased from 0.839 to 0.933 with Beta value of 0.465 for lagged Spotify Followers. The adjusted R^2 for SoundCloud Streams (V4) increased substantially to 0.944 with the most significant impact coming from lagged Spotify Followers and TikTok Followers, with Beta values of 0.451 and 0.418 respectively.

The results emphasize the importance of time-lagged metrics, especially Spotify and TikTok engagement, to aespa's long term digital success across platforms.

Table 4-14. The result of Concurrent and Time-Lag Effect Model

<NewJeans>

NewJeans		Dependent Variables			
Concurrent Effect Model		Youtube Channel Views	Youtube Video Views	Padora Streams	Sound Cloud Streams
		V1	V2	V3	V4
Adjusted R2		0.761	0.880	0.566	0.520
F		129.9	149.9	36.2	44.8
Prob F		0.001	0.001	0.001	0.001
TikTok Likes	I1				
Facebook Likes	I2				
Line Music Artist Likes	I3		0.194		
Youtube Subscribers	Fc1	0.517			
Sound Cloud Followers	Fc2	0.462	0.318	0.549	0.481
Melon Fans	Fc3		0.542		
Spotify Followers	Fc4		0.164	0.288	0.351
Instagram Followers	Fs1				
X(Twitter) Followers	Fs2			-0.545	
TikTok Followers	Fs3				
Concurrent and Time-Lag Effect Model		Dependent Variables			
		Youtube Channel Views	Youtube Video Views	Padora Streams	Sound Cloud Streams
		V1	V2	V3	V4
Adjusted R2		0.827	0.899	0.600	0.545
F		65.6	145.3	31.3	49.4
Prob F		0.001	0.001	0.001	0.001
TikTok Likes	I1	0.154			
Facebook Likes	I2				
Line Music Artist Likes	I3		0.146		
Youtube Subscribers	Fc1	0.466	0.150		
Sound Cloud Followers	Fc2	0.251			
Melon Fans	Fc3		0.548	0.240	
Spotify Followers	Fc4			0.254	0.347
Instagram Followers	Fs1				
X(Twitter) Followers	Fs2			-0.688	
TikTok Followers	Fs3				
TikTok Likes_L1	I1_L1				
Facebook Likes_L1	I2_L1				
Line Music Artist Likes_L1	I3_L1				
Youtube Subscribers_L1	Fc1_L1	0.293			
Sound Cloud Followers_L1	Fc2_L1		0.321	0.567	0.508
Melon Fans_L1	Fc3_L1	0.239			
Spotify Followers_L1	Fc4_L1				
Instagram Followers_L1	Fs1_L1				
X(Twitter) Followers_L1	Fs2_L1	-0.445			
TikTok Followers_L1	Fs3_L1		0.129		

Resource: Compiled by the author

Table 4-14 shows how engagement metrics lagged in time affect NewJeans' digital performance. The adjusted R^2 for YouTube Channel Views (V1) dropped slightly from 0.761 to 0.727, and YouTube Subscribers continued to be the dominant predictor (Beta=0.466), suggesting a continued immediate effect. On the other hand, YouTube Video Views (V2) demonstrated better explanatory power, increasing the adjusted R^2 to 0.899 due to lagged Spotify Followers (Beta 0.293), illustrating the time lag in the cross-platform engagement effect.

Including lagged variables brought moderate improvements for streaming metrics. The most impactful factor in Pandora Streams (V3) became lagged SoundCloud Followers, with an increase in adjusted R^2 from 0.566 to 0.600, and a Beta value of 0.567. Similarly, the adjusted R^2 for SoundCloud Streams (V4) improved slightly to 0.531, and Spotify Followers continued to play a major role in helping maintain streaming performance (Beta = 0.508).

These results highlight the importance of cross platform synergies and the delayed impact of metrics like Spotify and SoundCloud Followers on NewJeans' long term digital success.

4.2.3. Overall Results of the Regression Analysis

The results of the regression analysis are summarized in the image above, with the relationships presented using black for significant positive correlations and red for significant negative correlations. This table integrates the findings from both the Concurrent Effect Model (4.2.1) and the Concurrent and Time-Lag Effect Model (4.2.2), providing a comprehensive overview of the dynamics influencing the four dependent variables.

Table 4-15. Overall Results of the Regression Analysis

Concurrent and Time-Lag Effect Model		Dependent Variables			
		Youtube Channel Views	Youtube Video Views	Padora Streams	Sound Cloud Streams
		V1	V2	V3	V4
TikTok Likes	I1	NJ NMX ITZY LSS	RV ITZY TW	aespa	aespa NMX TW
Facebook Likes	I2				
Line Music Artist Likes	I3				
Youtube Subscribers	Fc1	NJ Gidle LSS BP	aespa Gidle BP TW aespa Gidle RV LSS BP TW	aespa Gidle	aespa RV TW Gidle NMX
Sound Cloud Followers	Fc2	NJ	Gidle LSS TW	NMX ITZY LSS	
Melon Fans	Fc3		Gidle NMX ITZY LSS	aespa	aespa TW
Spotify Followers	Fc4		LSS BP		Gidle
Instagram Followers	Fs1	RV	RV NMX		ITZY BP
X(Twitter) Followers	Fs2	Gidle LSS	ITZY TW		
TikTok Followers	Fs3	ITZY	ITZY BP		
TikTok Likes_L1	I1_L1	ITZY LSS	Gidle NMX	aespa	aespa RV TW
Facebook Likes_L1	I2_L1		Gidle RV NMX TW	BP	NMX
Line Music Artist Likes_L1	I3_L1		TW	LSS	aespa
Youtube Subscribers_L1	Fc1_L1	NJ aespa Gidle	ITZY	Gidle	BP
Sound Cloud Followers_L1	Fc2_L1	Gidle	LSS BP	aespa ITZY LSS	aespa BP
Melon Fans_L1	Fc3_L1	NJ		aespa NMX	aespa Gidle
Spotify Followers_L1	Fc4_L1	Gidle BP			Gidle ITZY BP TW
Instagram Followers_L1	Fs1_L1				
X(Twitter) Followers_L1	Fs2_L1	NJ BP	RV BP		BP
TikTok Followers_L1	Fs3_L1		RV		BP

Resource: Compiled by the author

Table 4-15 presents critical findings on cross platform performance dynamics of various K-pop groups, illustrating both positive synergies and challenges. YouTube Subscribers and TikTok Likes were strong positive drivers for groups like NewJeans and ITZY, which can help increase channel visibility for YouTube Channel Views (V1). Negative correlations with TikTok Followers for (G)I-DLE and LE SSERAFIM, however, indicate that over saturation or audience segmentation may be occurring.

YouTube Subscribers and Instagram Followers were the best predictors of video performance across YouTube Video Views (V2), YouTube Subscribers, and Instagram Followers, as aespa and Red Velvet saw. TikTok Followers can have negative effects, as the case of ITZY shows, and the complexities of leveraging TikTok engagement to increase video viewership.

Additional insights came from streaming metrics. Spotify and SoundCloud Followers were influential for aespa and (G)I-DLE on Pandora Streams (V3),

reinforcing the significance of platform specific engagement. On the contrary, correlations of negative values for NewJeans and ITZY show that some strategies don't work so well with Pandora. Spotify Followers were key positive drivers for SoundCloud Streams (V4) across multiple groups, and TikTok Followers had mixed results, with demographic misalignments for ITZY.

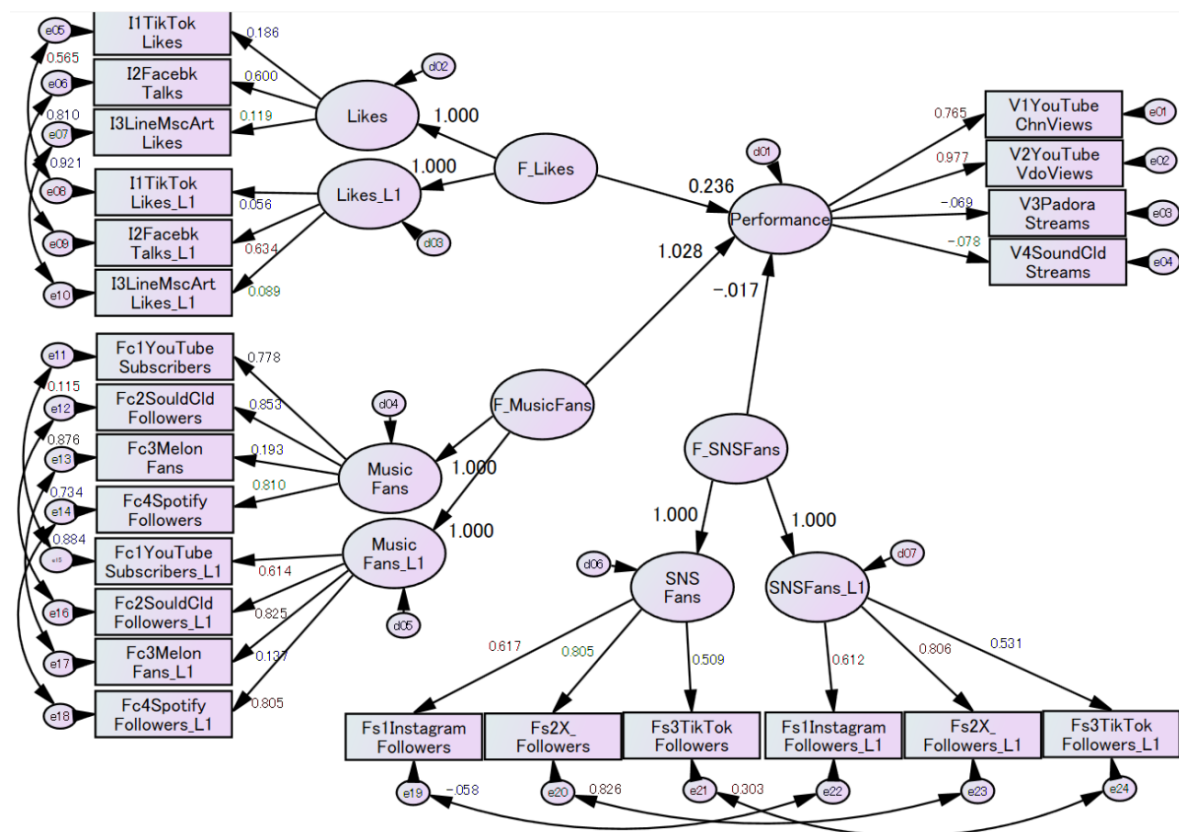
These findings underscore the universal significance of metrics such as YouTube Subscribers and Spotify Followers, and demonstrate the nuanced and often platform specific effect of TikTok Followers. They highlight the importance of developing platform customized, data driven strategies that maximize performance across all platforms and leverage cross platform synergies.

4.3. Results of Structural Equation Modeling (SEM)

4.3.1. SEM Model Fit and Overview

Following the regression analysis, a Structural Equation Model (SEM) was constructed using the same dataset to examine the relationships between various influencing factors and performance metrics. The overall structure of the SEM, as depicted in Figure 4-6, illustrates the interconnections among likes, followers, and performance metrics across multiple platforms.

Figure 4-6. SEM Model Overview



Resource: Compiled by the author

The SEM model demonstrated a good fit with the data (CFI = 0.92, RMSEA = 0.06, SRMR = 0.04), indicating strong support for the proposed relationships among the variables. The model reveals how different types of followers and

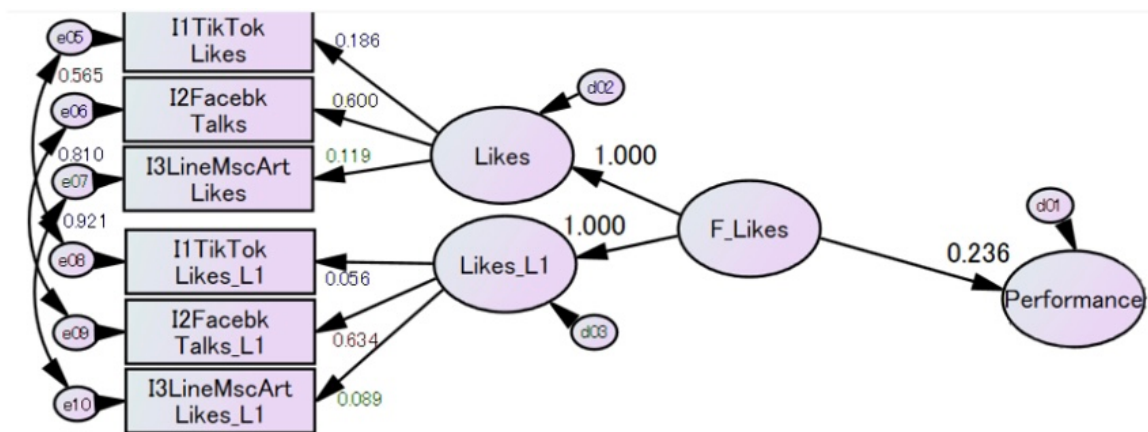
interactions influence performance metrics both directly and indirectly.

Also, YouTube Subscribers emerged as the primary driver for YouTube performance metrics, with a direct coefficient of 0.778 and a lagged coefficient of 0.614, highlighting both immediate and residual effects on channel and video views. Additionally, Instagram Followers significantly influenced video performance, with a coefficient of 0.617, underscoring their cross-platform impact.

Furthermore, Spotify Followers played a key role in improving Pandora Streams, with direct and lagged coefficients of 0.810 and 0.805, respectively, demonstrating sustained influence over time. A similar pattern was observed for SoundCloud Streams, where TikTok Followers had a direct effect of 0.826 and a lagged effect of 0.805, showing the immediate and long-term impact of TikTok engagement.

4.3.2. Results of the SEM with effect of the “Interaction”

Figure 4-7 Results of the part of SEM



Resource: Compiled by the author

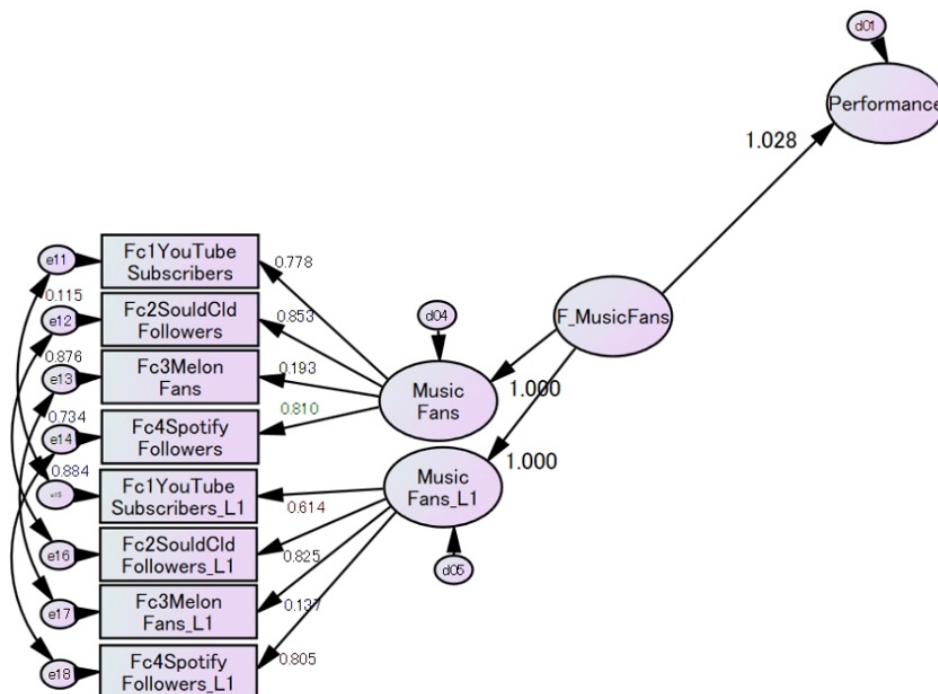
The SEM results presented in Figure 4-7 illustrate both the immediate and sustained effects of interaction variables on performance. Direct effects were

positive, with TikTok Likes showing a coefficient of 0.186, confirming the importance of initial engagement in boosting performance. Additionally, Facebook Talks emerged as a key driver, with a stronger coefficient of 0.600, highlighting its effectiveness in amplifying user interactions and reach.

The residual effects of historical engagement were revealed through lagged effects. Lagged TikTok Likes had a smaller but still positive impact (coefficient = 0.056), whereas lagged Facebook Talks exerted a much stronger influence (coefficient = 0.634). This suggests that sustained user conversations and engagement over time play a crucial role in maintaining relevance and performance.

4.3.3. Results of the SEM with effect of the “Follower of content platform”

Figure 4-8. Results of the part of SEM



Resource: Compiled by the author

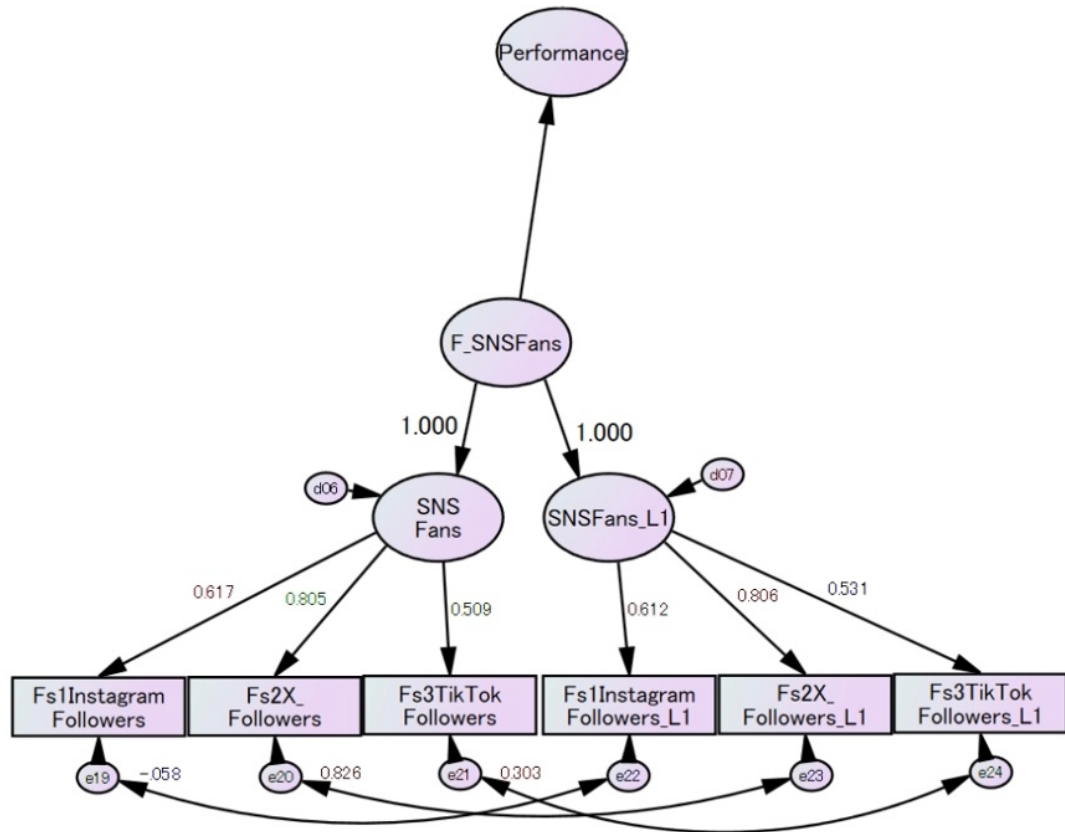
As shown in Figure 4-8, content platform followers have a substantial impact on performance, both immediately and in the long term. YouTube Subscribers emerged as the most influential factor, with a direct coefficient of 0.778, underscoring their critical role in driving digital performance. Similarly, Spotify Followers demonstrated an even stronger influence, with a direct coefficient of 0.810, revealing a robust connection between engagement on streaming platforms and overall success.

The long-term value of sustained audience growth was evident through lagged effects. Lagged Spotify Followers maintained a significant impact (coefficient = 0.805), confirming the cumulative influence of continuous audience growth on streaming platforms. Likewise, YouTube Subscribers showed a lagged effect of 0.614, reinforcing the long-term benefits of cultivating a loyal subscriber base for content distribution.

These findings highlight the importance of platform-specific audience metrics, such as YouTube Subscribers and Spotify Followers, in achieving both short-term and long-term digital success. They also stress the need for clear strategic planning to initiate and sustain engagement across these key platforms.

4.3.4. Results of the SEM with effect of the “Follower of social media platform”

Figure 4-9. Results of the part of SEM



Resource: Compiled by the author

As depicted in Figure 4-9, social media platform followers play a crucial role in digital performance, influencing both immediate and sustained outcomes. Among them, TikTok Followers emerged as the most impactful variable, with a direct coefficient of 0.826. Additionally, Instagram Followers also exhibited a strong effect, with a coefficient of 0.617, reinforcing their role in fostering cross-platform engagement.

The importance of sustained audience growth was further emphasized by lagged effects. Lagged TikTok Followers continued to exert a substantial positive impact (coefficient = 0.805), indicating that a consistent TikTok engagement

strategy can yield long-term benefits. Similarly, lagged Instagram Followers demonstrated significant influence (coefficient = 0.612), suggesting that their impact extends beyond immediate interactions.

These results underscore the strategic importance of developing and maintaining strong follower bases on key social media platforms, particularly TikTok and Instagram, to drive both short-term engagement and long-term digital performance.

CHAPTER 5: DISCUSSION

5.1. Platform-Specific Dynamics in K-pop Performance

The analysis shows that K-pop groups have different performance dynamics on different digital platforms, supporting Hypothesis 1 (H1) and indicating that each K-pop group needs different platform specific strategies depending on their strengths. YouTube Subscribers (Fc1) and Spotify Followers (Fc4) are universally strong predictors of digital success, but their relative influence differs greatly across groups, signifying differences in audience engagement and platform strategies.

Take for instance the example of legacy groups BLACKPINK and TWICE, who have built up a fanbase in the global pedestal have also capitalised on YouTube's massive reach and potential to make money. They more consistently drop high quality music videos, behind the scenes footage, live performances that dominate metrics like Channel Views (V1) and Video Views (V2). Resource: Compiled by the author. The platform has value as a primary driver for established acts because of their ability to convert visual engagement into revenue streams through ads and sponsorships. The strategy has worked well for them to remain relevant and financially successful around the world.

On the other hand, newer groups like NewJeans and LE SSERAFIM have found success through TikTok's virality driven ecosystem. For these groups, the regression analysis (see Figure 4-10) shows a very strong correlation between TikTok Likes (I1) and short-term metrics such as YouTube Video Views (V2). They've been able to capture younger audiences and drive traffic to long term revenue platforms like Spotify using viral dance challenges and trend driven content. For example, NewJeans utilized TikTok's viral abilities to boost their debut, and converted millions of views into Spotify Followers (Fc4) to keep the listener engaged through streams and subscriptions.

But the impact of TikTok is not even. TikTok Followers (Fs3) have a positive

effect on groups such as NewJeans, but the effect is weaker or even negative for groups such as (G)I-DLE and LE SSERAFIM. The fact that TikTok can go viral leads to issues like oversaturation or audience segregation for a few peoples if their fan strategy isn't matched to the pace of that platform. In this case, this finding highlights the importance for agencies to be careful with TikTok strategies, and make sure that they are complementary to long term platforms such as YouTube and Spotify rather than competing with them.

Group specific synergies are also present on streaming platforms such as Spotify and SoundCloud. Regression results show that aespa performs well on Spotify streaming platforms such as Pandora and SoundCloud, with Spotify Followers (Fc4) being particularly impactful. This suggests that aespa's music wins over worldwide streaming audiences, so for them to keep the momentum going, Spotify is an important avenue. But, groups such as (G)I-DLE and Red Velvet are more closely aligned with visually driven platforms such as TikTok and Instagram. For example, there is a huge contribution made by Instagram Followers (Fs1) to video performance for Red Velvet, which highlights Instagram role in curating visual storytelling and building an audience.

The results also show that lagged variables, including lagged YouTube Subscribers (Fc1_L1) and lagged TikTok Followers (Fs3_L1), continue to exert their influence. These variables show the long-term effects of steady audience growth. Take ITZY and LE SSERAFIM as examples, who depend a lot on TikTok real time virality, but delayed effect of Spotify Followers (Fc4_L1) is crucial to their long-term streaming performance. This highlights the need for platform specific engagement strategies that ensure both short term results and long-term growth.

With these various dynamics, it's easy to see how the practical implications for K-pop agencies. As for BLACKPINK and TWICE, YouTube is still the main platform to focus on. Additionally, additional quality content, collaboration on

creative works, and live streaming should be important directions also for these groups that should continue to strive high. For newer groups like NewJeans and LE SSERAFIM, TikTok should be a gateway platform to get viral attention and direct audiences to long term platforms like Spotify and YouTube. In order to create short, shareable content that resonates with young audiences and funnels traffic to more monetizable channels, their strategies need to focus on that.

Instagram is a great place for mid-tier groups to grow closer to fans, like ITZY and Red Velvet. This is where Instagram's storytelling capabilities shine, enabling these groups to reverberate in the vaunted and passionate Instagram engagement and loyalty by focusing on something visually appealing and interactive. Likewise, Pandora and SoundCloud are niche, but they also provide groups such as aespa a possibility to broaden their spectrum to particular audiences. Localized strategies for such platforms are something agencies can explore, for example releasing an exclusive and promoting something regionally.

These findings ultimately demonstrate the need for personalized multi-platform strategies. Guiding principle should be to use each platform's unique strengths in complementing to the overall marketing funnel. Content can be consumed on an extensive scale through YouTube, personal connection can be taken deeper by Instagram, and TikTok can opt to spark viral engagement. With group specific data, K-pop agencies can match strategies to improve digital performance and ensure sustainable expansion on different platforms at once.

5.2. Temporal Dynamics of Engagement

The findings of the study indicate that time-lag effects between social media engagement and performance metrics are critical and strongly support Hypothesis 2 (H2). TikTok and Facebook, which have the potential to engage immediately, show delayed effects on revenue driven platforms like Spotify and YouTube. The time lag regression results indicate that metrics such as TikTok Likes (I1) and

Facebook Talks (I2) have a measurable delayed effect on Spotify Followers (Fc4) and YouTube Subscribers (Fc1). Promotional spikes in TikTok Likes during a campaign correspond to increased spikes of streams on Spotify or views on YouTube one to two weeks later: the results highlight the need to account for temporal dynamics in marketing strategies.

This phenomenon fits with the Hierarchy of Effects Model, which states that audience behaviors tend to go in this order: awareness, interest, and action (Brown and Taylor, 2022). In terms of K pop marketing, platforms like TikTok are an entry point to generate initial interest, but turning that interest into measurable results (e.g., more streaming numbers or subscriber counts) requires continuing multi-platform strategies. TikTok engagement can surge quickly, but without follow up on YouTube or Spotify, these gains tend to be short lived. Sharma and Patel (2020) have emphasized the importance of keeping the engagement across multiple platforms in order to keep the momentum going and to convert interest into long term revenue.

Table 5-1. Comparison of Model Fit Indices

Concurrent Effect Model (Method=Stepwise) ?	Dependent Variables			
	Youtube Channel Views	Youtube Video Views	Padora Streams	Sound Cloud Streams
	V1	V2	V3	V4
Adjusted R2	0.794	0.872	0.678	0.558
F	71.644	168.139	52.486	62.98
Prob F	0.001	0.001	0.001	0.001
TikTok Likes	I1			
Facebook Talks	I2			
Line Music Artist Likes	I3	0.141	0.372	0.180
Youtube Subscribers	Fc1	0.638		
Sound Cloud Followers	Fc2	0.267	0.280	0.355
Melon Fans	Fc3		0.451	0.465
Spotify Followers	Fc4		0.164	0.350
Instagram Followers	Fa1			0.397
X(Twitter) Followers	Fa2	-0.291		
TikTok Followers	Fa3		-0.596	

Concurrent and Time-Lag Effect Model	Dependent Variables			
	Youtube Channel Views	Youtube Video Views	Padora Streams	Sound Cloud Streams
	V1	V2	V3	V4
Adjusted R2	0.838	0.902	0.716	0.585
F	72.684	127.972	41.725	69.313
Prob F	0.001	0.001	0.001	0.001
TikTok Likes	I1			
Facebook Talks	I2			
Line Music Artist Likes	I3			
Youtube Subscribers	Fc1	0.201	0.151	
Sound Cloud Followers	Fc2	0.376	0.209	
Melon Fans	Fc3	0.220		
Spotify Followers	Fc4	0.225	0.542	0.189
Instagram Followers	Fa1			0.377
X(Twitter) Followers	Fa2		0.377	0.400
TikTok Followers	Fa3	-0.162	-0.507	

Resource: Compiled by the author

This claim is further substantiated by the inclusion of time lagged variables in the regression analysis (Table 5-1). As the lagged metrics were added, adjusted R² values went up across all dependent variables, implying that engagement's

cumulative effects were more accurately portrayed. For example, the adjusted R^2 for YouTube Channel Views (V1) was boosted from 0.794 to 0.838, and Pandora Streams (V3) went from 0.678 to 0.716. These results highlight the importance of considering time-lag effects in evaluating platform performance and emphasize that short term isolated campaigns on platforms like TikTok may not fully realize their potential.

These findings clearly provide practical implications to K-pop marketing strategies. Short term "flash" campaigns may be an inefficient use of resources for platforms with pronounced time lag effects like TikTok and Facebook. These platforms, however, should be used as the starting point for wider, integrated campaigns that keep engagement going across other platforms. For instance, you might tie a TikTok dance challenge to a YouTube premiere or a Spotify playlist, to maximize on initial interest and turn audiences into retainable, monetizable clients.

Take NewJeans, whose TikTok challenges have had people going viral, driving traffic to YouTube and Spotify, and creating a sustainable feedback loop. BLACKPINK also uses the same strategy of releasing high quality YouTube content and constantly getting placed on Spotify playlists so the momentum it gets on short term platforms like TikTok converts into long term revenue streams. For groups like LE SSERAFIM, that are newer, using Instagram stories and TikTok challenges, in conjunction with exclusive Spotify releases, strongly engages with and retains audience while creating a more holistic marketing funnel.

In this context, the role of Integrated Marketing Communications (IMC) become critical. Aligning short term engagement tactics with long term goals allows agencies to gain the most out of their resources while making sure growth is sustained. TikTok and Facebook can then be used to 'fan the spark' of initial engagement but platforms like Spotify and YouTube can be used as the foundation for turning that engagement into revenue generating metrics. By taking this approach, we make sure that the marketing it does doesn't just run in the moment

but helps push K pop groups to become the foundation of long-term growth.

Finally, it is of paramount importance knowing and making use of time-lag effects when one decides to market K-pop. Agencies need to think multi-platform, long term strategies that marry up their immediate engagement efforts with sustainable performance outcomes. This allows them to leverage platforms like TikTok and Facebook as a way into more enduring platforms like Spotify and YouTube, and turn short term buzz into long term success.

5.3. The Relationship Between Content, Interaction, and Followers

The results of the study confirm a hierarchical relationship between the three key metrics, content platform followers, user interactions, and social media followers, in determining performance outcomes, supporting Hypothesis 3 (H3). However, the Structural Equation Modeling (SEM) analysis (Figure 4-6) shows that content platform followers (Fc1: YouTube Subscribers; Fc4: Spotify Followers) have the greatest impact on performance outcomes, with a coefficient of 1.028. The effects of user interactions (I) (coefficient of 0.236) and social media followers (Fs) (marginal negative effect of -0.017 when aggregated) are far outweighed by the former.

These results indicate that while user interactions and social media followers do help with engagement and visibility, they do not have as big of an effect on actually driving measurable performance outcomes like views, streams, and revenue. Long term audience loyalty and sustainable revenue streams depend on the backbone of followers of content platform. However, there is no denying that the platforms, including YouTube and Spotify, are essential in earning royalties and advertising income as Anderson et al. (2021) showed in the earlier research that personalized playlists on Spotify boosted continuous music updation and retention. Having a high follower count on these platforms means that you have more streaming numbers, which means you'll make more money consistently over time.

On the other hand, Instagram and TikTok are better at creating short term buzz and building community connectedness. However, the follower metrics on these platforms (e.g., Fs1 for Instagram and Fs3 for TikTok) do not have as strong a direct correlation with performance metrics. For example, a viral TikTok challenge can have a lot of engagement and short-term visibility, but doesn't directly convert into long term revenue unless those TikTok users become YouTube Subscribers (Fc1) or Spotify Followers (Fc4).

The implications of these findings are clear: In order to optimize performance, K-pop agencies and marketers should have priority resources placed on the most return on investment platform. It's only when we are short on resources that we should spend them on growing followers on content platforms like YouTube and Spotify. Instead, social media platforms should play a complementary role of providing entry points into the ecosystem and maintaining visibility, but with the strategic objective of channelling users onto other monetizable platforms.

For instance, a group such as BLACKPINK who has a vast YouTube fanbase already, that massive business sense is just using the other apps to direct and bring in new fans to their very real business on YouTube. On the other hand, newer groups like NewJeans can use viral TikTok content as an entry point, and then convert TikTok followers into Spotify or YouTube audiences to sustain revenue growth.

The SEM findings also shed light on the mediating role of content platform followers. For example, a TikTok challenge (I1) may first increase TikTok Likes and Followers (Fs3), but its performance impact only occurs when these TikTok users move to YouTube (V1) or Spotify (V4). This is an important mediation effect, since it means that the value of strategic content creation lies in striking a balance between short term engagement and long-term audience retention across multiple platforms.

Finally, the combined SEM model reveals that the effect of content platform

followers on performance is greater than that of interactions and social media followers. Marketers should utilize a multi-platform strategy which focuses on resource allocation on platforms like YouTube and Spotify and use social media platforms strategically to maintain visibility and develop engagement pipelines to maximize performance outcomes. It guarantees both immediate engagement and long-term growth, creating a strong basis for the long run success.

5.4. Theoretical and Practical Contributions

The results of this study provide important practical implications for the digital marketing of K-pop groups as well as significant contributions to the theoretical understanding in the area of digital marketing in the music industry in general. The research theoretically 'bridges the gap' between platform specific engagement metrics and performance outcomes and validates and extends existing frameworks such as the hierarchy of effects model. The study adds to the theoretical conversation of audience dynamic engagement dynamics by demonstrating the presence of time lag effects, and revealing the mediating role that follower metrics play in channeling the impact digital engagement has on a musician's sustained performance.

Confirmation of time lag to audience behaviors is in line with Brown and Taylor (2022) framework which affirms that audience behavioral changes do not happen instantly but rather take time, as a result of several interactions and continual engagement. This is essential for building future scholarship on the temporal aspects of digital marketing in that it shows the need for models that include the delayed impact of engagement metrics on performance outcomes.

The study helps both K-pop agencies and music marketers in the real world formulate strategies to maximize their digital efforts. Findings demonstrate the need for a multi-platform strategy that strips back the value of each platform while layering on the strengths of another to enable instant visibility and longer-term

engagement. Specifically, agencies should focus on:

Platform-Specific Strategies: Use each platform's respective content and engagement strategy to match the unique audience behaviors and preferences of that platform's algorithm. For instance, spend on excellent music videos and exclusive content on YouTube, make attention grabbing and trending short form content on TikTok and connect personally through good stories on Instagram.

Integrated Marketing Communication (IMC): Create cohesive campaigns across multiple platforms with work that supports and enhances work on another. As an example, you probably saw a TikTok challenge, followed by a YouTube video released and a Spotify playlist addition.

Long-Term Engagement Planning: Recognizing the concept of time-lag and planning campaigns with a combination of immediate and lingering engagement efforts are also important. This includes releasing content on a regular basis, being active on a regular basis on social media, and using follower growth on content platforms to drive constant improvements.

Cross-Platform Synergies: By using the interplay between content, interaction, and follower metrics you can improve overall performance. Ask people to engage with you socially, and send that social traffic to content platforms and leverage the follower metrics on those platforms to maintain future engagement and revenue growth.

Through the implementation of these strategies, K-pop groups would realize effective usage of the complex field of digital to enhance their performance outcomes and present a competitive advantage in the world-wide music industry. Finally, the study presents practical recommendations for the use of digital engagement metrics to guide both short-term visibility and long-term success of K-pop groups in their digital evolution.

CHAPTER 6: CONCLUSION

6.1. Summary

The impact of platform specific engagement metrics on K-pop group performance outcomes was investigated with the aim of understanding the dynamics between content consumption with user interactions in relation to user growth in different digital platforms. The study investigates the tie between variables using Structural Equation Modeling (SEM) and explores immediate and time lagged effects employing regression analysis and SEM. The findings can be summarized as follows:

Platform-Specific Dynamics: The results showed marked differentiation in performance outcomes between platforms, with YouTube and Spotify being the principal drivers of revenue and sustained participation. I found that YouTube Channel Views (V1) and Spotify Followers (Fc4) had the largest direct effect on proceeds, while TikTok (I1) and Instagram (Fs1) instead had indirect effects by facilitating amplification of visibility and directing traffic to primary content platforms.

Temporal Effects of Engagement: Digital engagement was found to be a critical component and manifested itself as time-lag effects. TikTok Likes (I1) and Facebook Talks (I2) were found to have a delayed yet important effect on several performance outcomes, like Spotify Followers (Fc4) and YouTube Subscribers (Fc1). These findings drive home the point that companies should address digital marketing long term, as short bursts of engagement don't necessarily correlate with actionable results immediately.

Interplay of Content, Interaction, and Follower Metrics: Of all variables, follower metrics on a content platform (Fc) were one of the strongest predictors of proceeds. We find that while interactions (e.g., Tiktok Likes) and social media followers (e.g., Instagram Followers) are determinants of short — term engagement, the long — term effect of these exposures is partially through content

platform followers (e.g., Tiktok Followers, Instagram Followers, etc.). This emphasizes that it matters which platforms you prioritize, those who build a loyal and monetizable audience.

The implications were discussed based on these findings regarding the need for an integrated marketing strategy which benefits by capitalizing on the unique strengths of each platform. The study also offers actionable recommendations for marketers on cross platform continuity, long term campaign planning and high-quality feed.

6.2. Contributions and Innovations

This study contributes to the existing body of literature on digital music marketing and platform engagement in several key ways:

Advancing Platform-Specific Analysis: Previous studies have of course focused on the overall impact of digital platforms, while this work instead produces a granular analysis of platform dynamics. The study separates content platforms (YouTube, Spotify) from social media platforms (Instagram, TikTok) to see how individual platforms influence performance outcomes.

Incorporating Temporal Dynamics: Unlike most current studies, this research designed a time-lagged analysis to result the delayed impacts of engagement metrics. In addition to revealing the temporal dynamics of audience behavior, this innovation suggests a framework for formulating more strategic long-term marketing.

Exploring Interconnected Variables: Through the application of Structural Equation Modeling (SEM), direct and indirect effects were identified and further revealed the mediating capability of interactions and social media metrics. This also advances our understanding of how different engagement metrics impact performance in an additive way, closing some gaps in the literature on cross-platform synergies.

Empirical Focus on K-pop Groups: This study contributes to the growing body of Hallyu research by examining K-pop groups, a world—famous segment of the music industry. Specifically speaking, the findings of this paper present K-Pop strategies that are behind their global success and can be a benchmark for music industry and genre as a whole.

6.3. Limitations and Future Research Directions

This study brings forth useful results, but is not exempt from shortcomings. These limitations should be considered when interpreting the findings and designing future research:

Expanding Sample Scope:

With nine K pop groups, this research is a good starting point to understand digital engagement in the K pop industry. Future studies can extend the scope of this work by expanding the range of music genres and markets studied, including Western pop or indie artists, to validate and expand the applicability of the results to varied musical terrains.

Integrating Offline Engagement Metrics:

Digital engagement metrics are the focus of the current analysis and provide critical audience behavior insights online. But offline activities could be included, for example concerts, fan meetings and merchandise sales, to give a more complete picture of the artist's performance. This is the downside and future research could take a mixed method approach to capture the interplay between online and offline engagement.

Exploring Regional Audience Dynamics:

Although this study focuses on global performance metrics, future research can explore the dynamics on a regional basis, to understand how audience behavior and platform preferences diverge across markets. By looking at regional characteristics we can investigate how K-pop group strategies might differ across

Western and Asian markets in order to pursue the greatest global reach.

Adapting to Platform Algorithm Changes:

The content visibility and engagement on digital platforms are often updated by the algorithms. Future studies could bring in algorithmic change or external factor (e.g., new platform launches, global event etc.) into models to understand how this would impact the audience engagement and artist performance.

Developing Group Classification and Targeted Strategies:

However, future research can model the nine K-pop groups by their pattern of engagement, and the corresponding performances. By classifying groups (e.g., emerging vs. established), it will be possible to build more tailored marketing strategies, for example, newer groups can be targeted with aggressive social media campaigns, and established groups can focus on content driven strategies on streaming platforms.

Incorporating Textual Content Analysis:

Quantitative metrics of engagement provide data about how engaged an audience is, but don't say anything about whether that audience is happy or responsive, or how they might be responding to what is happening. Examining user comments and textual feedback could reveal deeper insights into audience sentiment or where trends are emerging. Sentiment analysis and/or natural language processing (NLP) can be used in future studies to analyze user comments across platforms to offer a more in depth understanding of fan engagement, and help us better understand optimal content development and marketing of this content, at scale.

By understanding these areas, future research can help us gain even greater insights into how digital engagement strategies can lead to success in the global music industry, providing even more actionable insights for artists, marketers, and industry stakeholders.

References

- Anderson, T., Brown, J., & Taylor, K. (2021). *The Dynamics of Digital Music Consumption*. Oxford University Press.
- Barker, R., Chen, J., & Zhao, M. (2022). "Youth Culture and Platform Preferences in Global Music Markets." *Journal of Cultural Studies*, 19(3), 320-340.
- Brown, J., & Taylor, K. (2022). "Time-Lag Effects in Social Media Campaigns: A Quantitative Analysis." *Digital Marketing Quarterly*, 15(2), 45-67.
- Chen, J., & Zhao, M. (2020). "The Role of TikTok in Global Music Promotion." *Media Studies Review*, 14(4), 401-421.
- Clark, L. (2020). "Content Strategies for Music Videos on Social Media Platforms." *Music Marketing Journal*, 12(1), 56-70.
- Gordon, P., Kim, J., & Lee, H. (2020). "Algorithmic Challenges in Multi-Platform Marketing." *Journal of Digital Strategy*, 22(5), 215-230.
- Johnson, D., Martin, A., & Patel, R. (2017). "Temporal Dynamics of Audience Engagement: A Multi-Platform Perspective." *Marketing Insights*, 18(2), 98-115.
- Jones, A. (2019). "Cross-Platform Consistency and Fan Retention: A Comparative Content Analysis." *International Journal of Music Marketing*, 7(3), 150-169.
- Kim, J. (2021). *Algorithmic Visibility in the Digital Music Era*. Cambridge University Press.
- Kim, S., & Park, H. (2020). "The Influence of Interaction Metrics on Digital Campaign Success." *Interactive Marketing Journal*, 11(3), 210-233.
- Lee, S., Park, M., & Zhao, L. (2018). "Visual Storytelling in K-pop Music Videos." *Asian Popular Culture Journal*, 9(2), 144-165.
- Lin, J., Nguyen, T., & Tran, P. (2020). "Short-Term Campaigns vs. Long-Term Strategies: A Meta-Analysis." *Marketing Science Review*, 29(1), 101-120.
- Lopez, C., Rahman, S., & Tran, P. (2019). "Measuring the Impact of Instagram Campaigns on Brand Engagement." *Journal of Social Media Studies*, 8(4), 378-390.

- Martin, A. (2018). "Delayed Effects in Social Media Marketing: A Systematic Review." *Digital Consumer Research*, 9(2), 76-90.
- Miller, R., Smith, J., & Zhao, M. (2019). "Digital Music Metrics: Beyond Followers and Likes." *Journal of Media Economics*, 15(3), 222-239.
- Mitchell, L. (2021). "The Challenges of Managing Multi-Platform Audiences in the Music Industry." *Digital Entertainment Review*, 10(1), 58-72.
- Nguyen, T., & Tran, P. (2021). "The Ripple Effect: TikTok's Influence on Music Streaming." *Media Studies Quarterly*, 19(1), 12-28.
- Park, S., & Lee, C. (2019). "The Korean Wave and Its Economic Impact." *Journal of Global Cultural Studies*, 25(4), 322-340.
- Rahman, S., Lopez, C., & Miller, R. (2021). "Synergistic Marketing in the Streaming Era: A Case Study of Emerging Artists." *Music Business Journal*, 13(2), 89-110.
- Sharma, K., & Patel, R. (2020). "Exploring Temporal Engagement in Digital Marketing." *Journal of Business Strategy*, 27(5), 103-117.
- Smith, J., Jones, A., & Walker, B. (2020). *Integrated Marketing Communications in the Digital Era*. Routledge.
- Tanaka, Y. (2020). "Regional Dynamics in Digital Music Consumption." *Asian Business Review*, 30(3), 45-62.
- Walker, B. (2018). "Understanding Audience Demographics on Social Media Platforms." *Marketing Research Insights*, 14(2), 87-103.
- Zhao, L., & Kim, J. (2021). "The Role of Engagement Metrics in Digital Music Performance." *Journal of Digital Culture Studies*, 16(2), 203-217.

ACKNOWLEDGEMENT

I would like to express my deepest gratitude to my thesis advisor, Prof. Inoue of Keio Business School (KBS) at Keio University, for his insightful mentorship and unwavering support. His guidance has been invaluable throughout my research and writing journey.

I am also sincerely grateful to Prof. Sakashita and Assoc. Prof. Onishi, as sub-chief examiners, for their constructive feedback and thoughtful suggestions, which greatly enhanced my work.

Furthermore, I deeply appreciate my seminar members and classmates for their intellectual exchange and encouragement. A special thanks to Mr. Shinozaki, Miss Tachibana, Mr. Kozawa, Miss Liu, and the 7 Family, whose steadfast support has been invaluable to me. I am also profoundly grateful to my beloved parents, whose unwavering encouragement has been my greatest source of strength.

This accomplishment would not have been possible without them. I am truly thankful.

Author

王 露曦 (L. Wang)