

Neuropsychological Mechanisms in K-Pop Consumer Engagement: A Tripartite Analysis of Scarcity Tactics, Random Reward and Cultural Mixture

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Abstract: Head K-pop groups like BTS and BLACKPINK have successfully reconstructed consumers' psychological decision-making chain through phased album releases, random photocard strategy, and cultural hybrid marketing, but their long-term sustainability and ethical controversies urgently need systematic research. Since its rise in the 1990s, the K-pop industry has become one of the pillars of the South Korean economy. Yet, the market is currently facing issues like growing homogenized competition and an excessive reliance on the fan economy. The rebuilding mechanisms of K-pop's three main marketing techniques are the main topic of this study. Staged scarcity design, like the three-phase release of BLACKPINK's albums, creates an anxiety premium through dynamic supply control, which triggers the prefrontal cortex's (DLPFC) anticipated deficit effect. The Girls' Generation randomised photocard is an example of a random award mechanism that uses uncertainty cues to create recurrent interest in the album by triggering dopamine release in the nucleus accumbens (NAc) commissure. K-pop marketing reconstructs consumer psychology through the 'anxiety-reward-empathy' neural link, but its sustainability relies on the use of AI.

1 INTRODUCTION

Trot music, or "K-pop," as it is referred to outside of Korea, is a type of music that has its roots in pop music. After music Soman Lee established his company SM Entertainment, the music presently known as K-pop gained popularity in the 2000s (Bland, 2019). Thanks to its industrialized star-making system and globalization plan, K-pop has quickly transformed from a local music genre to a worldwide cultural phenomenon since Korea's economic boom in the 1990s. However, the K-pop industry faces a number of difficulties as market competition heats up and consumers' psychological tolerance rises. One of these is homogenized competition, where a lot of idol groups copy the headline strategy, which results in market saturation and erodes the advantages of differentiation. Concerns about the cultural discounting effect may also exist. Linguistic grafting and symbolic fusion are necessary to lessen cognitive conflicts because non-English content is less accepted in the European and

American markets. High-intensity hungry marketing and stochastic reward systems have been characterized as "exploitative tactics," which has resulted in fan fatigue and a crisis of confidence. Ethical controversy is another significant element. In light of this, how does K-pop use the technique of consumer psychological reconstruction to sustain its competitiveness on a worldwide scale? There are theoretical and practical implications to this study. At the theoretical level, this means dismantling the conventional marketing framework, combining the theories of consumer science, behavioral psychology, and neuroeconomics, and exposing the mutually beneficial mechanism of "phased scarcity," "random reward," and "cultural mixture" tactics. Practically speaking, by examining the successful HYBE and SM cases—like BTS's US entry strategy—a foundation for ethical transformation decision-making can be established, including transparent explosion rate and consumer cooling-off period, and the industry's sustainable growth can be encouraged. The following central questions are the subject of this

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investigation. Initially, the connection between phased shortage design and the activation of the prefrontal cortex (DLPFC) to generate an anxiety premium. How the nucleus accumbens (NAc) dopamine cycle is used in a random incentives technique to increase repurchase rates. Second, language grafting, such as how symbolic fusion and a 67% English lyrics share in the BTS lessen cultural discounting and trigger Temporal Parietal Junction (TPJ) empathic reactions. Finally, balancing neurostimulation intensity with ethical risk. How technology enablement extends the consumption lifecycle.

2 THE CASE OF K-POP'S MARKETING STRATEGY IN KOREA

2.1 Albums Released in Batches

Recently, BLACKPINK has implemented a phased album release strategy. For instance, their most recent album, BORN PINK, was released in three stages: digital, physical, and vinyl. The digital single was released first, followed by the physical album two weeks later, and then a limited edition vinyl with a VR concert code. This dynamic scarcity causes anxiety in the consumer. This tactic exploits fans' desire for "limited edition" exclusivity, leaves a void in social discourse between phases, builds fans' excitement for the next content phase, and activates the brain's loss aversion response and anticipation violation effect in the DLPFC, all of which increase customers' willingness to pay. The prefrontal area has expanded in size in comparison to the remainder of the cortex over evolution. Its greatest extent is found in the human brain, where it makes up 30% of the entire cortical area. Phylogenetic differentiation of cortical regions coincided with this expansion (Carlén, 2017). Sales of BLACKPINK's physical albums increased significantly as a result of this technique, with the vinyl version selling for 37 times more on the secondary market than the digital version.

2.2 Random Photocard Revolution

In 2007, Soan Lee, the founder of SM Entertainment, introduced the random photocard technique, which was initially featured in Girls' Generation's album "Into the New World." By embedding the photocards of various members, Lee stimulated consumers'

desire to collect, so creating a new model of K-pop fan economy. This tactic reorganized the psychological chain of customer decision-making in addition to altering the logic of music sales. The method creates a full loop of "consumption - socialization - investment" by using secondary market prices, like as the 37-fold premium for NCT's rare cards, together with customers' deep psychological requirements for scarcity and the urge to collect. In order to create emotional connections and transform consuming behavior into emotional involvement, random photocards, such as autographs and portraits, are created just for members. The introduction of fan-made and other self-printed photocards simultaneously satisfies the desire for personalization and transforms the photocard into a medium for expressing emotions. Album sales for SM Entertainment increased significantly as a result of this tactic. Soman Lee's random photocard technique effectively uses the triple process of brain reward, social fission, and emotional projection to convert consumer behavior into psychological reliance.

2.3 BTS's Market Strategy

By increasing the percentage of English lyrics and fusing American and European pop components, such as disco and hip-hop, BTS's approach for breaking into the U.S. is based on cultural grafting, which strengthens the cultural identities of the American and European markets. By entering the European and American markets, BTS dismantles the "cultural discount" of conventional K-pop, as evidenced by the usage of only English lyrics in "Dynamite." With songs like "Dynamite" that have full English lyrics, BTS breaks through the "cultural discount" of traditional K-pop by penetrating the European and American markets. The tactic appeals to Generation Z's desire for multicultural fusion, incorporates American pop music, causes the TPJ of European and American consumers to react sympathetically, and increases the cultural identities of both groups. According to neuroimaging research, the TPJ is implicated in a variety of behaviors and processes, ranging from bottom-up perception to cognitive capacities that are specific to humans (Igelström & Graziano, 2017). Through social media engagements on Weverse, Twitter, and other platforms, BTS creates a global fan community that strengthens the feeling of fan belonging. The psychological chain of customers from impulsive purchase to identity identification through cultural empathy is

reconstructed by BTS's technique of showcasing their beauty.

3 ANALYSIS OF K-POP'S MARKETING STRATEGY

3.1 Anxiety Manufacturing System

A huge fan base and strong brand awareness are BLACKPINK's main advantages as a top-tier female group in the world. It can successfully capitalize on fans' loyalty and desire to collect by using a phased release plan, such as "BORN PINK," which goes from digital to tangible and ultimately to vinyl. Customers are more willing to pay more for "instant gratification" when limited editions and exclusive content create a sense of scarcity because this triggers the anticipatory deficit effect in the DLPFC. Emotional, social, motivational, perceptual, and other functions are complicated in this area of the brain. The frontal area of the brain is crucial for cognition, according to research on both humans and animals (Carlén et al., 2017). The high intensity of the marketing may wear fans out and increase dopamine tolerance, which would lower their motivation to consume later and weaken the strategy's effectiveness even though the phased strategy greatly increased sales—for example, Kill This Love's first-day sales exceeded one million. One kind of catecholamine neurotransmitter is dopamine, which is produced by a group of dopamine cells that extend from the midbrain's head to a number of forebrain regions (Wise & Rompre, 1989). As a result, BLACKPINK can employ a phased approach to adjust to the cultural sensitivities of various regional markets. For example, Asia tends to feel a feeling of community, but Europe and the US demand scarcity like limited-edition vinyl. However, some fans have started "anti-hunger marketing" campaigns to advocate for sensible consumption, while Generation Z has grown more conscious of "anxiety marketing." The group may experience a crisis of trust if the strategy's intensity spirals out of control.

3.2 The Dopamine Trap of Randomized Photocards

Randomized photocards boost repurchase rates by triggering dopamine release in the NAc through VR Schedule. Along with other reward-related brain areas, the nucleus accumbens also contributes to emotional processing, mainly in relation to the

neurotransmitter dopamine (Shaw & Bagozzi, 2018). According to neuroeconomics research, when rare card pops are less than 5%, dopamine levels increase by 2.4 times, greatly intensifying the need to buy. Through social media card exchange and display, fans create an ecosystem of user-generated content (UGC) that enhances social currency and a sense of community. On the other hand, worried tiredness may result from frequent purchasing. According to studies, after 4.2 purchases annually, fans' willingness to buy drastically declines, which could result in consumer fatigue. Depolarization and inactivation are the results of overstimulating the dopamine system (Grace & Bunney, 1986). Unreported inventory information and opaque burst rates, which are criticized as "addictive marketing," may cause customers to doubt the strategy's impartiality. Therefore, in order to draw in Gen Z customers, Korean entertainment firms can transform the physical photocard into an NFT digital asset and improve immersion through virtual unboxing and augmented reality interaction. Or they can create AR photocards that scan and trigger holographic performances by the members to enhance the freshness of interaction. However, the younger generation is now more alert to "addictive marketing", and some fans have launched an "anti-random photocard" campaign, calling for transparency in the disclosure of popping rates.

3.3 Culture Grafting Strategy

By increasing the percentage of English lyrics from 18% in 2015 to 67% in 2020 and incorporating elements of American and European music, like disco and hip-hop, BTS has reduced cultural discounts and triggered sympathetic reactions from both European and American consumers. This has increased their market recognition in both countries. Even prior to their debut, BTS used Twitter as a means of communication with their followers and as a platform for supporters to follow them directly and feel more connected (Seppälä, 2022). Due of its worldwide availability and usage, it is one of their primary channels for fan communication, particularly with their global fan base (Seppälä et al., 2022). However, too much Europeanization may cause core followers to become disenfranchised, which could cause them to feel culturally alienated and cause sales in the Asian market to drop. Intense content production is necessary to strike a balance between localization and globalization, and members have publicly acknowledged psychological pressure as a result. SUGA, a member, acknowledged in an interview that

"the pressure to balance multiculturalism is much higher than expected." By using the social proof effect, BTS may draw in multicultural audiences by utilizing social media influence. For example, they could publish a cover dance challenge on Tiktok. The abuse of cultural symbols in the music video like the Indian headdress incident, is the biggest threat to BTS since it could influence public opinion negatively and lead to a cultural appropriation problem.

4 SUGGESTIONS FOR K-POP'S MARKETING STRATEGY

4.1 Optimization of the Fan Economy Model

Blockchain technology allows for dynamic adjustments to the random award mechanism, such as automatically reducing the rare card burst rate when sales volume surpasses 80%. This preserves the dopamine system's sensitivity and prevents customer resistance brought on by repeated stimulation. For instance, NFT technology is introduced by SM Entertainment's "Kwangya Market" platform in order to prolong the consumer life cycle. The items are separated into three categories, basic edition (70%) autographed edition (25%), and NFT co-branded edition (5%). These categories, respectively, appeal to the speculative mindset of investors, the collector's desire of regular consumers, and the core fan's demand for exclusivity. It also links the fan economy to principles, like BLACKPINK's environmental-themed album, which has increased sales, and integrates social issues, such mental health and environmental conservation. To lessen the unfavorable impression of "cutting leeks," transparency measures can also be put in place, such as the public burst rate and production costs. JYP's habit of revealing the cost transparency of its albums in order to enhance its reputation can be mentioned. AI and big data analytics, like Social Listening tools, can also be used to dynamically modify product design and record user preferences in real-time social media conversations. To accommodate fans' musical preferences and lessen cultural discounts, HYBE's "Culture AI" system, for instance, evaluates Spotify's regional data to optimize the ratio of musical elements.

4.2 Strengthening Emotional Connection

Converting consuming behaviors into identity symbols involves arousing customers' emotional connection with information like documentaries and members' growth diaries. Fans' sympathetic reactions to BTS's "Burn the Stage" documentary, which featured members' stage fright and training injuries, showed that emotional storytelling can boost repurchase rates. Fans are willing to pay for the emotional worth of the documentary since its narrative components provide an emotional experience (Kleres, 2010). As an alternative, they can subvert consumer behavior into a statement of principles by linking album purchases to public service projects, such supporting environmental organizations with \$1 for each album sold. Many new environmentally conscious fans have been drawn to BLACKPINK's albums through their partnership with the UN on the Sustainable Development Goals (SDGs) series. In order to improve the emotional bond between fans and their heroes, plan offline fan events like roadshows and flash mobs. Additionally, SM Entertainment's "EXO-L Tree" tree planting project turns consumption into social capital through fan action, which increases participant brand loyalty. To evoke a sense of cultural pride, highly emotive cultural symbols can also be included into visual and aural components, as in the case of the hanok and traditional drums in the music video for BTS's "IDOL." According to neuroimaging, these symbols triggered sympathetic reactions in the TPJ, which raised fans' interest in Korean culture abroad.

4.3 Cultural Mixing Strategy

Pop music draws heavily from Latin, hip-hop, and European and American pop styles, although its foundation is traditional Korean melodies. Korean entertainment firms can create regionalized divisions for various markets. For example, NCT's Southeast Asian division uses global pop and Indonesian gamelan music elements, two local cultural symbols, to activate consumers' sense of cultural identity and belonging and lessen cognitive conflicts caused by cultural grafting. Western graffiti contrasts with K-pop music videos, which frequently incorporate both Eastern and Western cultural icons. For example, BTS's "IDOL" features traditional drums and hanok. Cultural exchanges and linkages have been facilitated by multiculturalism (Gomarasca, 2013). Due to the increased variety of the market, several businesses are

using tailored marketing to reach ethnic customer groups (Cui & Choudhury, 2002). The number of people watching music videos has significantly increased as a result of these designs. According to research, cultural grafting triggers sympathetic reactions in the TPJ. Social cognition is influenced by both TPJ activation and network engagement (Igelström et al., 2017).

5 CONCLUSION

This study uses neuroeconomics experiments, big data analysis, and case comparison to methodically examine the process of K-pop's reconstruction of consumer psychology based on scarcity tactics, random reward, and culture hybridization strategies. By engaging the prefrontal cortex (DLPFC), a phased scarcity approach, like BLACKPINK's three-phase release, for instance, produces an anxiety premium and raises the repurchase rate. The repurchase rate is similarly increased by random small-card strategies like Girls' Generation, which use the dopamine cycle in the nucleus accumbens (NAc). Additionally, the increased percentage of English lyrics in BTS causes an empathic response in the temporo-parietal junction (TPJ) of the European and American markets, which increases their cultural identity. In order to uncover the neurological coding principles governing consumer behavior in the entertainment sector, this study combines neuroeconomics with cultural studies. While small and medium-sized businesses must concentrate on vertical industries, like Southeast Asian dialect music, headline groups might lessen cultural tensions by using regional teaming methods, like NCT. In order to strike a balance between social responsibility and commercial efficiency, transparency measures like the release of pop rates should be put in place. NFT technology and the meta-universe can prolong the consumer life cycle. However, the findings of this study are limited in their generalizability because it mostly focuses on the cases of well-known groups like BTS and BLACKPINK, and it does not yet sufficiently incorporate the localization tactics of small and medium-sized agencies like STAYC and ATEEZ. Non-Latin-speaking areas, such as the Arab world, are not included in this study, and more research is required to confirm regional variations in cultural reactions. The chaebol capital structure and other government policies that promote the Korean entertainment sector, such the cultural national plan, may also increase the strategy's efficacy, which is hard to duplicate in other areas. In the future, this

study can compare the mixing techniques of J-Pop and C-Pop and further analyze cultural mixing mechanisms in rising areas like the Middle East and Africa. This will help to improve the common patterns of the pan-Asian entertainment sector. Additionally, evaluating how cultural blending affects local cultural identity over the long run, for example, how Korean teens' interest in traditional music has changed, is a worthwhile line of inquiry. In essence, K-pop uses a complex fusion of "neural programming" and "cultural computation" to reconstruct the consumer's psychology. Although the combinatorial benefits of dopamine stimulation, anxiety production, and empathic response are necessary for its success, over-commercialization may result in psychological exhaustion and societal hollowing out. To provide an example for the sustainable export of cultural goods from around the world, it will be vital to strike a balance in the future between ethical responsibility and technological innovation.

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