VISUAL REVIEW | Vol. 18, No. 4, 2026 | ISSN 2695-9631
International Visual Culture Review / Revista Internacional de Cultura Visual
https://doi.org/10.62161/revvisual.v18.6281

LYRICAL AND INSTRUMENTAL MUSIC ON TIKTOK: Attention, Emotion and Social Virality

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KEYWORDS
Neuromarketing
Electrodermal activity (EDA)
Audiovisual attention
Implicit emotional engagement
Music typology
Social virality
TikTok

ABSTRACT
The study analyses the differential impact of lyrical and instrumental music on cognitive–emotional processing and the social dissemination of content on TikTok. Using a multimethod experimental design, the research integrates measures of electrodermal activity (EDA), automated facial expression analysis, declarative responses, and real platform interaction metrics. The results indicate that instrumental music promotes more sustained physiological attention, whereas lyrical music enhances conscious evaluation and behavioural engagement. Furthermore, partial dissociations are observed between implicit emotional activation and behavioural virality.

Received: 07/ 03 / 2026
Accepted: 14/ 04 /2026

1. Introduction

Short-form video platforms have become established as highly competitive attentional environments in which audiovisual stimuli must capture, sustain, and convert attention into measurable interaction within minimal time intervals. TikTok, with over one billion monthly active users, exemplifies this ecosystem of accelerated, highly visual consumption structured around the systematic integration of musical stimuli.

In this context, music does not merely function as an aesthetic accompaniment but as a resource that shapes how audiences interpret content (Martínez Allué & Martín-Cárdaba, 2024; Yang, 2025; Xiao, 2026). Virality therefore depends not only on emotional activation but also on the interaction between creators, algorithms, and audiences within the platform's architecture (Arrieta, 2025).

Recent literature in neuromarketing has demonstrated that music influences attentional and affective systems, shaping memory, content evaluation, and behavioural decision-making (Alvino et al., 2024; Bigné et al., 2025). However, much of this evidence has relied on declarative methodologies, which are limited in capturing the physiological dynamics of cognitive–emotional processing in high-speed digital environments (van Diepen et al., 2025).

A central line of research concerns the distinction between lyrical and instrumental music as stimuli with differing cognitive loads. The presence of verbal content may increase processing demands and compete for available attentional resources in complex audiovisual contexts (Wang et al., 2024), thereby fostering attentional fragmentation (Ye et al., 2024). By contrast, instrumental music tends to function as a non-verbal emotional modulator, facilitating more stable perceptual integration (Eerola et al., 2024).

On platforms such as TikTok, this distinction acquires strategic relevance, as virality depends on the conversion of internal responses into observable actions—such as sharing, saving, or reusing content—within social and algorithmic dynamics (Arrieta, 2025). Furthermore, recent research shows that intense emotional activation does not always correspond to users' self-reported emotions (Berger, 2025; Rodríguez-Rabadán et al., 2025).

Despite the growing body of research on music and audiovisual engagement, a methodological gap persists in the integration of neurophysiological metrics, declarative responses, and real social media performance data within a single analytical framework. In particular, there is limited empirical evidence examining simultaneously how music typology modulates non-conscious physiological attention, emotional response, and behavioural virality in ultra-short consumption environments.

In this context, the present study addresses four research questions:

(RQ1) How does lyrical versus instrumental music influence physiological attention during exposure to short-form video content?

(RQ2) What differences does each music typology generate in implicit emotional activation?

(RQ3) How are these differences reflected in the conscious evaluation of content, such as liking, recall, or sharing intention?

(RQ4) To what extent are psychophysiological indicators of attention and emotion related to real interaction and virality metrics on TikTok?

To address these questions, a multimethod design is adopted, integrating group electrodermal activity measurement using Sociograph© (Sociograph Neuromarketing Science), automated facial expression analysis, post-exposure questionnaires, and real interaction metrics from TikTok. This approach is aligned with marketing science methodologies focused on the integration of data, analysis, and application in real communication contexts (Martín-Guerra et al., 2024; Mielgo Álvarez & Saá Teja, 2025).

2. Theoretical Framework and State of the Art

The role of music in audiovisual processing can be understood through dual-processing models, which distinguish between conscious mechanisms accessible through self-report and automatic physiological processes of a non-deliberative nature (Bigné et al., 2025; Scholz et al., 2025).

In ultra-fast consumption platforms such as TikTok, where user behaviour occurs under conditions of low reflection and high sensory load—consistent with approaches to complex technological environments—implicit metrics are particularly relevant for analysing the audiovisual experience (Luna & Gómez, 2025; van Diepen et al., 2025).

From a multisensory perspective, music acts as a key modulator of audiovisual processing, influencing attention, memory, and content evaluation (Bruner, 1990; Kellaris et al., 1993; Krishna, 2012; North & Hargreaves, 2006; Oakes, 2007). In the field of advertising, its capacity to structure narrative and guide message interpretation has been widely demonstrated, consolidating its role as a strategic component of so-called sonic branding (Allan, 2008; Jackson, 2003).

A central issue within this body of literature concerns the distinction between lyrical and instrumental music. The presence of verbal content may increase demands on working memory in complex audiovisual contexts, generating competition between sensory channels and fostering attentional interference (Wang et al., 2024; Ye et al., 2024). By contrast, instrumental music tends to facilitate a more fluid perceptual integration of audiovisual stimuli by reducing the cognitive interference associated with linguistic processing (Eerola et al., 2024).

However, empirical evidence on this phenomenon remains inconclusive. While some studies suggest that lyrical music may enhance content memorability by reinforcing semantic encoding, others indicate that it may produce cognitive overload when competing with complex visual information. This tension reflects an ongoing debate regarding the role of music as either an emotional facilitator or a potential cognitive distractor in multimedia contexts.

In digital environments such as TikTok, characterised by accelerated consumption and intense attentional competition, the interaction between visual and auditory stimuli becomes a key determinant of user engagement (Xiao et al., 2026). Moreover, music plays a structural role as a vector of cultural recognition, imitation, and content circulation within the algorithmic ecosystem (Arrieta, 2025; Yang et al., 2025).

At the same time, digital engagement is conceptualised as a multidimensional construct integrating affective, cognitive, and behavioural components (Peters et al., 2013; Rodríguez-Ulcuango et al., 2025). From a neuromarketing perspective, its measurement has been expanded through the use of psychophysiological indicators—such as electrodermal activity—and automated facial analysis technologies capable of capturing implicit emotional responses that do not always emerge in declarative self-reports (Bigné et al., 2025).

Virality, in turn, may be understood as the behavioural externalisation of the cognitive–emotional impact of content, although its diffusion also depends on social and algorithmic factors (Berger, 2025; Yan & Hu, 2026).

From an integrative perspective, the relationship between music and digital behaviour can be conceptualised as a multilevel process. First, music typology operates as a sensory stimulus that modulates the cognitive load and emotional activation of audiovisual content (Krishna, 2012). Second, this stimulus influences users' internal processing, reflected in variations in physiological attention and implicit emotional activation (Bigné et al., 2025). Finally, these internal processes may translate into observable behavioural responses on the platform, such as visible interactions or actions of social dissemination (Berger, 2025; Yan & Hu, 2026).

Based on these premises, the study adopts a conceptual model structured around three analytical levels: stimulus (music typology), internal processing (physiological attention and emotional activation), and behavioural response (behavioural engagement and virality indicators). This approach responds to the methodological need to triangulate physiological, emotional, and behavioural metrics in order to understand the impact of music in contemporary digital communication environments (Bigné et al., 2025; van Diepen et al., 2025).

3. Methodology

3.1. Study Design

A mixed experimental design with repeated measures was employed, aimed at the triangulation of neurophysiological data, declarative emotional responses, and real behavioural metrics from the platform. This approach is consistent with recent methodological recommendations in neuromarketing research, which emphasise the need to integrate physiological and behavioural indicators in order to enhance explanatory validity (Bigné et al., 2025; van Diepen et al., 2025).

The sample was exposed to a standardised sequence of TikTok videos categorised according to two analytical dimensions: music typology (lyrical vs. instrumental) and content type (informational, emotional, humorous, aesthetic, and choreographic).

Each stimulus was presented under controlled viewing conditions, ensuring the comparability of the recorded physiological signals. This design enabled the simultaneous capture of the temporal evolution of attention and emotional activation, as well as subsequent conscious evaluations and the actual behavioural performance of the audiovisual content.

The design combined experimental control with real stimuli in order to balance internal and ecological validity. The standardisation of exposure made it possible to isolate the effect of music typology, while the use of real videos and participants familiar with the platform approximated the experimental conditions to real digital consumption. This balance is in line with recent recommendations in neurophysiological research applied to marketing (Bigné et al., 2025; van Diepen et al., 2025).

3.2. Sample

The sample consisted of twenty participants (N = 20), selected through non-probability convenience sampling. This procedure is common in psychophysiological experimental studies, where the primary objective is to analyse relationships between stimuli and neurocognitive responses under controlled conditions, rather than to estimate parameters representative of a broader population.

In this type of research, sample size is justified by the intensive nature of biosignal collection and processing, as well as by the use of within-subject designs with repeated measures, which increase analytical sensitivity by generating multiple observations per participant (Bigné et al., 2025). Furthermore, the inferential stability of neurophysiological indicators depends largely on the consistency of recorded responses and the magnitude of the observed effect, rather than exclusively on aggregate sample size (van Diepen et al., 2025). In this regard, recent studies identify sample sizes of between 20 and 30 participants as appropriate for experimental designs involving psychophysiological measurements in digital environments (Rodríguez-Rabadán et al., 2025).

However, the relatively small sample size and the use of non-probability sampling limit the generalisability of the findings, which should be interpreted as experimental evidence on the cognitive–emotional mechanisms underlying audiovisual processing, rather than as representative estimates of the overall user population of TikTok.

Participants ranged in age from 18 to 58 years, with a predominance of women (65%) and a minimum educational level equivalent to upper secondary education. In addition, the majority identified as regular users of TikTok (65%), which contributes to strengthening the ecological validity of the experiment by approximating exposure conditions to the platform's real patterns of audiovisual consumption.

3.3. Instruments and Variables

Physiological attention (EDL) was measured using Sociograph© technology, which continuously records group electrodermal activity (EDA) based on skin conductance expressed in kilo-ohms (kΩ). EDA constitutes a widely validated psychophysiological index for the study of emotional and attentional processes, as it reflects variations in the autonomic nervous system and levels of cortical activation (Boucsein, 2012; Dawson et al., 2007; Hossain et al., 2024).

The tonic component of the signal was measured through the electrodermal level (EDL), an indicator of sustained physiological activation and attentional resource allocation (Boucsein, 2012; Dawson et al., 2007). It was calculated using the mean rate of change (see Figure 1).

Figure 1. Mean EDL change rate (level of attention)

$$Mean\ rate\ of\ change\ EDL = -100 * \frac{EDL_{final} - EDL_{inicial}}{EDL_{inicial} * duración}$$

Source: Sociograph, based on standard electrodermal activity methods (Boucsein, 2012; Benedek & Kaernbach, 2010; Dawson et al., 2007; Gamboa et al., 2025; Hossain et al., 2024).

Electrodermal level (EDL) is interpreted as an indicator of sustained physiological attention and continuous allocation of cognitive resources during exposure to audiovisual stimuli. Positive values indicate an increase in sustained attention, whereas negative values reflect attentional decline.

Implicit emotional activation was estimated through the Electrodermal Response (EDR), corresponding to the phasic component of the signal (see Figure 2). This indicator was defined as the temporal mean of the electrodermal response during exposure.

Figure 2. Mean EDR rate of change (level of implicit emotional activation)

$$Media\ EDR\ = \frac{\sum_{inicial}^{final} EDR_t}{duración}$$

Source: Sociograph methodology, based on standard electrodermal activity procedures (Boucsein, 2012; Benedek & Kaernbach, 2010; Dawson et al., 2007; Hossain et al., 2024).

The analysis is grounded in the classical distinction between tonic and phasic components to quantify implicit emotional activation (Benedek & Kaernbach, 2010; Boucsein, 2012).

Additionally, automated facial expression analysis was conducted using FaceReader 9 (Noldus Information Technology), based on the Facial Action Coding System (FACS) developed by Ekman and Friesen (1978), which enables the classification of basic emotions according to Ekman's discrete model (2007).

Declarative responses were collected through a post-exposure questionnaire using ordinal scales measuring liking, recall, perceived attention, and sharing intention.

Real behavioural metrics were obtained from TikTok: views (V), likes (L), comments (C), saves (G), and shares (S). From these, the following indicators were calculated:

- Total Interactions (TI) = L + C + S
- *Engagement Rate* (ER) = (TI / V) × 100
- Viral Index (VI) = ((G + S) / V) × 100

The ER was interpreted as an indicator of overall engagement (Peters et al., 2013), while the VI was conceptualised as a proxy for intentional social dissemination, in line with models of interpersonal transmission of digital content (Berger, 2025).

In the present study, the concept of digital engagement is understood as a multidimensional construct comprising two analytical levels. First, implicit emotional engagement, estimated through the electrodermal response (EDR), which reflects non-conscious emotional activation generated during exposure to audiovisual stimuli. Second, behavioural engagement, estimated through the Engagement Rate (ER) derived from real platform interaction metrics (likes, comments, saves, and shares). This distinction enables a differentiated analysis of internal affective processes generated during content exposure and their subsequent externalisation in observable behaviours within the digital ecosystem.

Finally, the Virality Index (VI) is interpreted as a behavioural proxy for intentional social dissemination, as it reflects active user behaviours related to content propagation and storage.

3.4. Experimental Procedure

The experimental procedure was designed to ensure stimulus standardisation, control of contextual biases, and systematic triangulation between physiological measures, declarative responses, and real behavioural metrics from the platform.

A set of TikTok videos was selected to represent different content typologies, balancing the presence of lyrical and instrumental music. The categorisation was based on criteria of semantic and functional diversity. Emotional, viral, product-related, culinary, and choreographic content were included in order to maximise variability in cognitive and emotional responses.

The selected stimuli were integrated into a continuous 14-minute sequence structured into two phases: an initial 7-minute control phase aimed at familiarising participants with the experimental environment and stabilising the baseline physiological signal, and a 7-minute analytical phase composed exclusively of the stimuli under study. The distribution of videos according to content typology and musical condition is presented in Table 1.

Table 1. Presentation of analysed pieces by music and video type

Duration	Track number	Title of piece	Music with lyrics or instrumental
6:45–7:42	Track 1	Holocaust hero	Instrumental music
7:43–9:02	Track 2	Father Reunites His Children for Christmas	Music with lyrics
9:03–9:46	Track 3	Piano video	Instrumental music
9:47–10:29	Track 4	*Influencer* (Victoria Justice) getting out of a car	Music with lyrics
10:30–10:57	Track 5	Shoe rack from Aliexpress	Instrumental music
10:58–11:37	Track 6	Amazon products	Music with lyrics
11:38–12:21	Track 7	*Croissant* recipe	Instrumental music
12:22–13:06	Track 8	Lasagne recipe	Music with lyrics
13:07–13:31	Track 9	Classical dance	Instrumental music
13:32–14:03	Piece 10	Couples' dance (APT)	Music with lyrics

Source: Compiled by the authors based on data from the experiment, 2025.

Prior to the experimental session, public TikTok metrics were recorded for each audiovisual stimulus—views (V), likes (L), comments (C), saves (G), and shares (S)—which served as the basis for the subsequent calculation of the Engagement Rate and the Virality Index.

During exposure, conducted in a controlled environment, physiological responses were recorded simultaneously through group electrodermal activity using Sociograph©, employed to estimate sustained attention (EDL) and implicit emotional activation (EDR), as well as automated facial expression analysis using FaceReader 9, based on the Facial Action Coding System (FACS) developed by Ekman and Friesen (1978), which was used to classify the temporal distribution of basic emotions at the individual level (Ekman, 2007).

Following exposure to the stimuli, a structured digital questionnaire was administered to capture the conscious dimension of the user experience, including ordinal scales measuring perceived liking, attention, recall, musical preference, and intention to share content.

Finally, physiological, declarative, and behavioural data were integrated within a common analytical framework through comparisons between musical conditions and correlational analyses aimed at identifying patterns of convergence and divergence between non-conscious processing, conscious perception, and observable digital behaviour.

3.5. Control of External Variables

In order to reduce the influence of potentially confounding external variables, several experimental control mechanisms were implemented to ensure the comparability of the recorded physiological responses. First, exposure to the stimuli took place in a controlled laboratory environment, with constant conditions of ambient lighting, viewing distance from the screen, and sound playback level. These standardised conditions help minimise the interference of environmental factors in electrodermal activity (Boucsein, 2012).

Second, the sequence of videos presented was identical for all participants, ensuring the temporal comparability of the recorded physiological signals and avoiding potential effects derived from the order of exposure or variability in stimulus sequencing.

Additionally, the post-exposure questionnaire included items designed to identify individual variables that could potentially influence the processing of audiovisual content. These variables included frequency of TikTok use, general musical preference, and perceived familiarity with the viewed content. Recording these variables made it possible to contextualise the observed responses and control for potential biases associated with prior user experience with the platform or with specific musical styles.

Although these variables were not incorporated as independent factors in the analytical model, their consideration allowed for the verification of the overall homogeneity of the sample in terms of digital consumption habits and reduced the risk that the observed physiological responses were attributable to pre-existing differences in experience or prior exposure to the content. This procedure is consistent with methodological recommendations in psychophysiological research applied to marketing, which emphasise the need to control contextual variables and individual characteristics in order to enhance the internal validity of experimental designs (Bigné et al., 2025).

3.6. Data Analysis Strategy

The data analysis was structured across three complementary analytical levels in order to integrate information derived from neurophysiological measures, declarative responses, and platform behavioural metrics.

First, a descriptive analysis of the neurophysiological indicators derived from electrodermal activity was conducted. Specifically, the tonic (EDL) and phasic (EDR) components were analysed as indicators of sustained physiological attention and implicit emotional activation, respectively. Mean values and general signal trends were calculated for each experimental condition, enabling comparison of attention and emotional activation levels between stimuli featuring lyrical music and those with instrumental music.

Second, comparisons between experimental conditions were carried out through analyses of mean differences across stimulus categories and exploration of temporal patterns in electrodermal activity series. This analysis made it possible to identify variations in the intensity and stability of physiological responses throughout audiovisual exposure, as well as to detect specific moments of increased or decreased activation associated with particular narrative segments of the videos.

Third, correlational analyses were conducted between psychophysiological indicators (EDL and EDR), declarative responses obtained from the post-exposure questionnaire, and real behavioural metrics from TikTok, specifically the Engagement Rate (ER) and the Virality Index (VI). This analysis enabled the exploration of potential relationships between implicit processing of audiovisual stimuli, subsequent conscious evaluation, and observable behavioural responses on the platform.

The integration of these three analytical levels reflects the methodological triangulation approach adopted in the study, which seeks to examine convergence or divergence between physiological, perceptual, and behavioural indicators in order to achieve a more comprehensive understanding of the impact of musical stimuli in digital communication environments (Bigné et al., 2025; van Diepen et al., 2025). Table 2 presents the conceptual model articulating the relationships between the variables analysed. This structure allows for an integrated analysis of the relationship between neurophysiological processes generated during stimulus exposure and their potential translation into observable digital behaviours.

Table 2. Analytical model of the study

Analytical level	Variable	Indicators	Data source
Stimulus	Musical genre	Music with lyrics / Instrumental music	Video characteristics
Internal processing	Physiological response	Electrodermal level (EDL)	Sociograph (EDA)
	Implicit emotional arousal	Electrodermal response (EDR)	Sociograph (EDA)
	Emotional expression	Basic emotions (Ekman)	FaceReader
Mindful evaluation	Perception of content	Liking, recall, perceived attention, intention to share	Post-screening questionnaire
Behavioural response	Behavioural *engagement*	*Engagement Rate* (ER)	TikTok metrics
	Virality	Virality Index (VI)	TikTok metrics

Source: Compiled by the authors based on data from the experiment, 2025.

Given the exploratory nature of the study and the small sample size, the analyses were primarily oriented towards identifying relational patterns between variables rather than estimating complex inferential models.

4. Results

This section integrates neurophysiological indicators, emotional analysis based on Paul Ekman's (2007) basic emotions model, declarative responses, and real behavioural metrics from TikTok within a unified analytical framework. The aim is to model the relationship between the musical stimulus, users' internal processes—namely attention and emotional activation—and their externalisation in the form of social interaction and digital dissemination.

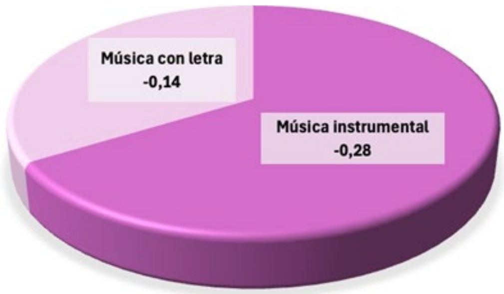
4.1. Electrodermal Activity (EDA)

Electrodermal activity, decomposed into its tonic (EDL) and phasic (EDR) components, was used as an indicator of sustained attention and implicit emotional activation. Two complementary analytical levels are identified: a global level by musical condition and content category, and a temporal level by individual stimulus, enabling the identification of drivers and inhibitors of cognitive–emotional processing.

A) Global analysis by musical condition and content type

At an aggregate level, videos featuring instrumental music generate higher levels of sustained physiological attention (EDL) than those with lyrical music (Figure 1). This finding suggests that the absence of verbal content reduces cognitive interference and facilitates a more stable allocation of attentional resources during exposure.

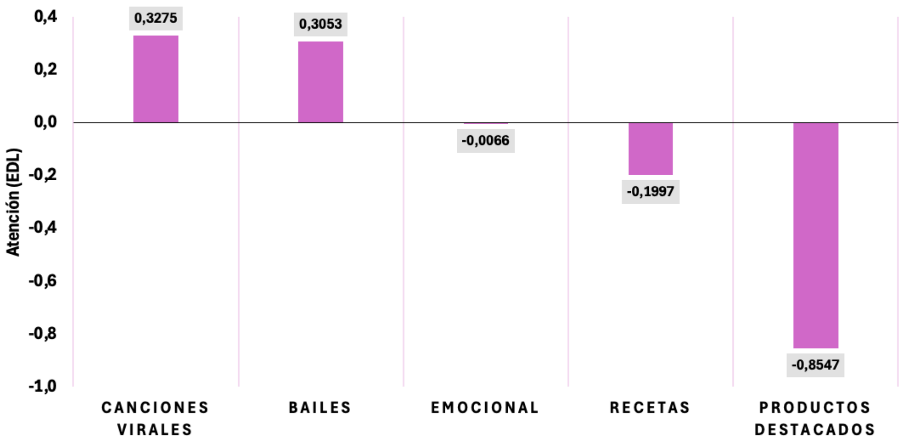
Figure 1. Overall level of physiological attention (EDL) by music type



Source: Author's own analysis based on experimental data, 2025.

When segmented by content category, the highest attentional responses are observed in choreographic content and viral songs, whereas recipe, product-related, and emotional content exhibit more moderate levels of attention (Figure 2). This pattern suggests that formats characterised by greater visual dynamism and audiovisual synchrony more effectively capture users' physiological attention.

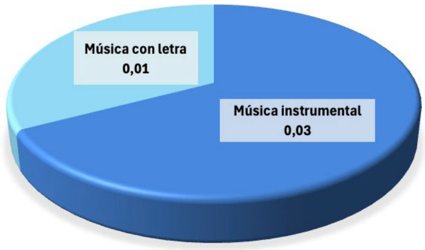
Figure 2. Level of physiological attention (EDL) by TikTok category



Source: Author's own analysis based on experimental data, 2025.

In terms of implicit emotional activation (EDR), instrumental music also shows slightly higher and more consistent values (Figure 3), with peak levels observed in choreographic content.

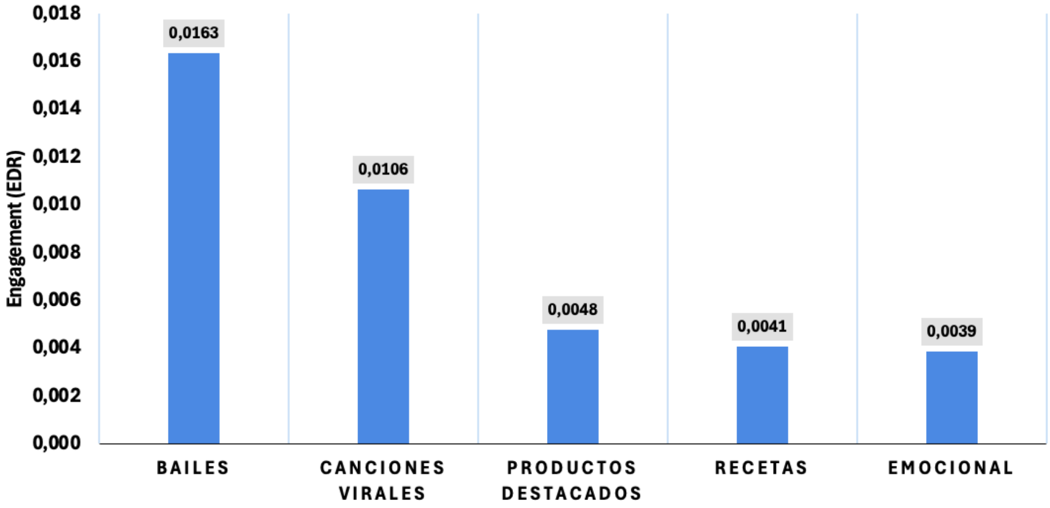
Figure 3. Overall level of implicit emotional activation (EDR), by music with lyrics or instrumental



Source: Author's own analysis based on experimental data, 2025.

When the analysis is disaggregated by content typology, all categories generate detectable levels of emotional activation, although choreographic content exhibits the highest levels of implicit emotional activation (Figure 4). This finding reinforces the relevance of formats based on musical trends and audiovisual synchrony in eliciting intense affective responses on short-form video platforms.

Figure 4. Level of implicit emotional arousal (EDR) by TikTok category



Source: Author's own work based on experimental data, 2025.

The correspondence between EDL and EDR is linked to the logic of musical trends, in which visual dynamism, auditory recognition, and social imitation amplify both attentional and emotional processing. This pattern suggests that the absence of verbal load facilitates multisensory integration and electrodermal stability.

Table 3 provides a comparative summary of the relative levels of attention (EDL) and emotional activation (EDR) across the different content categories. Overall, content associated with viral musical dynamics—particularly recognisable songs and choreographic videos—concentrates the highest combined levels of attention and emotional activation. By contrast, functional or informational content, such as product-related or recipe-based videos, generates more moderate psychophysiological responses, suggesting a more cognitive rather than affective processing of audiovisual stimuli.

Table 3. Comparative relative levels of attention and emotional activation (EDL/EDR) by content category (cross-category ranking)

Content category	EDL (inter-category)	EDR (inter-category)	Functional interpretation	Relationship between instrumental music and music with lyrics
Viral songs	High (maximum)	High	Musical familiarity + high variation stimulate	≈ Equivalent
Dances	High	High (maximum)	Visual synchrony + imitative logic of *the trend*	≈ Equivalent
Emotional	Medium	Medium-high	Narrative weight; sensitivity to semantic shifts	Instrumental>Lyrics
Featured products	Mid-low	Medium	Functional/cognitive processing; lower affective load	Instrumental>Lyrics
Recipes	Lower-middle	Medium	Localised activation in “before/after” (final result)	Instrumental>Lyrics

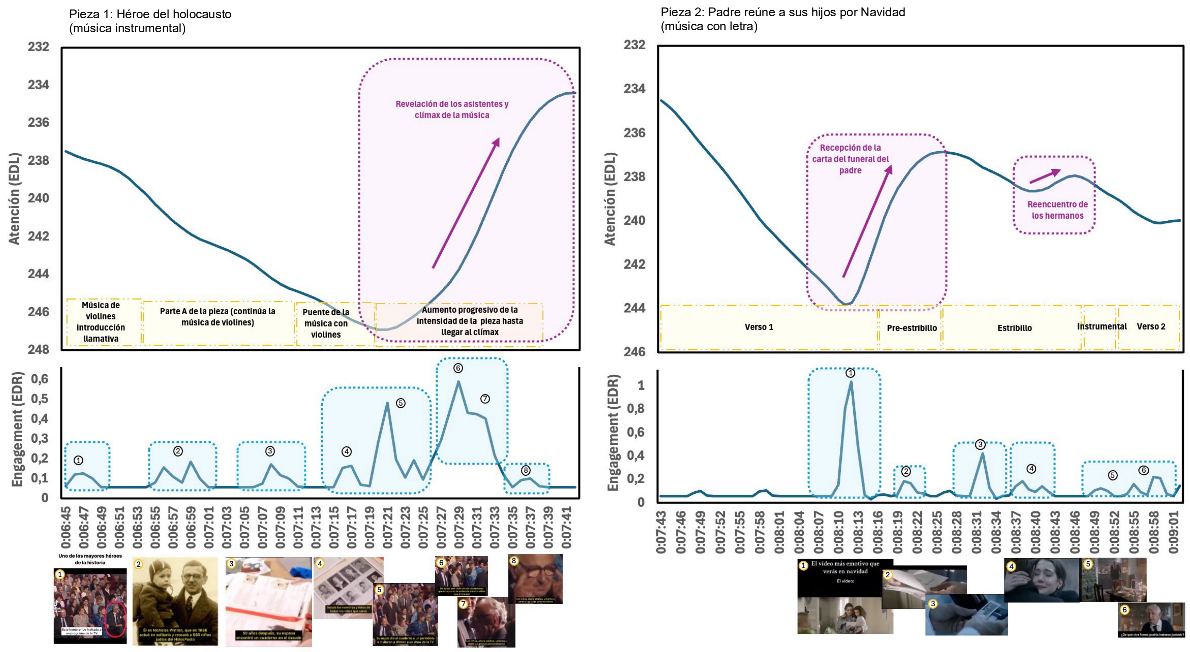
Source: Compiled by the author based on experimental data, 2025.

B) Temporal analysis per piece (EDA): drivers and inhibitors

The temporal analysis made it possible to identify narrative climaxes, salient visual changes, and moments of audiovisual synchrony as the main drivers, while inhibitors are associated with repetitive structures or low stimulus variability.

Evidence by content typology confirms the consistency of these patterns. In emotional content (stimuli 1 and 2), EDR peaks align with narrative turning points, with more stable attention under instrumental music and more concentrated activation under lyrical music. Figure 3 shows that peaks in emotional activation are concentrated at moments of greatest affective intensity, particularly at key narrative shifts. While instrumental music maintains more stable levels of attention, lyrical music generates more localised emotional peaks.

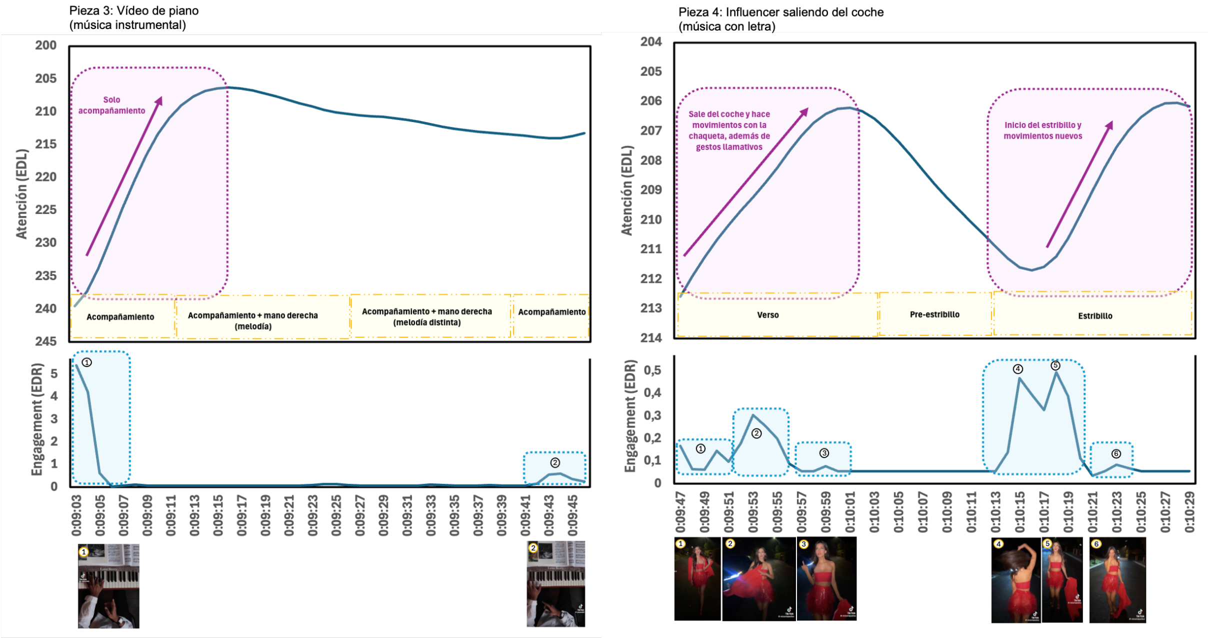
Figure 3. EDL and EDR levels in emotional videos, by musical condition



Source: Author’s own work based on experimental data, 2025.

In viral songs (stimuli 3 and 4), attention remains relatively stable across both musical conditions, although emotional activation shows notable differences: in instrumental videos, it is distributed more continuously, whereas in videos with lyrics it is concentrated around the choruses (Figure 4).

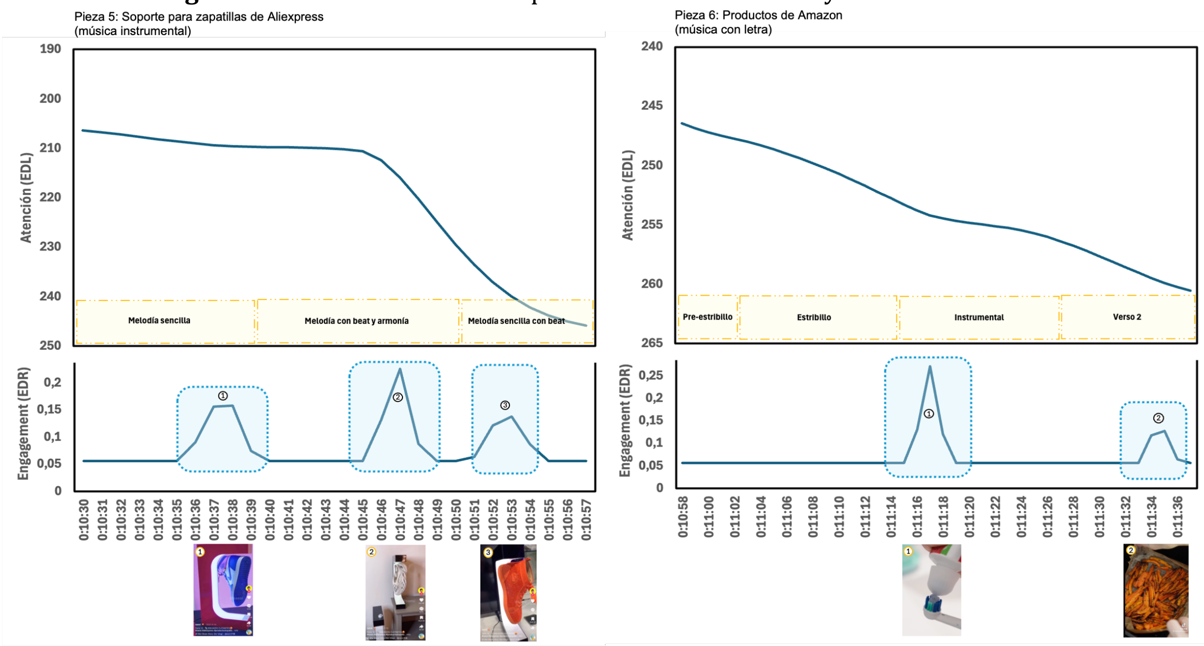
Figure 4. EDL and EDR levels in videos featuring viral songs, by musical condition



Source: Author's own work based on experimental data, 2025.

In product-focused content (stimuli 5 and 6), peaks in activation coincide with moments of functional demonstration. In this type of content, instrumental music is associated with more sustained attention, whereas lyrical music produces more fragmented patterns of activation (Figure 5).

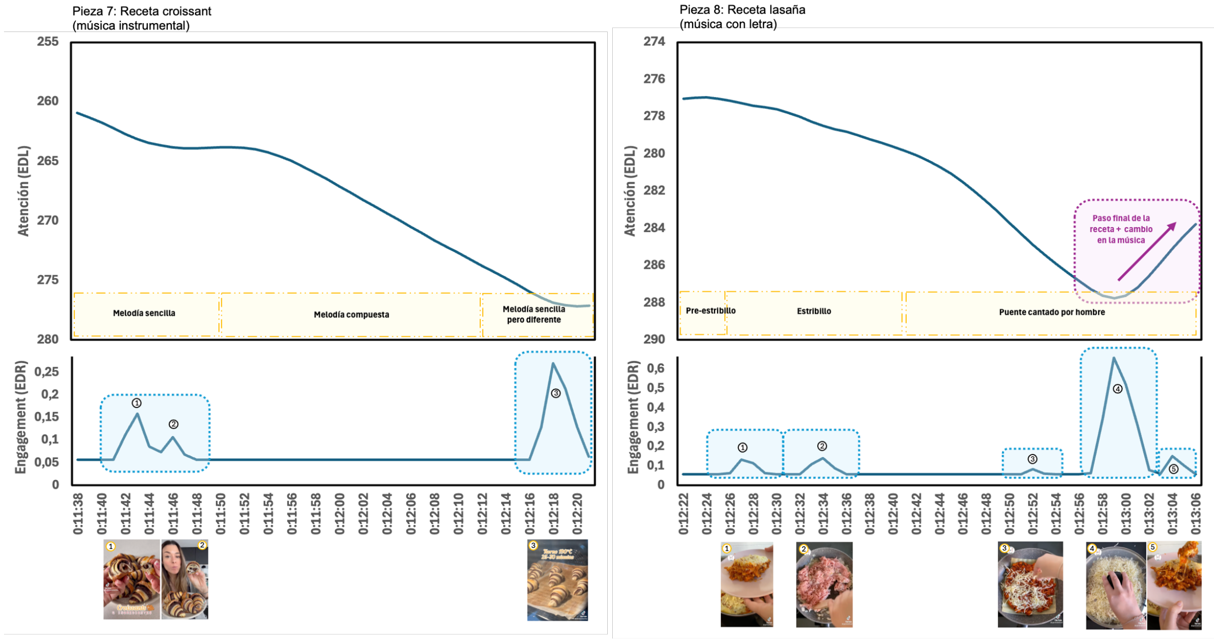
Figure 5. EDL and EDR levels in p roduct-focused videos by musical condition



Source: Author's own work based on experimental data, 2025.

In recipe-based content (stimuli 7 and 8), the main increase in activation occurs during the presentation of the final result. Although both musical conditions elicit emotional responses, instrumental music maintains a more stable attentional profile during the intermediate stages of the process (Figure 6).

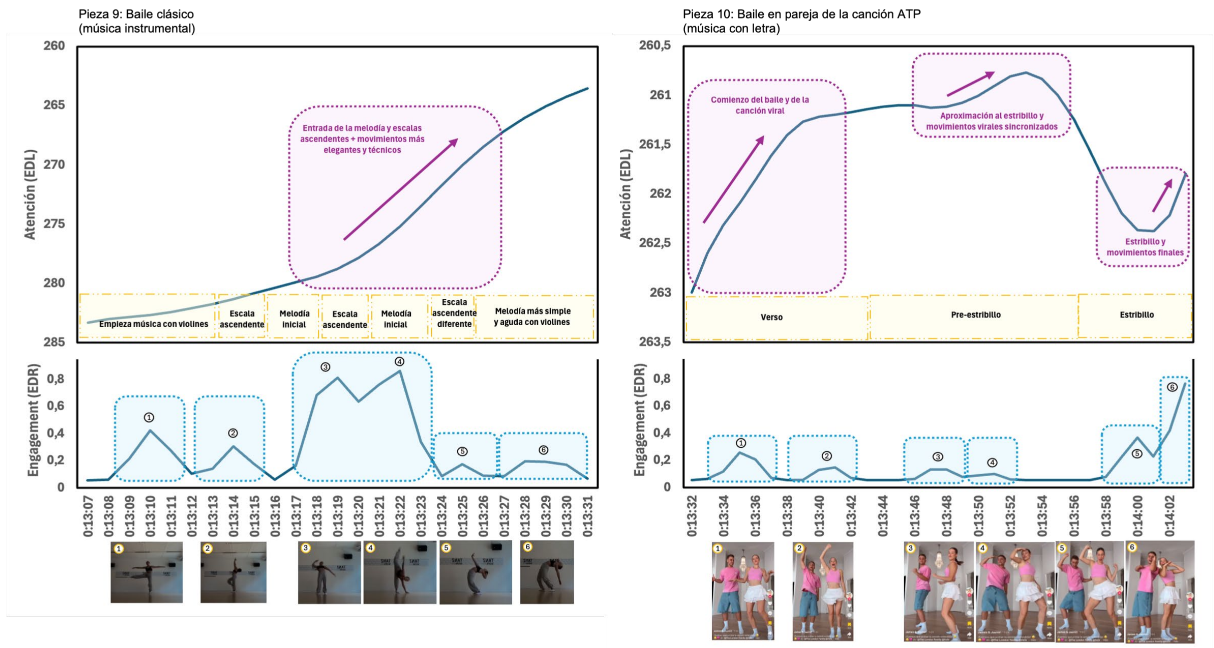
Figure 6. EDL and EDR levels in recipe videos according to musical condition



Source: Author’s own work based on experimental data, 2025.

Finally, in choreographic content (stimuli 9 and 10), emotional peaks coincide with moments of choreographic synchrony and rhythmic variation. Instrumental music produces more sustained activation, whereas lyrical music concentrates the emotional response around recognisable choruses (Figure 7).

Figure 7. EDL and EDR levels in videos of choreographic content (dances) according to musical condition



Source: Author’s own compilation based on experimental data, 2025.

The synthesis of drivers and inhibitors by category, together with the differences between instrumental and lyrical musical conditions for strategic interpretation, is presented in Table 4. The main drivers combine narrative, musical, and visual elements that introduce perceptual novelty or emotional intensity, whereas inhibitors are associated with flat narrative structures, visual repetition, or the absence of salient stimuli, all of which reduce the intensity of the recorded physiological response.

Table 4. *Drivers* and inhibitors by category based on the EDL/EDR temporal analysis and differences by musical condition

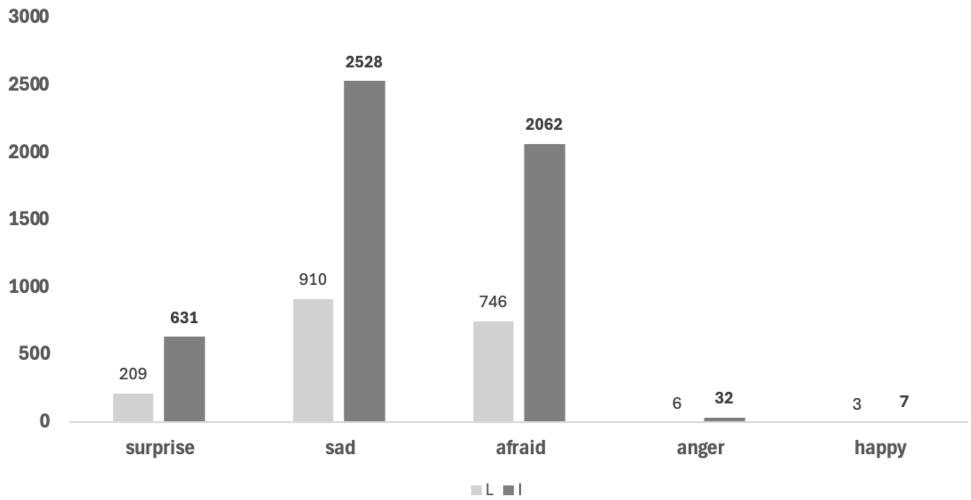
Content category	*Drivers* (common)	Inhibitors (common)	Difference between instrumental music and with lyrics
Emotional	Emotional music, emotional content, narrative surprises.	Slow start, lack of narrative dynamism, predictability.	Instrumental: more stable and progressive EDL Lyrics: EDR peaks concentrated in semantic nodes and choruses
Viral	Practical presentations, visual demonstrations, useful products.	Overload of products, low visual relevance, repetitiveness	Instrumental: brief, scattered EDR peaks Lyrics: EDR peaks concentrated in highly familiar choruses
Product	Musical recognition, viral music with lyrics, dynamic rhythm, strong initial stimulus.	Slow start in instrumental sections, loss of interest after the initial impact	Instrumental: more sustained attention during the demonstration; Lyrics: greater fragmentation and localised activation in "problem-solution" products
Recipes	Appetising visual content, attractive end results, dynamic processes.	Steady decline in attention, monotonous music, localised emotional activation	Instrumental: more stable EDL in intermediate phases Lyrics: additional EDR peaks in vocal reinforcements without sustained increase in attention
Dancing	Synchronised movements, viral music, dynamic visual stimuli.	Repetitive structure, drops in attention- s between sections, demand for sustained attention	Instrumental: longer EDR peaks and stable EDL Lyrics: emotional peaks concentrated in recognisable choruses

Source: Author's own analysis based on experimental data, 2025.

4.2. Emotional Profile and Drivers/Inhibitors (Ekman Model)

Facial coding analysis enabled the identification of the temporal distribution of basic emotions. At an aggregate level, sadness, fear, and surprise predominate, with occasional occurrences of happiness and anger (Figure 5). This pattern suggests an emotional activation primarily associated with processes of attention, alertness, and narrative empathy.

Figure 5. Comparison of the number of times emotions occurred in music videos with lyrics and instrumental music.



Source: Author's own work based on experimental data, 2025.

In order to link these observed emotional patterns with their strategic relevance in digital dissemination, an analytical matrix of emotional *drivers* and inhibitors was constructed, integrating predominant emotion (Ekman, 2007), expected neurophysiological dynamics (EDL/EDR) and their potential impact on interaction metrics on TikTok (ER, IV). Table 5 summarises this relationship between emotion, physiological processing and observable digital behaviour.

Table 5. Emotional drivers and inhibitors, neurophysiological hypothesis and relationship with TikTok metrics

Content category	**Main *drivers***	**Main inhibitors**	**Predominant Ekman emotion**	**Neurophysiological approach (EDL/EDR)**	**Expected involvement in ER/IV**
Emotional	Narrative surprise, emotional music, empathic connection	Sustained fear, predictability	Surprise, empathetic sadness	High arousal (EDR > P75); Medium-high EDL	Medium-high IV when EDR > P75; Moderate ER
Viral	Musical recognition, dynamic rhythm, strong initial stimulus	Emotional indifference, saturation	Joy, Surprise	Moderate activation (EDR P50–P75); EDL medium	High ER; high IV if visual novelty is maintained
Product	Visual demonstration, perceived utility, functional clarity	Distrust, neutrality	Surprise, neutrality	Moderate activation (EDR P50–P75); high EDL	Medium-high ER; Low-medium IV
Recipes	Attractive end result, visual dynamism	Boredom, monotonous music	Joy, Surprise	Moderate activation (EDR P50–P75); high EDL in final phases	Medium ER; Moderate IV
Dancing	Visual synchrony, viral music, motor energy	Repetition, visual fatigue	Joy, Surprise	High activation (EDR > P75); Medium EDL	High ER; Medium-high IV

Source: Compiled by the authors based on experimental data, 2025.
NOTE. The matrix incorporates three levels of interpretation:
(i) predominant emotion according to Ekman's model (2007);
(ii) expected neurophysiological dynamics in the tonic (EDL) and phasic (EDR) components;
(iii) behavioural implications in real platform metrics (*Engagement Rate* and Virality Index). Activation percentiles (P) were estimated based on the relative distribution of EDR recorded in the experimental sample.

In general terms, emotions associated with perceptual novelty and positive social orientation, such as surprise or happiness, are linked to higher levels of implicit emotional activation (EDR) and a greater likelihood of social dissemination of content. By contrast, low-arousal emotional states, such as neutrality or boredom, are associated with declines in physiological attention (EDL) and lower levels of interaction on TikTok.

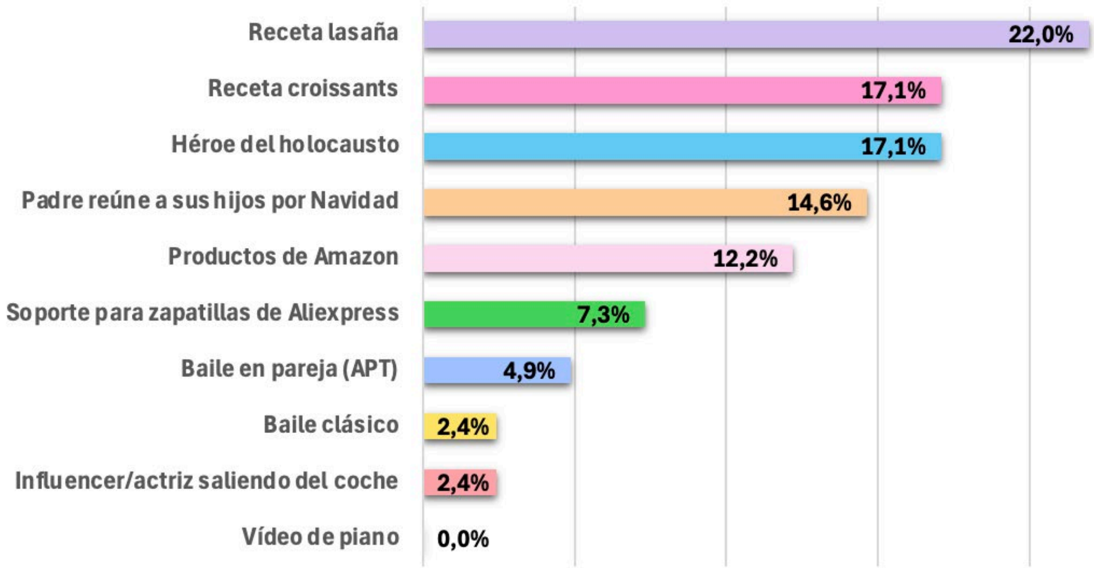
From an integrative perspective, these findings suggest that the main emotional drivers of digital content combine perceptual novelty, affective resonance, and empathic connection, whereas inhibitors are concentrated in states of low emotional stimulation or sustained defensive responses.

In this sense, music acts as a modulator of the emotional architecture of audiovisual stimuli, shaping the physiological dynamics of attention and activation (EDL/EDR), which subsequently influence the likelihood of behavioural externalisation in the form of interaction and social dissemination.

4.3. Declarative Response and Perceptual Discrepancy

Questionnaire responses indicate a conscious preference for videos featuring lyrical music, which are perceived as more attention-grabbing, memorable, and shareable (Figure 6). This finding reflects a higher self-reported intention to share this type of content.

Figure 6. Videos the sample would share on TikTok



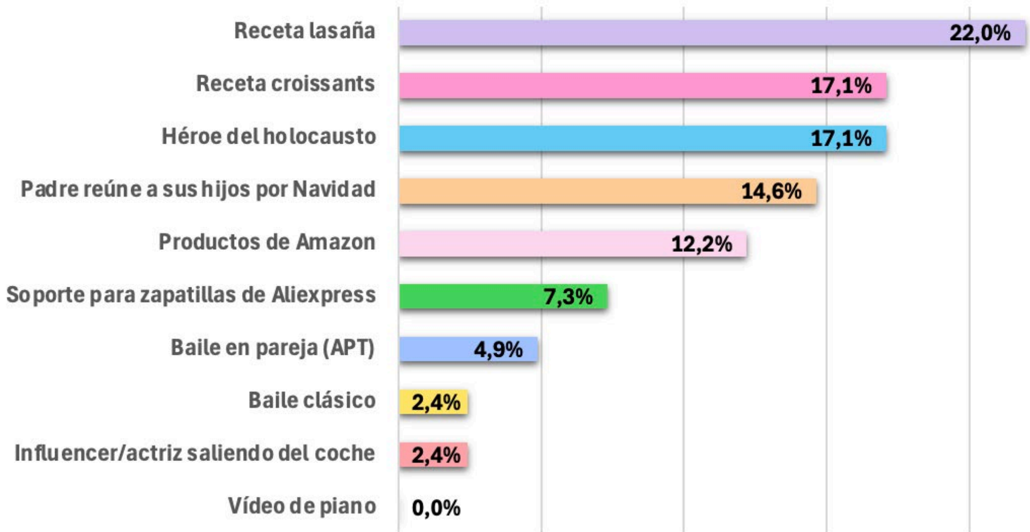
Source: Author's own work based on experimental data, 2025.

However, this preference does not correspond to the levels of implicit emotional activation recorded through EDR, revealing a gap between non-conscious processing and declarative evaluation. This finding reinforces the limitations of self-reports in capturing the actual emotional impact in high-speed consumption environments.

4.4. Real Metrics and Virality

Behavioural analysis constitutes the third level of validation of the model. Engagement Rate (ER) values show higher levels of visible interaction in videos featuring lyrical music (Figure 7), consistent with the declared preference.

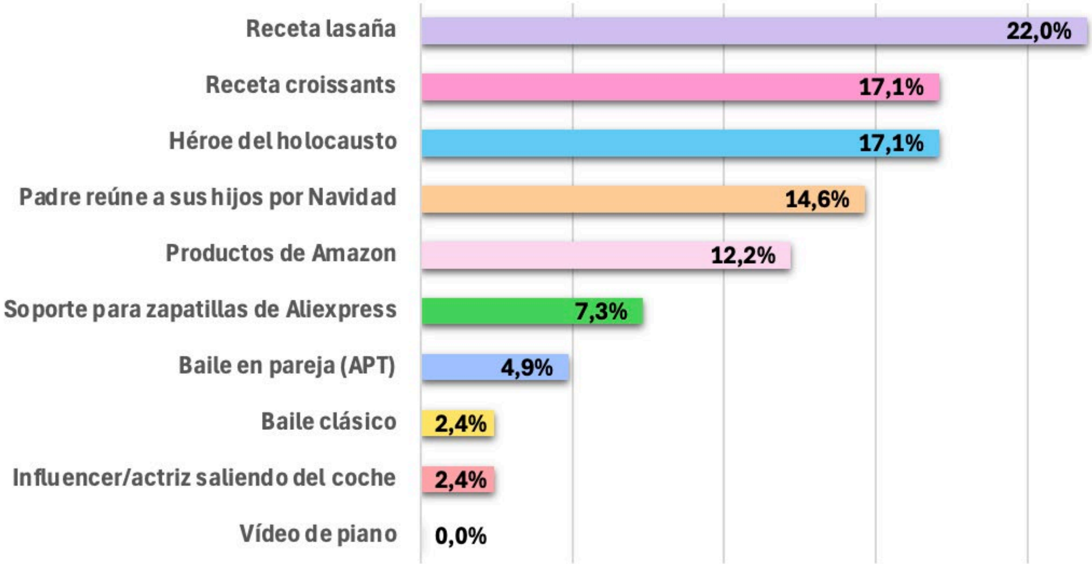
Figure 7. Engagement Rate (ER) per track.



Source: Compiled by the authors based on metrics obtained from TikTok as of 04/02/2025.

However, when analysing the Virality Index (VI), a differential pattern emerges: stimuli with EDR values above the 75th percentile (P75, calculated from the distribution of EDR recorded in the experimental sample) tend to exceed the mean VI of the dataset, regardless of music typology (Figure 8). This effect is particularly evident in instrumental content, which achieves comparable or even higher levels of dissemination despite lower conscious preference.

Figure 8. Virality Index (VI) per track.



Source: Compiled by the authors based on metrics obtained from TikTok as of 04/02/2025.

These results indicate a consistent association between higher levels of implicit emotional activation (EDR) and a greater propensity for intentional social dissemination (VI), suggesting that non-conscious affective intensity constitutes a relevant predictor of viral performance, even in the absence of an explicit declarative preference for the content.

4.5. Integrative Synthesis of Results

Overall, a clear distinction emerges between implicit processing and conscious evaluation. Instrumental music favours sustained attention and activation, whereas lyrical music enhances visible interaction.

The integration of physiological indicators (EDL, EDR), emotional profiles (Ekman, 2007), and behavioural indices (ER, VI) suggests that viral potential does not depend on declared preference, but rather on the intensity of the implicit emotional mechanisms activated during exposure. This finding reinforces the relevance of neuromarketing approaches for the strategic evaluation of audiovisual content.

5. Discussion

The results enable an analysis of the role of music as a modulator of the cognitive–emotional processing of audiovisual content on short-form video platforms such as TikTok. The triangulation of neurophysiological indicators (EDA), automated emotional analysis, declarative responses, and real interaction metrics makes it possible to interpret how music typology influences three interrelated levels of digital engagement: physiological attention, implicit emotional activation, and observable behaviour on the platform.

5.1 Influence of Music Typology on Physiological Attention (RQ1)

Regarding RQ1, the findings indicate that instrumental music generates higher and more stable levels of physiological attention (EDL) than videos featuring lyrical music. This result is consistent with research on cognitive load in multimedia environments, which suggests that the coexistence of visual and linguistic stimuli may generate competition for available attentional resources (Wang et al., 2024; Ye et al., 2024).

This finding can be interpreted within the framework of the attention economy, which conceptualises attention as a limited resource in saturated media environments. On platforms such as TikTok, where content competes to capture attention within minimal time intervals, the ability to sustain EDL becomes decisive for communicative effectiveness. In this context, instrumental music may facilitate a more stable allocation of cognitive resources, contributing to a more continuous perceptual experience during audiovisual exposure.

5.2 Implicit Emotional Activation and the Affective Architecture of Content (RQ2)

Regarding RQ2, the results indicate that instrumental music also tends to generate slightly higher and more continuous levels of implicit emotional activation (EDR). This pattern suggests that instrumental music may function as a direct affective channel, enabling emotional activation without explicit linguistic mediation.

This finding is consistent with functional approaches to musical emotional experience, which emphasise the role of non-verbal music in affect regulation and in the generation of automatic emotional responses (Eerola et al., 2024). It also reinforces classical perspectives in the literature on music and audiovisual communication, which have highlighted how auditory stimuli can modulate the perception and evaluation of audiovisual content (Bruner, 1990; Kellaris et al., 1993; Oakes, 2007).

The temporal analysis further identifies key drivers of emotional activation, such as narrative turning points, choreographic synchrony, and functional product demonstrations, which intensify affective responses through the interaction between music, visual narrative, and editing rhythm.

From this perspective, music operates as a structural component of the affective architecture of the stimulus, capable of amplifying or modulating the emotional impact generated by visual elements.

5.3 Conscious Evaluation of Content and Perceptual Discrepancy (RQ3)

RQ3 examined how these differences in implicit processing are reflected in the conscious evaluation of content. Analysis of the post-exposure questionnaire reveals a higher declarative preference for videos featuring lyrical music, which are perceived as more memorable, attention-grabbing, and more likely to be shared.

This finding indicates a dissociation between implicit processing and conscious evaluation, as videos with instrumental music generated higher levels of EDL and implicit emotional activation, yet were not necessarily perceived as more appealing in participants' self-reports.

This type of discrepancy has been documented in neuromarketing research, which shows that declarative self-reports capture post hoc rationalised evaluations, but do not necessarily reflect the automatic emotional processes occurring during stimulus exposure (Bigné et al., 2025). In high-speed consumption environments such as short-form video platforms, a significant portion of cognitive–emotional processing occurs automatically and non-deliberatively.

In this regard, recent research in digital communication has emphasised that user behaviour on social platforms is strongly influenced by rapid and intuitive processing dynamics, in which the interaction between visual and auditory stimuli shapes user engagement with content (Xiao et al., 2026; Yang et al., 2025).

Furthermore, studies focusing on visual narratives on TikTok have shown how formal audiovisual composition strategies influence content perception and viewer attention (Martin-Neira et al., 2025). The findings of the present study extend this line of research by demonstrating that music typology can also contribute to divergence between implicit processing and conscious evaluation of content.

5.4 Implicit Emotional Activation and Social Dissemination of content (RQ4)

Regarding RQ4, a partial relationship is observed between implicit emotional activation (EDR) and the social dissemination of content (VI). In particular, videos that recorded levels of implicit emotional activation above the 75th percentile tended to exceed the average virality index, suggesting that non-conscious affective intensity may act as a relevant predictor of content's potential for social dissemination.

However, this relationship is not entirely linear. While the Engagement Rate (ER), based on visible interactions such as likes or comments, was higher in videos featuring lyrical music, the Virality Index (VI) showed clearer associations with elevated levels of implicit emotional activation.

The decision to share content does not depend solely on the emotional intensity generated during exposure, but also on its perceived social value, informational utility, or its capacity to reinforce users' social identity (Berger, 2025; Berger & Milkman, 2012; Yan & Hu, 2026). In this sense, implicit emotional activation may act as an initial trigger of affective resonance, whereas the final decision to disseminate content also depends on social and contextual factors.

On platforms such as TikTok, content dissemination is also mediated by the algorithmic logic of recommendation systems and by social clustering dynamics that structure the circulation of content within the network (Gerbaudo, 2025). In this context, implicit emotional activation can be understood as a facilitating condition of virality, although its ultimate impact depends on the interaction between stimulus, audience, and algorithm.

These results help explain the discrepancies in the literature regarding the role of lyrical music in audiovisual processing. While some studies have suggested that the presence of verbal content may enhance message memorability by reinforcing semantic encoding and associations with advertising content (Kellaris et al., 1993; Oakes, 2007), other research has highlighted its potential to generate cognitive interference in complex multimedia contexts by competing for processing resources between visual and linguistic channels (Wang et al., 2024; Ye et al., 2024).

The findings of the present study suggest that both interpretations may coexist depending on the level of analysis considered and the media context in which exposure occurs. At a physiological level, instrumental music appears to favour more sustained attention and more stable emotional activation during content exposure. However, at the declarative and behavioural levels, lyrical music may reinforce conscious evaluation and stimulate forms of visible interaction on the platform.

This distinction between implicit processing and conscious evaluation helps to explain the apparently contradictory findings in the existing literature (Bigné et al., 2025). It can also be interpreted from the perspective of the attention economy. On short-form video platforms such as TikTok, the reduction of cognitive interference may facilitate a more stable allocation of attentional resources, while the presence of verbal content may enhance memorability (Xiao et al., 2026; Yang et al., 2025).

In this regard, the effect of music typology is not uniform, but rather depends on the level of processing considered (physiological, perceptual, or behavioural) and on the audiovisual consumption context characteristic of contemporary algorithmic ecosystems.

5.5 Theoretical and Methodological Implications

Overall, the findings indicate that the relationship between music, emotion, and digital behaviour should be understood as a multilevel process connecting sensory stimuli, cognitive–emotional processing, and observable behavioural responses.

From a theoretical perspective, the study integrates approaches from neuromarketing, the attention economy, and social content dissemination to explain how musical stimuli influence the transformation of cognitive–emotional experience into observable digital behaviour.

From a methodological standpoint, the consistency observed between biosignals, facial analysis, and interaction metrics supports the usefulness of multimethod approaches in marketing and digital communication research, as recommended by recent studies on the application of neurophysiological tools in marketing research (Bigné et al., 2025). Moreover, synthesis-based research drawing on multiple neuroimaging studies has shown that neural activity can predict message effectiveness beyond conscious declarative evaluation (Scholz et al., 2025).

Furthermore, the use of real TikTok videos contributes to strengthening the ecological validity of the experimental design, bringing psychophysiological analysis closer to real conditions of audiovisual consumption. This approach is consistent with recent research assessing the reliability of neurophysiological metrics applied to dynamic audiovisual content (van Diepen et al., 2025).

Taken together, these findings reinforce the idea that understanding digital engagement in contemporary audiovisual environments requires integrative models capable of linking internal neurocognitive processes with observable social behaviours within algorithmically driven media ecosystems.

6. Conclusions

This study provides empirical evidence on the modulatory role of music in cognitive–emotional processing on TikTok, demonstrating its differentiated influence on attention, emotional activation, and digital behaviour. Instrumental music favours more sustained attention and more stable emotional activation, whereas lyrical music reinforces conscious evaluation and visible interaction.

The findings reveal a dissociation between implicit processing and observable behaviour, indicating that virality does not depend exclusively on declared preference, but rather on the intensity of emotional activation generated during exposure.

From a methodological perspective, the research reinforces the validity of multimethod triangulation approaches for the study of digital behaviour. The convergence—and in some cases divergence—between physiological, emotional, and behavioural indicators highlights that content performance on social platforms cannot be fully understood solely through visible metrics such as likes or comments. The integration of implicit and explicit metrics enables a more precise capture of the complexity of multimodal processing that characterises contemporary audiovisual consumption. In this sense, implicit emotional activation emerges as a key explanatory factor of the social dissemination potential of content in digital environments.

From an applied perspective, the strategic importance of music selection in the production of audiovisual content for high-attention-competition environments is emphasised. Music should not be understood as a merely ornamental element, but as a narrative and sensory variable capable of modulating attention, emotional response, and social interaction. The identification of emotional drivers and inhibitors also provides operational criteria for the design of audiovisual content optimised for short-form video platforms, where communicative effectiveness largely depends on the ability to capture attention, generate affective resonance, and stimulate social circulation within the algorithmic ecosystem.

However, the study presents certain limitations that open up new avenues for future research. The sample size and controlled experimental context call for caution in generalising the findings. Future studies could expand the socio-demographic diversity of the sample, incorporate complementary measurement techniques such as eye tracking or neuroimaging, and explore different cultural contexts and digital platforms comparatively. In addition, longitudinal analysis of algorithmic performance would allow for a deeper understanding of the relationship between implicit emotional activation and the dynamics of social content dissemination.

This research contributes to understanding the neurocognitive mechanisms underlying digital engagement and virality in accelerated audiovisual environments. The findings show that the emotional architecture of musical stimuli constitutes a key component in the transformation of users' internal experience into observable social behaviour. In this way, the study provides empirical evidence for the strategic design of audiovisual content on social platforms, highlighting the role of music as a central element in optimising digital engagement and the social dissemination of content.

7. Acknowledgements

This work forms part of the consolidated research group TALENTO (G24/3-16) at CEU San Pablo University, dedicated to the study of skills, communication and digital environments from an applied perspective. Furthermore, the study is linked to the activities of the Aula CEU–Sociograph© Programme, a university–business collaboration initiative aimed at driving innovation in neuromarketing, fostering the development of research skills among students, and promoting knowledge transfer between the university and the professional world.

The authors would like to thank Ángel Bartolomé, from the TALENTO research group, for his collaboration, as well as the technical and research team at Sociograph© (*Sociograph Neuromarketing Science*) for their support in carrying out the study.

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