Climbing the Charts Without Fandom: An Analysis of the "Reverse Run" Phenomenon in the K-Pop Scene

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Abstract: *"Reverse run" in K-pop refers to the sudden rise in popularity of a fading song, which is often triggered by memetic videos on YouTube. In this study, we argue that this cultural diffusion is possible without resources of giant agencies or fanbases because individuals are loosely and flexibly connected through digital networks. To test this claim, we collected 1,308 YouTube videos and 611,809 comments on them. We then analyzed user engagement with these videos. For the reverse run case, there was an extensive user engagement with memetic videos that covered, mimicked, or remixed idol groups' music videos or media-produced stage footage, which drove virality. This pattern differed from those of other immediate chart-toppers, which often resulted from big agency promotions or strong fan support. This study indicates that memetic videos play a crucial role in the bottom-up cultural diffusion of reverse run by creating a fandom-like phenomenon where individuals could connect through personalized expression.*

Keywords: K-Pop Scene; Cultural Diffusion; User Engagement; Fandom; Connective Action

1. Introduction

The K-Pop industry, which has grown rapidly with the Korean Wave since 2010, features fierce competition among giant agencies. It has been argued that the excessive commoditization and homogenization of idol groups hinder cultural diversity and dynamicity [1-3]. Moreover, in the highly industrialized K-Pop market, the top-down flow of content from agencies and broadcasting media may encourage passive and blind fandom, leading to a rigid and closed culture [4-6]. Yet, fandom has also played an active role in K-Pop's global expansion, as evidenced by BTS's success, which would not have been possible without a strong fanbase [7, 8]. Fandom allows a self-chosen group of people to select and reinterpret specific mass-produced entertainment elements, creating a unique and intense popular culture that is both similar to and distinct from that of more mainstream audiences [9].

Fans are highly skilled at organizing and mobilizing collective action to support their idols. Their shared identity and voluntary commitment create a cultural phenomenon that garners mass attention and often constructs a counter-hegemonic culture [10]. Their influence extends beyond the individual to the collective, as fans collectively purchase albums in bulk when their idols release new music or launch an "all-out attack on streaming" to boost song rankings by playing songs repeatedly online, produce derivative merchandise, raise funds, and place supportive advertisements in public spaces [11]. As "digital natives" adept at using smartphones and social media, fans often form a collective identity through transnational and interactive internet communication, enjoying content, exchanging opinions and emotions, and coordinating actions [8], [12]. Consequently, K-Pop idols and their agencies actively engage in direct communication with fans using online platforms to attract new followers and strengthen fandom identity [13].

The rise of fandom as a collective behavioral force on digital platforms has decisively impacted online streaming music rankings. This is especially true for YouTube, where the rapid spread of content is critical given the K-Pop market's short popularity cycle. Here, virality refers to the rapid spread of content, products, or ideas through the Internet, where users freely interact and share information [14, 15]. In response, idol

agencies release music videos (MVs) on their official YouTube channels, post teaser videos to increase attention, and create personal videos of their members to attract fans. Additionally, mass media entities use their YouTube channels to boost views and subscribers by featuring stage videos of idol groups or individual members. This top-down flow of cultural content, combined with the fandom's strong collective identity, creates an explosion of virality and contributes to the rise of idol music in the K-Pop market.

However, the K-Pop market on YouTube represents more than a cultural phenomenon driven solely by top-down content distribution. There is also a unique phenomenon called "reverse run," which refers to a situation in which a song—originally released without strong agency backing or an established fanbase—later experiences an unexpected surge in popularity through organic, bottom-up diffusion driven by user-generated memetic content. Although this phenomenon has primarily been associated with relatively unknown idol groups—exemplified by Brave Girls' "Rollin'"—the underlying mechanism is not inherently limited to such cases; similar patterns of resurgence may occur with well-known artists (e.g., Rain's "Gang") when viral, fan-driven reinterpretations spark renewed interest.

At the center of this phenomenon is virality on YouTube. This study argues that memetic videos, which are freely (re)produced and disseminated on YouTube, initiate the reverse run phenomenon as a bottom-up cultural flow driven by individual users and facilitate the formation of a fandom. Memetic videos are the product of mimesis—the creation of derivative content that imitates the original—and they underscore the transition of YouTube users from passive receivers to active producers and participants [15].

Our attention to the reverse run phenomenon emphasizes the need for empirical research on its mechanisms and processes of virality in memetic videos. A female idol group's "Rollin'" provides the perfect case, as it unexpectedly topped the 2021 charts four years after its initial release, turning an unknown group into a cultural icon. However, few studies have explicated the role of memetic videos in bottom-up, individual-driven cultural diffusion versus top-down, agency- or mass-media-driven diffusion. This study fills that gap by analyzing how cultural diffusion occurs through the personalized expression of memetic videos on YouTube, applying social network analysis to track the flow of user engagement as revealed by commenting patterns, and determining the socio-cultural implications of the reverse run phenomenon in the K-Pop market. To clearly outline the framework of this study, the key research components are summarized in Table 1.

Table 1. Research Framework and Key Components

Component	Description
Research Methodology	Quantitative analysis of YouTube videos and comments; categorization of video genres (official, original, fancam, remixing, participation, evaluation); and social network analysis to track user engagement patterns.
Research Question	1. What are the distinctive characteristics of the cultural diffusion of reverse run? 2. What role do memetic videos play in creating virality?
Research Purpose	To investigate the bottom-up process of cultural diffusion in the reverse run phenomenon and understand how memetic videos drive virality in the K-pop scene.
Object of Study	K-pop songs that experience reverse run (with a focus on Brave Girls' "Rollin'") and related YouTube content, including both memetic and non-memetic video genres.

2. Theoretical Background

2.1 How is Idol Music Promoted and Why is it Popular in the K-Pop Scene?

Since the 2000s, South Korea has emerged as a cultural powerhouse in the drama, film, and music industries, fueling the Korean Wave. This phenomenon has often been conceptualized as a "song camp," where production values, stylistic choices, and promotional strategies converge to create a distinct cultural product. The Korean Wave, initially concentrated in Asia, became global with milestones such as Psy's "Gangnam Style" in 2012, which dramatically expanded the transnational scope of K-Pop [16]. Under the leadership of major agencies like SM, YG, JYP, and HYBE, the industrialization and globalization of K-Pop have transformed its music and MVs into complex cultural artifacts that both reflect and shape popular taste [17].

The competitive nature of the K-Pop industry compels agencies to adopt innovative promotional strategies. A notable example is SM Entertainment's female idol group Aespa, which debuted in 2020 with a groundbreaking concept that integrates virtual avatars as full members. These AI personas inhabit a fictional, digital realm—depicted as a wilderness where they battle a virtual entity called "Black Mamba"—introducing

a novel form of narrative and interactivity not commonly seen in other idol groups [18]. This emerging phenomenon not only diversifies the content but also redefines audience engagement by blending digital innovation with traditional pop culture elements.

Given the intense competition within the K-Pop idol market, achieving chart dominance upon release is critical. To stand out, agencies employ a marketing strategy that involves releasing multiple album versions simultaneously. Each version typically includes different key products—such as photo books, photo cards, and posters—designed to boost fan consumption and drive album sales [19, 20]. Fans often purchase numerous copies to collect various versions, secure privileges, or attend exclusive fan signing events [21]. This practice, which continues to influence the market, underscores the commercial acumen behind the diversification strategy. According to the initial sales figures for the first week in 2023, the male idol group Seventeen's mini 10th album FML sold 4.55 million copies, followed by Stray Kids' full-length album 5-Star, which sold 4.61 million copies, reversing the first place in history within a month [22].

Korean idol agencies leverage the power of social media to distribute official content and interact with global audiences [17, 18]. Platforms such as YouTube and Twitter facilitate the real-time monitoring of social media metrics—including video views, downloads, and engagement indicators—which allow agencies to gauge public response [1, 2], [7], [23]. Furthermore, agencies actively use fan communication platforms like Weverse, Bubble, and UNIVERSE to manage one-on-one interactions with fans. This approach is particularly crucial for new idols who must maximize public exposure and organically build a fanbase in a highly saturated market.

Finally, traditional methods of mobilizing fans remain a cornerstone of K-Pop promotion. Agencies recruit official fan clubs to unify fans under a common identity, often providing them with designated names and symbolic colors. These fan clubs are encouraged to support their idols by purchasing merchandise and engaging in coordinated activities such as bulk album purchases and organized streaming attacks [24]. Such strategies not only boost the commercial performance of idols but also reinforce a collective identity that transforms individual fans into dedicated, influential consumers [11], [25].

2.2 How does Virality on YouTube Occur in Climbing the Charts and the Reverse Run Phenomenon?

The entertainment agency strategies discussed above represent the top-down mobilization of K-Pop fandoms to support idols by purchasing albums, streaming MVs, attending fan events, and voting during releases, all with the aim of winning music awards or securing an artist's media presence and trends [11]. In these processes, fans devote significant time and resources to attract public attention via digital media [20]. Idol fans organize themselves into teams, set systematic goals in the online music marketplace, and use their organizational skills to wage an "all-out attack on streaming" by repeatedly playing their favorite groups' music to achieve new records or boost song rankings [11], [20]. Thus, YouTube not only serves as a platform for enjoying MVs and related content but also as a means for fans to actively participate in and drive virality, thereby promoting popularity trends [7].

As the world's largest video-sharing platform, YouTube allows any individual to post videos easily and even generate revenue based on viewer engagement [26]. In this environment, K-Pop idol music circulates not only through official MVs and stage videos but also as secondary works—individual imitations or reworkings of a song's music or dance. In other words, on YouTube, memetic videos are fan-generated content that repackages idol music in various forms, inviting participation from multiple creators in content distribution [27]. These secondary creations, produced by mimicking or remixing the original, tend to exhibit a more diverse and creative, albeit amateurish, quality compared to professionally produced MVs and stage videos.

More importantly, memetic videos—which "generate extensive user engagement by way of creative derivatives" [15]—offer a more nuanced framework than viral videos for explaining bottom-up cultural diffusion on platforms like YouTube. Unlike virality, which emphasizes the mechanics and breadth of content dissemination [28], memetic videos epitomize a participatory culture that thrives on user-generated imitations, parodies, and mash-ups. YouTube, as a digital space, not only enables official channels and agencies to promote content through top-down diffusion but also empowers individual users to create and share derivative works, thereby fueling a dynamic bottom-up exchange.

According to [12], participatory culture is "a culture that invites other consumers to actively participate in the creation and distribution of new content." In this context, memetic videos—transformed, repurposed, and proliferated in diverse forms—exemplify how social media platforms facilitate both organized promotional strategies and spontaneous, grassroots community engagement. Ultimately, these videos allow individual users

to form loose yet expansive communities, fostering a participatory culture of fandom that both challenges and complements traditional top-down content distribution.

Memetic videos can be categorized into several genres depending on their method and purpose [27]. The first category is fancams, which capture idols performing on stage or with their members from the fan's perspective. This genre is popular because it offers a direct, personal view of the performance, although it typically reveals little about the creator's intention, making it the least creative form of memetic video. The second genre is remixing videos. In this study, "remixing" refers to user-generated re-edited versions of original content—such as clips that incorporate background music or altered lyrics—to create a new version of the video, distinct from professionally produced DJ remixes. This genre reflects a greater degree of the creator's perspective and creativity compared to fancams [29].

The third genre is participation videos, where the creator performs the song or sets the stage—alone or with other performers—without featuring the original idol or song. This category, which includes cover and dance videos, demonstrates a higher creative element due to the reinterpretation of the original work [27]. The final category is evaluation videos, which show fans' reactions to or critiques of the original song or performance. This genre is characterized by the most creative elements, as it centers on individual perspectives that may differ from the agency's intended narrative [23].

To sum up, in the K-Pop idol industry, giant agencies rely on mobilizing strong fandoms to drive top-down content distribution and coordinated participation, thereby generating YouTube virality. In contrast, the reverse run phenomenon is characterized by bottom-up cultural diffusion driven by individual users through the spontaneous spread of memetic videos. Therefore, this study examines whether a reverse run case exhibits a distinctive viral pattern on YouTube and, in doing so, forms a fandom through extensive user engagement with memetic videos. To achieve this, we compare a reverse run case with other hit song cases to reveal the role of memetic videos in generating virality as a form of cultural diffusion.

2.3 Reverse Run as a New Paradigm of Virality and Fandom Engagement in the K-Pop Scene

To examine the role of memetic videos in cultural diffusion, this study focuses on commenters who engage with the phenomenon of climbing the charts. On YouTube, user interactions include "liking" or "disliking" videos, "subscribing" to channels, and "sharing" videos on social networks [30]. Among these behaviors, commenting is considered the most active form of engagement. According to [30], behavioral engagement on YouTube can be divided into two dimensions: consumption and participation. Consumptive engagement refers to passive behaviors such as watching videos, viewing "likes," and reading comments, whereas participative engagement involves more active interactions among users and with content [31].

Commenting allows users to express their sentiments and attitudes toward content; consequently, both other users and publishers may interpret comments as reflective of public opinion and as an indicator of media influence [32]. Furthermore, K-Pop fans express their affection and loyalty by posting positive comments on their idols' MVs to create a favorable public opinion [7]. Thus, commenting is a critical way for YouTube users to experience K-Pop idol culture and drive popularity.

Virality on YouTube is influenced not only by view counts but also by the extent of user interactions, such as the number of comments a video receives [33]. Fans are often eager to play and comment on both official MVs and various derivative video clips; their collective activity can become an organized force that generates virality. In contrast, the reverse run phenomenon occurs when virality emerges without the coordinated activity of a pre-existing large fan base or the top-down strategies of idol agencies.

Instead, reverse run manifests as bottom-up virality driven by extensive user engagement with memetic videos, ultimately leading to mass popularity. In other words, memetic videos provide the mechanism for reverse run as a form of cultural diffusion propelled by individual producers and consumers on YouTube. From this perspective, these videos serve as a medium for participatory culture, where content is both produced and consumed at the level of personal expression, thereby facilitating virality [15], [27]. How, then, does the reverse run phenomenon occur without the collective action typically associated with organized fandom?

This study explains the mechanism of the reverse run phenomenon through the lens of connective action, which suggests that personalized voices on social media can be loosely and flexibly coordinated into a collective experience that eventually forms a group identity [34]. In this framework, memes act as a medium by which personalized engagement is channeled into connective action around shared interests and identities. Connective action through memes thus describes a cultural phenomenon in which self-motivated individuals form and

participate as a group without the need for formal organization or a shared ideology—factors traditionally central to collective action [35].

In this view, the virality of reverse run differs significantly from traditional K-Pop virality, which relies on strong fan unity, loyalty, and the organizational support of agencies to mobilize fan participation through efficient resource allocation and leadership. This suggests that reverse run occurs as a result of a novel method of fandom formation in which memes act as cultural symbols, driving user engagement and collective experiences from the bottom up. However, the specific role of memetic videos in the bottom-up cultural diffusion of reverse run remains unclear. The research question is, therefore, as follows:

RQ: What are the distinctive characteristics of the cultural diffusion of reverse run, and what role do memetic videos play in creating virality?

3. Materials and Methods

3.1 Case Selection

The study compared the reverse run case with other songs that became popular around the same time but achieved success through a pre-existing fanbase or promotional strategies driven by idol agencies. All these songs reached the top spot on Melon, South Korea's leading music streaming service, between 2021 and 2022. The cases were categorized based on their chart performance—considering both immediate success and reverse run—with the presence of a pre-existing fanbase or major agency promotions inferred from previous chart-topping songs.

First, Brave Girls' "Rollin'" exemplifies the reverse run phenomenon, as it gained popularity through a viral YouTube clip despite lacking a formal fanbase or major label support. This contrasts with songs that achieve immediate chart-topping through organized fandom or agency-driven promotion. In contrast, IVE's "After LIKE" represents traditional success, topping the charts upon release due to a strong fanbase and robust support from their major agency, Starship. "Attention" by NewJeans—despite the group not having a strong fanbase—quickly reached number one thanks to the strategic promotion provided by the leading K-Pop agency, HYBE. The final comparative case is Younha's "Event Horizon," which climbed the charts months after release, leveraging the momentum of an already established fanbase.

3.2 Data Collection

We collected data from publicly available YouTube videos and comments to compare the reverse run phenomenon with other hit cases in terms of the patterns and structures of their digital networks. This study focused on the role of user engagement—specifically, commenting on video clips—in the cultural diffusion of K-Pop idol music distributed on YouTube as official MVs, stage videos, and memetic videos.

To gather data, we searched for all relevant, non-duplicative clips for each case using the idol's name and the song title (e.g., "Brave Girls" and "Rollin'") as keywords in Korean. We selected only those clips that had at least two user comments. Next, we used the YouTube API to collect information about each video and its associated comments. We extracted each video's ID, publication date, the unique ID of each commenter, and the timestamp of each comment.

Table 2. Summary of YouTube Videos and User Engagement

Artist	Song Title	# of Clips	Comments (Total)	Commenter IDs	Period (6 weeks)
Brave Girls	Rollin'	390	241,280	123,805	2/28/2021–4/10/2021
IVE	After LIKE	363	276,728	115,900	8/21/2022–10/1/2022
NewJeans	Attention	221	70,209	42,843	8/7/2022–9/17/2022
Younha	Event Horizon	334	22,872	17,773	10/30/2022–12/10/2022

For each case, we selected videos that were commented on during the period from two weeks before to four weeks after the song reached the top of the charts. This six-week data collection period was sufficient to

capture the virality of each hit song, given the fast-paced nature of the K-Pop market. In fact, we found that the number of comments on related YouTube videos dropped significantly during the three weeks following the song's peak. Table 2 summarizes the YouTube clips and commentary information.

3.3 Video Categorization

To examine the role of memetic videos in the reverse run phenomenon, we categorized the collected YouTube clips into the following six genres, drawing on [27], according to the characteristics of the publisher and the content of the clip: 1) official videos (e.g., MVs posted on idol agencies' YouTube channels); 2) original videos (e.g., stage videos posted on YouTube channels of mass media entities); 3) fancam videos (e.g., direct cam clips shot by individual users); 4) remixing videos (e.g., clips with background music or lyrics using the original song); 5) participation videos (e.g., clips in which users created their own videos, such as dancing to the original song or using musical instruments); and 6) evaluation videos (e.g., clips that critique the original song or fan reactions).

Two graduate students coded each collected clip to categorize them. After several pilot tests on the genre classification of 200 clips (about 15% of the total), their inter-coder reliability reached 0.916 both in Cohen's Kappa and Krippendorff's Alpha.

3.4 Analysis

For the YouTube clips categorized by genre, we longitudinally tracked trends in commenting over the virality period to compare user engagement in each case. To do this, we referenced the posting time information of the comments on the YouTube clips to derive the number of comments for each video genre and then compared each case, which allowed us to capture how the reverse run case differs from other idol hit cases in terms of video genre engagement and virality trends.

Next, we captured the role of memetic videos in generating fandom for a reverse run by comparing how users connect the different genres of each song's YouTube clips. Specifically, we examined whether the bottom-up flow characteristic of reverse run was marked by an expansion of user engagement with memetic videos (fancam, remixing, participation, and evaluation genres) that then extended to the official or original video genres, which are non-memetic in nature. In contrast, the top-down flow of traditional idol culture diffusion is presumed to be characterized by intensive yet exclusive engagement with official or original video genres.

To assess these dynamics, we employed social network analysis by constructing a directed, valued network structure of connections between YouTube clips. A connection was defined as an instance in which the same user commented on any pair of clips—the greater the number of shared commenters, the stronger the connection. By incorporating the timestamp of a user's first comment on each clip, we assigned directionality to the edges between nodes (clips), thereby capturing the flow of engagement over time. Additionally, key network metrics such as node centrality and density were calculated to quantify the influence of memetic videos relative to official or original videos. These metrics provided a clearer picture of how user engagement flows from one video genre to another, distinguishing the bottom-up diffusion observed in reverse run cases from the top-down diffusion in other hit songs.

Finally, for each hit song's clip connection network, we subset the nodes and generated four block structures: (memetic videos × memetic videos), (memetic videos × non-memetic videos), (non-memetic videos × memetic videos), and (non-memetic videos × non-memetic videos). Each matrix represents the number of shared commenters on preceding and following videos.

By measuring the density of each block in the clip connection network, we examined whether the role of memetic videos in user engagement differed between the reverse run and other hit cases. If memetic videos encourage cultural diffusion, the block density would be greater in (non-memetic videos × memetic videos) than in (memetic videos × non-memetic videos). This pattern would suggest that user engagement with memetic videos more frequently leads to subsequent engagement with non-memetic videos than vice versa. Thus, we statistically tested whether the density of each block structure is equal to that of the overall network by implementing the bootstrapping method as described in [36]. Here, block density refers to the proportion of existing connections relative to all possible connections [37].

4. Results

We first measured how user engagement with YouTube clips from each video genre changed over time and compared the hit song cases. Figure 1 shows the commenting trends for "Rollin'" (a reverse run case) and the three comparison songs over a six-week period—from two weeks before to four weeks after reaching #1. Notably, for "Rollin'," the evaluation genre had the most commenters two weeks before reaching #1, whereas for the other songs, the original genre led in commenters at that time. In "Rollin'," the original genre ranked fifth two weeks before #1, then fluctuated, eventually becoming the highest by the time the song reached #1.
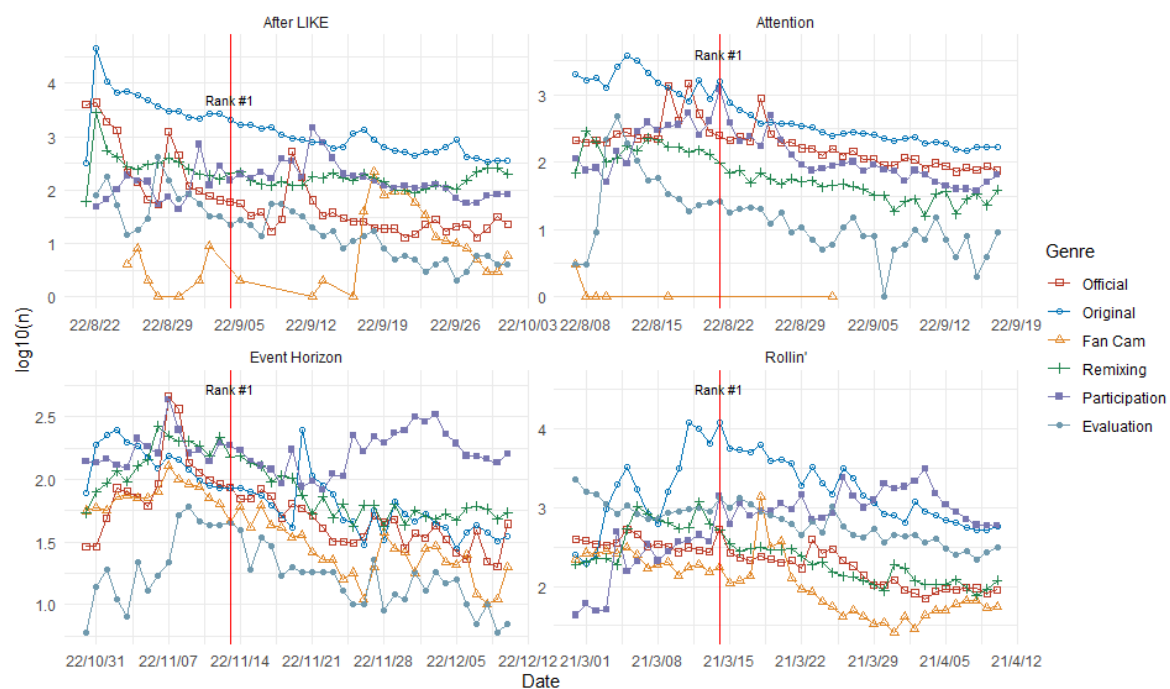
**Figure 1.** Commenting Trends on YouTube Videos of Hit Songs in the K-Pop Scene.

Two weeks after reaching the top, "Rollin'" experienced the highest number of commenters in the participation genre. Although this genre had the fewest commenters two weeks before reaching #1, its numbers gradually increased, eventually surpassing those in the original genre. The fancam genre's commenters increased after the first week, making it the second highest overall, though it remained the lowest for most of the period. Additionally, the official genre consistently received the fewest comments. The remixing genre ranked second before the song reached #1 but then decreased in commenter count afterward.

"Rollin'" also demonstrated a crossover of genres with high commenter counts over time. This trend differs from those of "After LIKE" and "Attention," which generally showed a rightward trend in the number of commenters. However, "Rollin'" exhibited a pattern similar to "Event Horizon," with a noticeable increase in participation genre comments after reaching #1. Moreover, for both "Rollin'" and "Event Horizon," the original genre was less prominent, while the fancam genre attracted more comments than in the other hit cases. Notably, "Rollin'" maintained very minimal engagement in the official genre throughout, unlike the other songs that experienced increased official genre commenting before reaching #1. Additionally, in "Rollin'," the evaluation genre consistently ranked among the top three in commenter count, whereas it remained at the bottom for the other songs.

These findings suggest that in the cases of "After LIKE" and "Attention"—which reached #1 immediately after release—user engagement was high in top-down content such as official and original videos. In contrast, "Rollin'" took a long time to reach #1 due to a lack of fandom support, with user-generated memetic videos playing a crucial role in its virality. Specifically, before reaching #1, "Rollin'" experienced relatively high engagement with bottom-up content (e.g., evaluation and remixing genres), and the number of commenters on participation-genre clips gradually increased, eventually becoming the highest two weeks after reaching #1. These patterns indicate that the reverse run dynamic is driven by the virality of memetic videos.

To further explore genre connections within and between YouTube videos, Figure 2 depicts networks derived from co-commenting patterns by users. These networks illustrate the direction and strength of inter-genre connections, with node sizes representing the number of videos per genre and edge thickness indicating the degree of shared commenters.

For "After LIKE," representing top-down cultural diffusion driven by a major agency and strong fan support, connections among non-memetic videos were much stronger than those between non-memetic and memetic videos. Specifically, the flow from the original to the official genre and vice versa accounted for 29.6% and 26.9% of all 9,930 connections, respectively. The fancam-to-official flow was 10.6% and nearly balanced by the official-to-fancam flow at 10.5%. Other cross-genre flows were significantly lower, suggesting that the song's popularity was driven by engagement within the official and original genres.
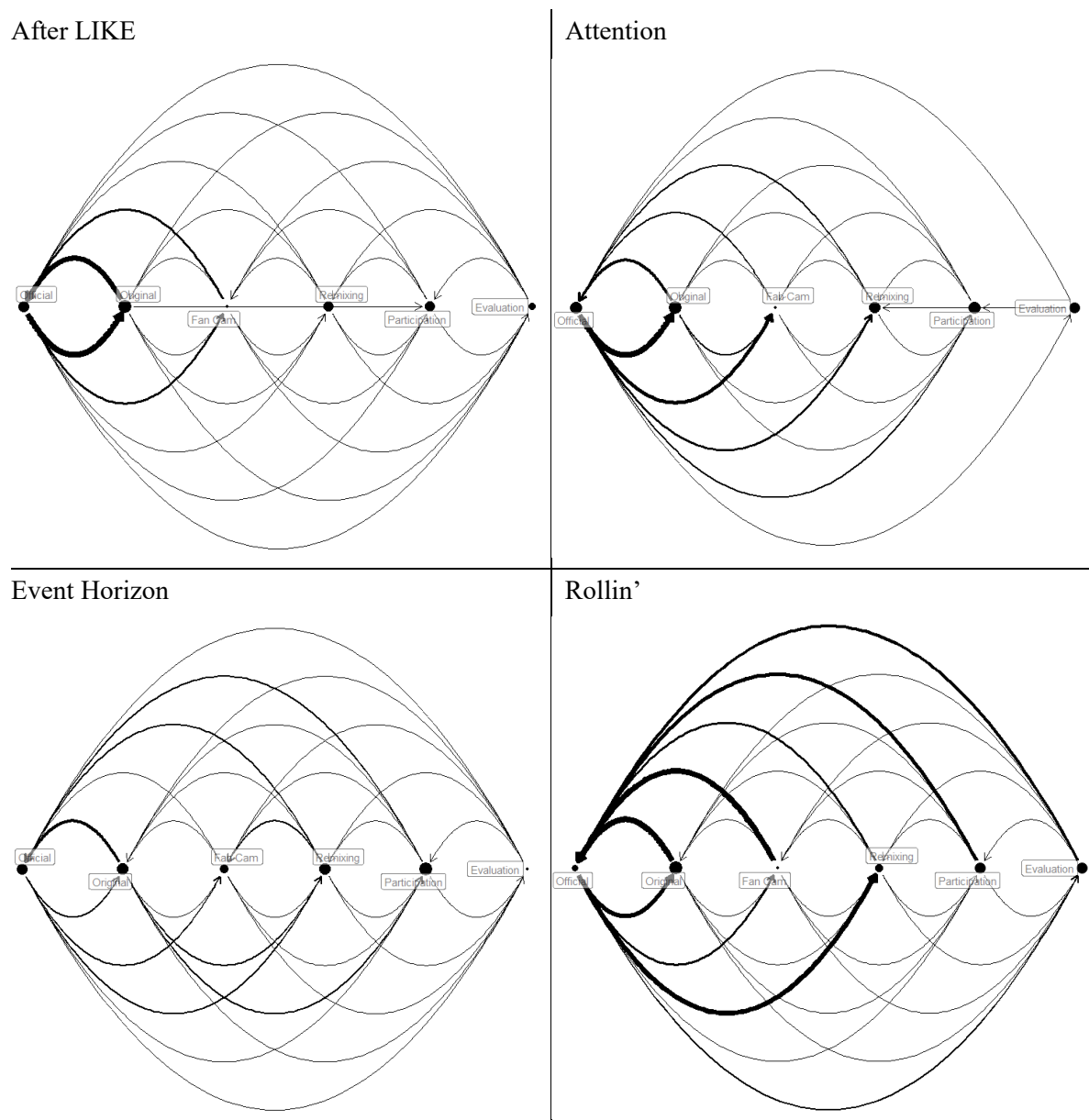
Figure 2. Directed Weighted Networks of Video Genres Connected by Co-Commenting In each network, a node represents the number of videos connected to one another, and a directed edge indicates the log-scaled number of commenters on both genres.

"Attention" showed a similar trend, with the highest official-to-original genre flow rate of 31.3% out of 3,493 connections. The next highest flow was from the original to the remixing genre at 16.6%, followed by a within-genre flow from the original to the official genre at 14%, and then the official-to-remixing flow at 9.62%. Other cross-genre flows were below 7%, indicating that virality of "Attention" was primarily generated around

official and original videos. However, as NewJeans had just debuted and lacked a strong fanbase, the influx of YouTube users into memetic videos also contributed to its success.

In contrast, "Event Horizon" was not as viral, and its overall genre flow was less pronounced. The most frequent flow was from the original to the official genre, accounting for 9.83% of 1,170 total connections; other genres exhibited similarly low flows (<7%), suggesting that "Event Horizon" represents neither organization-driven top-down diffusion nor bottom-up diffusion driven by individual YouTube memes.

For "Rollin'," representing the reverse run phenomenon, memetic videos played a leading role in the engagement flow. The flow from the original to the official genre accounted for 14.2% of 21,151 connections, while the fancam-to-official flow was 13.8%, and the participation-to-official flow was 9.65%. In the opposite direction, the official-to-fancam flow was only 6.03%, and the official-to-participation flow was just 1.51%. This pattern indicates that reverse run is a bottom-up cultural diffusion process: virality begins with personalized expressions via memetic videos, which then drive engagement with organization-led professional videos.

Statistical analysis further supports these observations. As shown in Table 3, the block structure of memetic and non-memetic videos indicates that users who commented on memetic videos were less likely to comment on other memetic videos subsequently. The directed block densities were 0.037 for "After LIKE," 0.051 for "Attention," 0.018 for "Event Horizon," and 0.083 for "Rollin'." Conversely, users commenting on non-memetic videos were more likely to engage with other non-memetic videos, with block densities of 0.809 for "After LIKE," 1.358 for "Attention," 0.903 for "Event Horizon," and 2.963 for "Rollin'." In all cases, these densities were significantly higher than the overall network density, indicating that non-memetic videos are more closely interconnected through user comments than memetic videos.

Table 3. Flow of Engagement Between/Within Non-Memetic and Memetic Videos in Terms of Block

	With Pre-Existing Fandom				**Without Pre-Existing Fandom**			
Big Agency	**After LIKE** Overall Network Density: 0.225		Videos Commented afterward		**Attention** Overall Network Density: 0.308		Videos Commented afterward	
			Non-memetic (n = 150)	Memetic (n = 170)			Non-memetic (n = 68)	Memetic (n = 98)
	Videos Commented First	Non-memetic (n = 150)	0.809*	0.101	Videos Commented First	Non-memetic (n = 68)	1.358**	0.186
		Memetic (n = 170)	0.059	0.037		Memetic (n = 98)	0.079	0.051
Small Agency	**Event Horizon** Overall Network Density: 0.041		Videos Commented afterward		**Rollin'** Overall Network Density: 0.394		Videos Commented afterward	
			Non-memetic (n = 20)	Memetic (n = 173)			Non-memetic (n = 89)	Memetic (n = 248)
	Videos Commented First	Non-memetic (n = 20)	0.903*	0.116***	Videos Commented First	Non-memetic (n = 89)	2.963**	0.331
		Memetic (n = 173)	0.077***	0.018		Memetic (n = 248)	0.407*	0.083

Furthermore, commenters on non-memetic videos were generally more likely to later comment on memetic videos than vice versa. The directed block densities between non-memetic and memetic videos were 0.101 for "After LIKE," 0.186 for "Attention," 0.116 for "Event Horizon," and 0.331 for "Rollin'." Notably, only in the "Event Horizon" case was this block density statistically higher than that of the overall network. In contrast, block densities from memetic to non-memetic videos were 0.059 for "After LIKE," 0.079 for "Attention," 0.077 for "Event Horizon," and 0.407 for "Rollin'." For "Rollin'," the density was not only significantly higher than for the other songs but also the only case where the density exceeded the overall network density. This indicates that, for "Rollin'," commenters on memetic videos were significantly more likely to comment on non-memetic videos than vice versa.

In summary, "Rollin'" is the only case demonstrating a bottom-up cultural diffusion driven by memetic videos. On YouTube, extensive user engagement with "Rollin'" memetic videos was followed by engagement

with official or original videos, which contributed to the song climbing the charts. This pattern starkly contrasts with other hits, where official video popularity typically led to subsequent meme production and amplification.

5. Discussion

Social media increasingly drives mass mobilization, and personalized expressions on these platforms often evolve into online activism. Memes on YouTube, in particular, play a crucial role in the formation of connective action. Through these cultural symbols, individuals are coordinated into large-scale action networks, mobilizing crowds for digital activism. In this process, identities emerge as diverse forms of personalized expression rather than strictly defined social groups [34]. In the case of reverse run—where a song by an unknown idol group suddenly goes viral—memes serve as cultural symbols that facilitate collective engagement, fueling the phenomenon's virality.

This study demonstrates that memetic videos on YouTube serve as a gateway for individual users to participate in content diffusion. Reverse run represents a bottom-up trend of cultural diffusion that differs from the conventional methods of achieving chart success, which rely on top-down diffusion driven by media companies or organized promotional strategies by idol agencies. We examined "Rollin'" as a representative case of reverse run by distinguishing official or original videos (such as MVs and broadcast stage videos) from memetic videos, then tracing the diffusion path through user engagement, as measured by commenting patterns. We compared "Rollin'" with other hit songs that achieved popularity via top-down cultural diffusion or organized fandom.

Our results support the claim that reverse run is driven by extensive user engagement with memetic videos. Analysis of YouTube commenting trends revealed that, for "Rollin'," there was significant engagement with memetic videos in the participation genre during the song's rise to the top of the charts. This pattern contrasts with other hit songs, where official or original videos drove popularity through pre-existing fan support or agency promotion. In the case of "Rollin'," the virality emerged bottom-up, with users engaging first with memetic content and subsequently with official or original videos.

Social network analysis further confirmed the central role of memetic videos in the bottom-up diffusion of reverse run. By mapping the flow of user engagement, we found that only for "Rollin'" did the network show a stronger flow from memetic videos (e.g., fancam, participation, evaluation genres) to official or original videos than the reverse. This finding indicates that, unlike traditional top-down strategies where professional content leads and memes follow, the virality of "Rollin'" was propelled by user-generated content that spurred further engagement with official material.

Importantly, the statistical analysis of network block densities reinforced these findings. For "Rollin'," the density of connections from memetic to non-memetic videos was significantly higher than vice versa, suggesting that user engagement with memetic videos directly contributed to the spread of official content. For other hits, however, the videos produced by the idol's agency or media organizations went viral first, followed by increased user engagement with memetic videos. This pattern underscores the unique nature of reverse run as a bottom-up cultural phenomenon driven by individual participation.

6. Conclusion

While our study illuminates the mechanisms behind the reverse run phenomenon, questions remain about its long-term impact. The case of Brave Girls' "Rollin'" illustrates that even significant viral success may be short-lived. Despite its dramatic chart ascent, the popularity of "Rollin'" did not translate into a sustained fanbase, and the group eventually disbanded. This raises important questions about whether reverse run can lead to long-term success or if it remains a transient trend driven by fleeting social media dynamics. Future research should explore factors that influence the sustainability of reverse run cases—such as the conditions under which meme diffusion transforms into enduring fandom—through comparative and longitudinal studies.

Nevertheless, this study offers important implications by demonstrating the role of memes in the bottom-up production and diffusion of participatory culture. On YouTube, memes are produced and distributed in the form of memetic videos that mimic, satirize, or re-edit elements of an original video through the active participation of individual users. Reference [15] argues that, compared to viral videos, memetic videos better highlight the active participation of users and the social meaning of cultural phenomena.

While participatory culture is not limited to memetic videos—viral videos also gain traction through features such as liking, sharing, and commenting—the vast majority of viral content in the K-Pop idol market

consists of MVs released via agencies' channels or professionally produced stage videos. Thus, viral videos are typically a tool for top-down cultural diffusion, in contrast to memetic videos, which are fan-driven cultural reproductions that facilitate bottom-up diffusion.

Furthermore, this study sheds light on reverse run as a phenomenon that reflects the dynamic cultural landscape of the K-Pop scene, driven from the bottom up by the spread of memes. The extensive dissemination of memes on video-sharing platforms creates a fandom-like cultural phenomenon in which crowds connect through personalized expression. Even without the organizing resources or professional strategies of a major agency or a cohesive fanbase, when memetic videos go viral, cultural diffusion occurs from the bottom up through individuals who are loosely but flexibly connected via digital networks.

Ultimately, our findings suggest that the huge success of "Rollin'" was attributable to a large-scale, loosely connected network of personalized expressions manifested in memes, enabling individuals of diverse social identities to participate in the reverse run phenomenon. In this view, reverse run is a form of connective action—not based on a socially cohesive group with a uniform identity, as seen in traditional fandoms—but rather on a coordinated network of memes that facilitates the connection and negotiation of personal identities.

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