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Viral Global Foods and Local Culinary Resilience: Spatiotemporal Search Attention and Marketing Strategy in Indonesia, 2019-2026

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Abstract – Local culinary businesses face a recurring marketing dilemma when a foreign food goes viral: whether to treat the surge as a temporary episode or as a lasting shift that calls for repositioning. This study asks whether search attention to viral foreign foods displaces attention to local foods in Indonesia persistently or only episodically. Monthly Google Trends data for January 2019-September 2026 (93 months) compared three global foods (tteokbokki, croissant, bulgogi) with three format-matched Indonesian foods (batagor, bakpia, empal gentong); a regional export covered 34 provinces. The global share of combined relative search interest (RSI) was compared across a pre-pandemic baseline, a viral episode (March 2020-December 2022), and a recent period using regression with calendar-month controls and Newey-West standard errors. The global share rose by 12.9 percentage points during the episode ($p < .001$) but returned to baseline afterward (+0.7 points, $p = .498$); global foods held a majority in only 17 of 93 months. The episode was driven by tteokbokki, which later fell below its baseline, while croissant gained steadily, indicating that global attention rotated rather than disappeared. Bakpia, the most place-anchored local food, recovered above baseline, whereas batagor declined. Regionally, 19 provinces were local-majority, 11 global-majority, and four tied, ranging from 63% global in Bali to 80% local in Yogyakarta. The results support a four-regime typology of episodic displacement, persistent local resilience, trend substitution, and spatial specialization, and suggest that local marketers should answer viral waves with reversible, regionally targeted tactics while protecting provenance.

Keywords: Google Trends, culinary marketing, local food, viral food, digital attention, food tourism, Indonesia.

Abstrak – *Pelaku usaha kuliner lokal menghadapi dilema pemasaran yang berulang ketika makanan asing menjadi viral: apakah lonjakan itu episode sementara atau pergeseran permanen yang menuntut reposisi. Penelitian ini menjawab apakah perhatian pencarian terhadap makanan asing yang viral menggeser perhatian terhadap makanan lokal di Indonesia secara persisten atau hanya episodik. Data bulanan Google Trends Januari 2019-September 2026 (93 bulan) membandingkan tiga makanan global (tteokbokki, croissant, bulgogi) dengan tiga makanan Indonesia berformat setara (batagor, bakpia, empal gentong), ditambah data regional 34 provinsi. Pangsa global dari total relative search interest (RSI) dibandingkan antara periode dasar sebelum pandemi, episode viral (Maret 2020-Desember 2022), dan periode terkini menggunakan regresi dengan kontrol bulan kalender dan galat baku Newey-West. Pangsa global naik 12,9 poin persentase selama episode ($p < 0,001$), tetapi kembali ke tingkat dasar sesudahnya (+0,7 poin; $p = 0,498$); makanan global hanya mendominasi 17 dari 93 bulan. Episode tersebut digerakkan oleh tteokbokki, yang kemudian turun di bawah tingkat dasarnya, sedangkan croissant terus naik, sehingga perhatian global berotasi alih-alih menghilang. Bakpia, makanan lokal yang paling melekat pada tempat asalnya, pulih di atas tingkat dasar, sedangkan batagor menurun. Secara regional, 19 provinsi didominasi makanan lokal, 11 makanan global, dan empat seimbang, dari 63% global di Bali hingga 80% lokal di Yogyakarta. Temuan ini mendukung tipologi empat rezim, yaitu displacement episodik, ketahanan lokal, substitusi tren, dan spesialisasi spasial, serta menyarankan agar pemasar lokal merespons gelombang viral dengan taktik yang dapat dihentikan dan ditargetkan per wilayah sambil melindungi identitas asal produk.*

Kata kunci*: Google Trends, pemasaran kuliner, makanan lokal, makanan viral, perhatian digital, wisata kuliner, Indonesia.*

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INTRODUCTION

When a foreign dish goes viral, local culinary businesses face a recurring marketing decision. A restaurant, street-food vendor, souvenir producer, or destination marketer must judge whether the surge is

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a passing episode that can be met with short-term tactics or a lasting shift in consumer attention that calls for new products, repositioning, or redirected budgets. Misreading the surge is costly in both directions. Treating a temporary wave as permanent wastes investment and can dilute the authenticity on which local foods compete, whereas dismissing a lasting shift allows competitors to capture consumers' consideration. This study refers to this decision problem as the viral-response dilemma. The dilemma is becoming more pressing because food competition in the platform economy increasingly begins as competition for attention: consumers encounter culinary products through search engines, short-form video, influencer content, delivery applications, and maps before many purchase or visit decisions are made, and algorithmic platforms increasingly broker the attention and advertising reach that conventional media once controlled (Alvin et al., 2025; Lizar, 2026).

Indonesia illustrates the dilemma clearly. Korean popular culture has made Korean dishes highly visible, and studies of Indonesian consumers associate exposure to Korean culture, food curiosity, and country image with the intention or decision to buy Korean food (Jeong & Choi, 2019; Puspita et al., 2022; Setiawan et al., 2024). At the same time, local foods remain important markers of place, tourism experience, and cultural identity, and they compete through authenticity, sensory appeal, and association with a destination rather than through novelty alone (Almansouri et al., 2022; Huete-Alcocer & Hernandez-Rojas, 2022; Li et al., 2023; Thio et al., 2024). Digital communication can amplify these attributes through storytelling and creator-led promotion (Abdul Latip et al., 2024; Widjanarko et al., 2024; Masmoudi & Jmour, 2025). A spike in attention to a foreign dish therefore does not by itself show that local foods have lost relevance: search activity may reflect curiosity, recipe seeking, entertainment, or tourism planning, and an attention shock may coexist with continued interest in local foods.

Existing evidence offers limited help with this dilemma because it rarely observes duration or geography. Most studies of foreign and local food consumption measure attitudes or intentions at one point in time, which cannot show whether interest in a viral dish persists, fades, or moves to another dish, and they seldom compare regional markets. Google Trends offers a normalized, near-real-time record of relative search activity across time and place. Although its indices are not absolute search volumes and must be interpreted with care (Rovetta, 2024; Mikulic & Baumgartner, 2025), they make it possible to follow global and local foods jointly over a period long enough to separate a passing episode from lasting change. Few marketing studies have used such data for this purpose.

This study therefore addresses one main research question (RQ): does search attention to viral foreign foods displace attention to local foods in Indonesia persistently, or only episodically? Three sub-questions divide the main question into the parts a marketer needs. SRQ1 (when) asks how the global foods' share of combined attention changed between a pre-pandemic baseline, the viral episode of 2020-2022, and the recent period. It answers the main question directly, because persistent displacement would leave the share above its baseline after the episode. SRQ2 (which foods) asks which foreign and local foods drove these changes. It shows whether global attention returned to local foods or rotated to another foreign food, and which local foods resisted, so that the aggregate answer is not misread. SRQ3 (where) asks whether the balance between global and local attention differs across Indonesian provinces, which tests whether the national answer holds in each regional market. Together, the answers indicate when, against which competitors, and where local culinary marketers should respond.

To answer these questions, the study compares three global or foreign-trend foods (tteokbokki, croissant, and bulgogi) with three format-matched Indonesian foods (batagor, bakpia, and empal gentong) using Google Trends data from January 2019 to September 2026; the reasons for this window are given in the Research Method section. The study makes two contributions. Theoretically, it treats global-local food competition as competition for attention with a temporal and a spatial structure, and it proposes a four-regime typology that links attention patterns to marketing responses. Practically, it translates these regimes into decisions for culinary marketing, place branding, and geographic segmentation that address the viral-response dilemma directly.

LITERATURE REVIEW

Global culinary virality and competitive attention. Social media and platform culture accelerate the circulation of food imagery, recipes, restaurant experiences, and influencer recommendations. A systematic review by Rini et al. (2024) shows that social media can shape food-related attitudes and behavior through exposure, social influence, and engagement. Observational learning is also relevant: seeing food influencers

can stimulate imitation of cooking practices (Sokolova et al., 2024), while creator credibility can affect restaurant engagement and purchase intention (Kumsawat et al., 2025). In tourism settings, social media sharing and influencer relationships can connect food discovery with destination experience and behavioral intentions (Bilro et al., 2025; Soonsan et al., 2025; Soonsan & Kattiyapornpong, 2026). These mechanisms help explain why individual dishes can experience sharp attention surges without requiring long-term category change.

The Korean Wave provides a concrete example of transnational culinary diffusion in Indonesia. Korean food consumption has been linked to cultural exposure, curiosity, perceived image, and purchase intention across Indonesian samples (Jeong & Choi, 2019; Puspita et al., 2022; Setiawan et al., 2024). However, foreign-food popularity should not be treated as a single stable competitor. Different dishes can occupy different stages of diffusion, and consumer attention may rotate from one globally recognizable format to another. For marketing analysis, this suggests monitoring a portfolio of trend signals rather than a single iconic product.

Local food authenticity, place branding, and digital adaptation. Local culinary products hold strategic value because they connect consumption to place, memory, identity, and tourism experience. Recent research shows that authenticity can depend on ingredients, culinary knowledge, preparation, and cultural context, while local cuisine can strengthen destination image and loyalty (Almansouri et al., 2022; Huete-Alcocer & Hernandez-Rojas, 2022; Kaur & Kaur, 2024). Gastronomic identity is also linked to cultural sustainability and destination differentiation (Cheng et al., 2024; Paunic et al., 2024). These findings imply that local foods need not compete only on novelty; they can compete through provenance, sensory experience, and symbolic ownership of place.

Three constructs from this literature are central to the present study, and each needs a working definition. *Authenticity* refers to consumers' judgement that a food is genuine to its origin, recipe, ingredients, and preparation tradition. In local-food consumption it operates together with the novelty, sensory, and social dimensions of the eating experience; these dimensions jointly build tourists' cultural competence and, through it, their intention to consume the food again (Lin et al., 2023). Indonesian evidence points in the same direction: among domestic tourists in Denpasar, Solo, Bandung, and Yogyakarta, the quality of the culinary experience, driven mainly by food quality, increased culinary and destination satisfaction as well as revisit, recommendation, and repurchase intentions (Jokom et al., 2025). *Place branding* refers to the use of a place's distinctive assets to build a recognizable and valued identity. Gastronomy is widely treated as a sign of a destination's identity and cultural heritage (Lin et al., 2021), and gastronomic experiences feed back into destination image, especially among tourists already familiar with the food (Kovalenko et al., 2023). Food-based place brands are strongest when producers, restaurants, institutions, and visitors form a coordinated gastronomic ecosystem rather than a set of isolated products (Muñiz-Martinez & Florek, 2023), and regional restaurants can turn place-branded foods into a source of differentiation (Lopes et al., 2022). For a product such as bakpia, place branding therefore means that the food and the city of Yogyakarta reinforce each other's identity. *Digital adaptation* refers to the translation of these assets into platform-native communication without losing the cues that signal origin. Memorable local culinary experiences shared by TikTok creators increase revisit intention, and creator endorsement strengthens this effect (Shoukat et al., 2023). Digital adaptation is thus a communication strategy, not a change to the product itself.

Digitalization nevertheless changes how authenticity is communicated. Social-media narratives can both safeguard and commercialize food heritage (Zheng, 2023). TikTok and other platforms compress culinary stories into visual, imitable formats that can broaden reach but also encourage standardization (Fuste-Forne & Orea-Giner, 2024; Fuste-Forne & Filimon, 2025). Research on heritage storytelling and strategic communication therefore emphasizes the importance of translating local culinary meaning into platform-native content without erasing its cultural anchors (Widjanarko et al., 2024; Masmoudi & Jmour, 2025). For younger consumers, sustainability values and food influencers can further shape interest in traditional food (Kristia et al., 2024).

This literature supports a managerial distinction between product identity and communication format. A local food can retain its recipe logic, origin, and production story while adapting packaging, plating, creator partnerships, or short-form content. Such adaptation is consistent with evidence on three further indicators. Influencer attachment, the emotional bond that followers form with a content creator, increases the persuasive effect of the creator's food recommendations; food consumption value, the functional, emotional, social, and epistemic benefits consumers expect from a food, shapes their intention to try it; and

social-media framing, the way a destination or dish is visually and narratively presented online, influences destination image and travel responses (Park & Lee, 2022; Zhu et al., 2023; Thio & Palumian, 2025). The strategic risk is therefore not innovation itself but innovation that weakens the cues through which consumers recognize the food's origin and authenticity.

Search data as marketing intelligence. Google Trends has been used as a high-frequency indicator in tourism demand analysis and forecasting, where search data can add timeliness but also require careful normalization and validation (Havranek & Zeynalov, 2021; De Luca & Rosciano, 2024; Mikulic & Baumgartner, 2025). Rovetta (2024) stresses reproducibility, query documentation, and caution against treating Google Trends values as absolute counts. For culinary marketing, these limitations are particularly important because a high index can be driven by information seeking rather than purchase. Search data are therefore most defensible as an early-stage behavioral signal that can be combined with transactions, reservations, delivery-app activity, or social-media metrics.

A second methodological issue is geography. Food and tourism responses are spatially differentiated: local-food value, destination imagery, and social-media assets vary by place and audience (Lee et al., 2024; Leow et al., 2024). A national trend can therefore conceal regional markets where global foods dominate the compared attention set and other markets where local products are much stronger. Integrating temporal and regional Google Trends exports allows the present study to operationalize this heterogeneity as competitive attention rather than assuming one national market state.

Because this study measures competition through search behavior, the indicators used to answer the research questions are defined here. *Relative search interest (RSI)* is the Google Trends index of how often a topic is searched in a given period and place, scaled from 0 to 100 relative to the highest point among the compared topics; it measures relative attention, not the number of searches. The *global attention share* is the proportion of combined RSI held by the three global foods in a month or region; a value above 50% means that global foods attract most of the attention within the compared set. A *period difference* is the change in RSI or in the share between a pre-pandemic baseline and a later period, and it shows whether a gain in attention persists or fades. *Co-movement* is the rank correlation between the monthly RSI of two foods and shows whether attention to them rises and falls together. *Regional orientation* classifies each province as global-majority, local-majority, or tied according to its global attention share. The global attention share and its period differences answer SRQ1, food-level period differences and co-movement answer SRQ2, and regional orientation answers SRQ3.

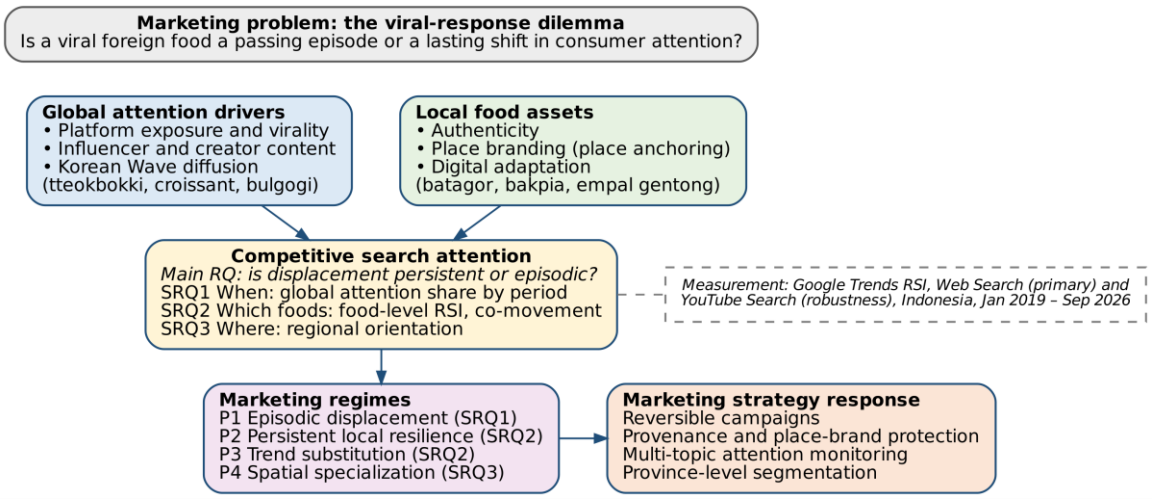


Figure 1. Conceptual framework: the viral-response dilemma, the main research question (RQ) and its sub-questions (SRQ1-SRQ3), the four propositions (P1-P4), and the corresponding marketing responses.

Conceptual framework. Figure 1 summarizes how the reviewed literature leads to the research questions. Its starting point is the viral-response dilemma: culinary products compete for a limited pool of consumer attention in digital channels, where platforms rather than traditional media increasingly decide what audiences see (Alvin et al., 2025), and local marketers must judge whether a surge in attention to a foreign food is temporary or lasting. Two forces shape this competition. On the global side, platform exposure, influencer content, and the Korean Wave can generate attention shocks for foreign foods (Rini et

al., 2024; Setiawan et al., 2024; Kumsawat et al., 2025). On the local side, authenticity, place-brand association, and digital adaptation provide assets that can sustain attention to local foods (Lin et al., 2023; Muñiz-Martinez & Florek, 2023; Shoukat et al., 2023). The balance between the two is observed as competitive search attention over time (SRQ1 and SRQ2) and across space (SRQ3).

The framework leads to four propositions, each tied to a sub-question. *P1, episodic displacement*: the global attention share rises above its baseline during a viral episode but returns to baseline afterward (SRQ1). The alternative, persistent displacement, would leave the share above baseline after the episode, so P1 is the direct test of the main research question. *P2, persistent local resilience*: a local food with strong place association retains or regains attention after the episode (SRQ2). *P3, trend substitution*: attention lost by one global food moves to another global food rather than back to local foods (SRQ2). *P4, spatial specialization*: provinces differ in which group dominates attention (SRQ3). Each regime calls for a different marketing response, ranging from reversible campaigns to provenance protection, multi-topic monitoring, and geographic segmentation.

METHOD

Research design and data. The study used an observational digital-trace design based on four comparative Google Trends exports (a time-series and a regional export for Web Search, the primary source, and the same pair for YouTube Search) retrieved by the author from the Google Trends Explore interface (https://trends.google.com). The time-series file contained monthly observations from January 2019 through September 2026 (93 months). Both exports were retrieved on 7 October 2026 from a single comparison request (Google, 2026a), so that all six queries share the same normalization base, using these settings: location, Indonesia (ID); time range, 1 January 2019 to 30 September 2026; category, All categories; search property, Web Search; and query type, Google Knowledge Graph Topic rather than free-text search term. The Topic identifiers were tteokbokki (/m/026spzd), empal gentong (/m/0gywyzk), batagor (/m/0ds61fb), bulgogi (/m/02flbl), croissant (/m/015wgc), and bakpia (/m/02r709k). For a range of this length Google Trends returns monthly values, so no temporal aggregation was performed by the author, and the final observation covers the complete month of September 2026. For a cross-platform robustness check, the same request was repeated in the same session with the search property set to YouTube Search (Google, 2026b), yielding a second time-series and regional pair. The regional file contained comparative values for 34 Indonesian geographic units. These units follow Google's subdivision geography, which does not report separately the Papuan provinces created in 2022. Six queries were present in both exports: tteokbokki, croissant, bulgogi, batagor, bakpia, and empal gentong. The first three were classified as the global or foreign-trend set and the latter three as the local Indonesian set according to the selection procedure described below.

Study period. The window from January 2019 to September 2026 was chosen for four reasons. First, starting in January 2019 provides fourteen monthly observations, including one complete seasonal cycle, before the first COVID-19 cases were reported in Indonesia in March 2020; this baseline is needed to judge whether later surges departed from normal attention. Second, the window covers both the pandemic period and the post-pandemic recovery, so that a period of disrupted routines and a return to more normal consumption can be compared within one series. Third, September 2026 was the most recent complete month at the time of retrieval, which keeps the panel current without including a partial month. Fourth, the resulting 93 monthly observations contain more than seven annual cycles, which is sufficient for calendar-month controls and for autocorrelation-robust inference with a 12-lag bandwidth, and a range longer than five years makes Google Trends return monthly rather than weekly values, so that each observation aggregates more searches for the low-volume dishes. The window does include a change that Google Trends marks as an improvement to its data-collection system from 1 January 2022, and an analysis of Google's health-trends data documented a discontinuity at the same date (Myburgh, 2022). Because such a change affects all six Topics in the same month, the monthly global attention share, which compares Topics within the same month, is less exposed to it than the level of any single series; the main comparison was also re-estimated without 2022 as a robustness check.

Query selection rationale. Dozens of foreign and Indonesian foods could plausibly have been studied, so the comparison set was restricted deliberately rather than exhaustively. Three properties of Google Trends data made a small, jointly retrieved set preferable to a long list of keywords. First, relative search interest (RSI) values are normalized within a single request: each value is scaled to the highest point among

all terms requested together for the selected time and place (Google, n.d.-a; Google, n.d.-b). Global and local shares are interpretable only when every term sits on this common scale, which requires the terms to be retrieved jointly; series from separate requests cannot be pooled without rescaling through a shared anchor term, a step that adds sampling and rounding error. Second, Google Trends reports integers from 0 to 100. Adding a term whose search volume is an order of magnitude larger than the others compresses the remaining series toward the bottom of the scale, so that lower-volume foods can be rounded to very small values or to zero and lose the month-to-month variation that the trend and share analyses require. National staples and generic dish words (e.g., rendang, nasi goreng, bakso, or seblak) and globally generic foods (e.g., pizza, sushi, or ramen) were excluded from the main panel for this reason, and because, as broad topics, they also absorb recipe, restaurant-category, and franchise searches that are not specific to one culinary product. Third, a share measure is sensitive to the number of terms in each group; an unequal or long list would allow the larger group to dominate the share mechanically.

Within these constraints, the six terms were chosen using four a priori criteria (Table 1). (1) Format matching: each global query was paired with a local query from the same consumption format, so that global-local contrasts compare comparable eating occasions rather than unrelated products. Tteokbokki and batagor are savoury street snacks, croissant and bakpia are flaky baked pastries, and bulgogi and empal gentong are beef-based main dishes. (2) Archetype coverage: the global set combines two widely recognized Korean dishes, reflecting the Korean Wave route of food diffusion documented among Indonesian consumers (Jeong & Choi, 2019; Puspita et al., 2022; Setiawan et al., 2024), with one non-Korean Western café product, so that "global" is not reduced to Korean food. The local set covers a nationally diffused street snack originating in Bandung (batagor), a destination souvenir strongly anchored in Yogyakarta (bakpia), and a regional heritage dish from Cirebon with limited national diffusion (empal gentong). (3) Entity specificity: each food was entered as a Google Knowledge Graph Topic rather than a free-text term, which pools spelling variants and languages referring to the same dish and separates it from homonyms, and each Topic denotes one specific dish rather than a broad food category. (4) Data sufficiency: each Topic had to return a non-zero value in every month of the national Web Search series, so that no time series was censored at zero; all six met this criterion (minimum monthly RSI = 5). In the regional export, five Topics were non-zero in all 34 regions, whereas empal gentong returned 0 in two regions (North Maluku and West Sulawesi), consistent with its position as a niche regional dish. These values were retained because the regional analysis relies on group sums rather than on single-Topic values. Because any composition-based share depends on the terms entered, the robustness of the main conclusions to this choice was tested with the balanced sensitivity analysis described under Robustness checks.

Table 1. Query selection: format-matched pairs, archetypes represented, and data-sufficiency checks (national series, n = 93 months; regional export, n = 34 regions)

Query	Group	Format pair	Archetype represented	Min. monthly RSI	Regions with RSI > 0
Tteokbokki	Global	Street snack	Korean Wave street food	11	34/34
Batagor	Local	Street snack	Nationally diffused street snack (Bandung origin)	17	34/34
Croissant	Global	Baked pastry	Western café and bakery product	8	34/34
Bakpia	Local	Baked pastry	Place-anchored destination souvenir (Yogyakarta)	19	34/34
Bulgogi	Global	Beef main dish	Korean restaurant dish	5	34/34
Empal gentong	Local	Beef main dish	Regional heritage dish (Cirebon)	5	32/34

Google Trends values were treated as relative search interest (RSI), not absolute search counts. Comparative Google Trends data are normalized to the selected time, geography, and query set, and regional values are normalized by search activity within each location (Google, n.d.-a; Google, n.d.-b). The regional file was audited before analysis; the six term values summed to 100 in every region. Accordingly, regional results were interpreted as the within-region composition of attention among the six compared terms, not as a comparison of total search volume between provinces.

Data set-up. The CSV files were imported without manual editing. The Time column was parsed as the first day of each month, and each month was assigned to one of three periods defined from the pandemic

timeline before estimation: baseline (January 2019-February 2020, 14 months), viral episode (March 2020-December 2022, 34 months), and recent (January 2023-September 2026, 45 months). No file contained missing cells or "<1" entries, and the Web Search time series contained no zero values. Zeros in the regional and YouTube Search exports were retained as reported, because Google Trends uses 0 to indicate insufficient search volume relative to the peak. No imputation, recoding, or outlier removal was performed. Global and local group totals were computed as the unweighted sum of the three RSI values in each group, separately for each month and each region.

Measures. The main outcome is the monthly global attention share, GS = 100 × (sum of the three global RSI values ÷ sum of all six RSI values). A value above 50% means that the three global foods held a majority of combined attention in that month, and a change in GS indicates displacement between the two groups. Because GS compares Topics within the same month and request, it is less sensitive than any single series to changes in overall search volume. The food-level outcomes are the monthly RSI values of the six foods.

Analysis for SRQ1 and SRQ2. The same period-comparison regression, estimated by ordinary least squares (OLS), was used for the global attention share and for each food:

$$Y_t = b_0 + b_1\,\mathrm{EPISODE}_t + b_2\,\mathrm{RECENT}_t + \Sigma_k\, c_k\,\mathrm{MONTH}_{k,t} + e_t \quad (1)$$

Y_t is the global attention share (SRQ1) or the RSI of one food (SRQ2) in month t. $\mathrm{EPISODE}_t$ equals 1 from March 2020 to December 2022, and RECENT_t equals 1 from January 2023 onward; the baseline period is the reference category. The coefficient b_1 is therefore the average difference between the episode and the baseline, and b_2 is the average difference between the recent period and the baseline, both measured in percentage points for GS and in RSI points for a food. The eleven calendar-month dummies $\mathrm{MONTH}_{k,t}$ remove recurring seasonal patterns, such as year-end holiday peaks, that could otherwise be mistaken for period differences. The coefficients map directly onto the main research question: persistent displacement implies $b_2 > 0$ for GS, whereas episodic displacement implies $b_1 > 0$ with b_2 close to zero. A Wald test of $b_2 - b_1 = 0$ indicates whether attention changed significantly after the episode. Equation 1 describes differences between periods and is not interpreted as a causal model.

Statistical inference. Monthly search series are usually serially correlated, which makes conventional standard errors too small. The residuals of Equation 1 were therefore tested for autocorrelation with the Durbin-Watson statistic (Durbin & Watson, 1950) and the Breusch-Godfrey test at 12 lags, covering one annual cycle (Breusch, 1978; Godfrey, 1978), and for heteroskedasticity with the Breusch-Pagan test (Breusch & Pagan, 1979). The residuals were autocorrelated in all seven models (Breusch-Godfrey $p \leq .032$), and heteroskedasticity was detected for tteokbokki (Breusch-Pagan $p = .010$) (Appendix Table A1). All tests therefore use Newey-West heteroskedasticity-and-autocorrelation-consistent (HAC) standard errors (Newey & West, 1987) with a Bartlett kernel and 12 lags, and significance is assessed at $\alpha = .05$. To complement the regressions for SRQ2, Spearman rank correlations between the monthly series ($n = 93$) describe whether two foods rise and fall together or move in opposite directions; because the series are autocorrelated, these coefficients are used descriptively.

Analysis for SRQ3. For each province, the global and local shares of the six-food regional composition and their difference were calculated, and provinces were classified as global-majority (>50%), local-majority (<50%), or tied (=50%). Because Google Trends normalizes regional values within each location, these shares describe the composition of attention within a province, not differences in total search volume between provinces. Six-month centered moving averages are used only for visualization.

Robustness checks. Three checks examine whether the answer to the main question depends on analytical choices. First, Equation 1 for GS was re-estimated with a 3-lag bandwidth, with the episode ending in December 2021, and without 2022 to avoid the Google Trends data-collection change; a linear time trend was also estimated as an alternative specification. Second, because a share depends on the foods compared, Equation 1 was re-estimated for all nine balanced two-versus-two subsets obtained by removing one global and one local Topic. Third, Equation 1 was estimated with the YouTube Search exports, and agreement between platforms was summarized with Spearman correlations between the two monthly global-share series ($n = 93$) and between the two sets of regional shares ($n = 34$). All analyses were performed in Python 3 with pandas 3.0.2, SciPy 1.17.1, and statsmodels 0.15.0 (Seabold & Perktold, 2010); the raw exports and the analysis script are provided as supplementary material. The approach follows recent recommendations that Google Trends research should document normalization, query construction, and inferential limits (Rovetta, 2024; Mikulic & Baumgartner, 2025).

Abbreviations. RSI = relative search interest; GS = global attention share; RQ = research question; SRQ = sub-research question; OLS = ordinary least squares; HAC = heteroskedasticity-and-autocorrelation-consistent (Newey-West) standard errors; DW = Durbin-Watson statistic; BG = Breusch-Godfrey test; BP = Breusch-Pagan test; rho = Spearman rank correlation coefficient; pp = percentage points; KPI = key performance indicator; Topic = an entity in Google's Knowledge Graph that groups searches referring to the same dish across spellings and languages.

RESULT AND DISCUSSION

Results

Attention levels. Table 2 summarizes attention to the six foods. Bakpia had the highest overall mean RSI (M = 31.68), followed by tteokbokki (M = 28.26), which was also the most volatile series (SD = 18.65) and reached the maximum RSI of 100 in April 2021. Batagor (M = 23.61) and croissant (M = 17.04) followed, while bulgogi (M = 8.34) and empal gentong (M = 8.12) were lower-volume signals within the panel. Figure 2 shows the monthly series and the six-month moving global attention share.

Table 2. Relative search interest (RSI) and global attention share by period, January 2019-September 2026 (n = 93 months)

Outcome	Overall mean (SD)	Peak (month)	Baseline (n = 14)	Episode (n = 34)	Recent (n = 45)
Global attention share (%)	44.70 (8.00)	70.30 (May 2021)	39.86	52.36	40.41
Tteokbokki	28.26 (18.65)	100 (Apr 2021)	27.14	45.35	15.69
Croissant	17.04 (5.77)	44 (Dec 2023)	9.43	15.97	20.22
Bulgogi	8.34 (2.56)	16 (Jul 2021)	5.93	10.00	7.84
Batagor	23.61 (4.93)	45 (Apr 2020)	25.29	27.26	20.33
Bakpia	31.68 (6.37)	53 (Dec 2023)	31.93	26.94	35.18
Empal gentong	8.12 (2.96)	24 (Jun 2024)	7.00	7.97	8.58

Note. Baseline = January 2019-February 2020; episode = March 2020-December 2022; recent = January 2023-September 2026. Period columns show means. The global attention share is expressed in percent.

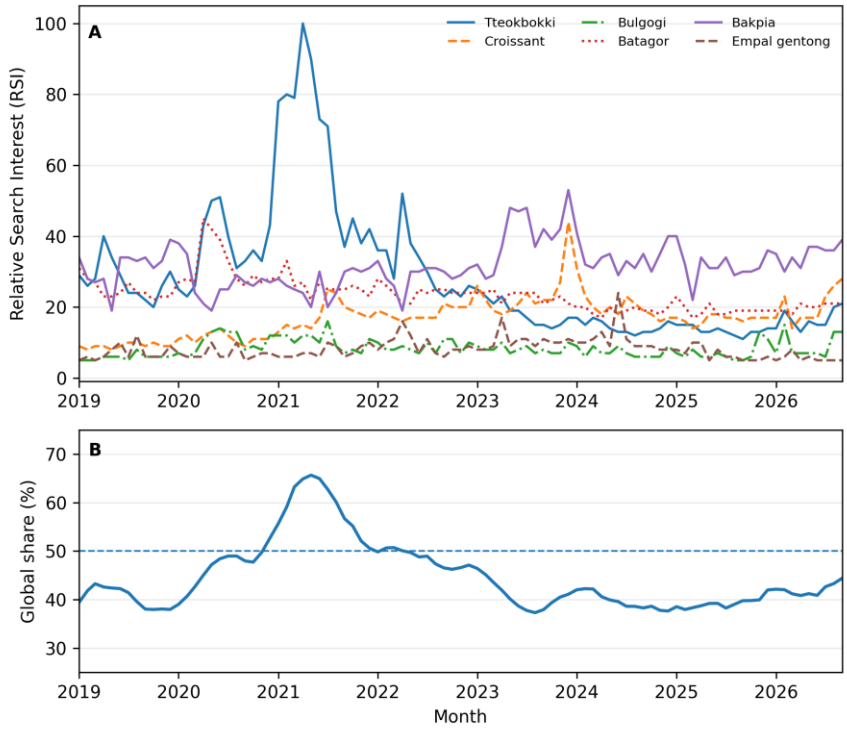


Figure 2. Temporal competition among the six culinary queries. (A) Monthly RSI for the three global/foreign-trend and three local-food queries. (B) Six-month moving mean of the global-food share of combined six-query attention; 50% indicates equal global and local shares.

SRQ1: Was displacement persistent or episodic? The global attention share averaged 39.86% in the baseline, rose to 52.36% during the episode, and returned to 40.41% in the recent period (Table 2). Controlling for calendar month, the share was 12.86 percentage points (pp) above baseline during the episode ($p < .001$), but only 0.69 pp above baseline in the recent period, a difference that was not statistically significant ($p = .498$); the decline from the episode to the recent period was significant (-12.16 pp, $p < .001$) (Table 3). Global foods held more than half of combined attention in 17 of the 93 months (18.3%), and 16 of these months fell within the episode (Figure 2B). The answer to SRQ1 is therefore that displacement was episodic: global foods gained a temporary majority but did not keep it, which supports P1.

Table 3. Period-comparison estimates from Equation 1 for the global attention share and the six foods.

Outcome	Episode vs. baseline, b1 (SE)	Recent vs. baseline, b2 (SE)	Recent vs. episode, b2 - b1	Adj. R^2
Global attention share (pp)	+12.86** (2.44)	+0.69 (1.02)	-12.16**	0.51
Tteokbokki	+19.03** (7.14)	-11.23** (1.10)	-30.26**	0.55
Croissant	+6.75** (1.53)	+10.99** (1.56)	+4.24*	0.41
Bulgogi	+4.14** (0.60)	+1.96** (0.47)	-2.18**	0.26
Batagor	+2.31 (1.90)	-4.80** (0.78)	-7.11**	0.40
Bakpia	-4.96** (1.34)	+3.41† (1.74)	+8.37**	0.45
Empal gentong	+0.81 (0.84)	+1.45 (1.18)	+0.64	-0.01

Note. OLS with eleven calendar-month dummies (n = 93); reference period = baseline (January 2019-February 2020). Newey-West HAC standard errors (12 lags) in parentheses; the last column is the Wald-tested difference b2 - b1. The global attention share is in percentage points; foods are in RSI points. ** $p < .01$; * $p < .05$; † $p < .10$.

SRQ2: Which foods drove the change? The food-level estimates show that the episode was carried mainly by tteokbokki, whose RSI was 19.03 points above baseline during the episode ($p = .008$) but 11.23 points below baseline in the recent period ($p < .001$). Croissant moved in the opposite direction: it was 6.75 points above baseline during the episode and 10.99 points above baseline in the recent period (both $p < .001$), so its gain continued after tteokbokki receded, and the two series were negatively correlated (rho = -.347). Bulgogi was above baseline in both periods (+4.14 and +1.96 points, both $p < .001$). Among local foods, bakpia fell below baseline during the episode (-4.96 points, $p < .001$) and recovered to 3.41 points above baseline in the recent period ($p = .051$; $p = .031$ with a 3-lag bandwidth), reaching its highest monthly value of 53 in December 2023. Batagor did not change significantly during the episode (+2.31 points, $p = .224$) but was 4.80 points below baseline in the recent period ($p < .001$), and empal gentong showed no significant change in either period. Co-movement was mixed rather than uniformly negative: tteokbokki moved with batagor (rho = .777) and against bakpia (rho = -.561), whereas croissant moved with bakpia (rho = .360). The answer to SRQ2 is that global attention rotated from tteokbokki toward croissant rather than returning to local foods, and that local resilience was specific to bakpia. These results support P3 and, for bakpia, P2.

SRQ3: Did the balance differ across provinces? The national result concealed strong regional differences. Of 34 provinces, 19 were local-majority, 11 global-majority, and four tied (Table 4; Figure 3). Bali had the strongest global orientation (63%), led by croissant (36% of its six-food composition), followed by North Sumatra (57%). The Special Region of Yogyakarta was the most local-oriented province (80% local), with bakpia alone accounting for 64% of its composition, followed by Gorontalo (68%) and North Maluku (67%). Global-majority provinces included Jakarta, Banten, Bali, West Nusa Tenggara, the Riau Islands, and several provinces in Sumatra and Kalimantan, whereas local-majority provinces included Central and East Java, Yogyakarta, most of Sulawesi, Maluku, and Papua. The answer to SRQ3 is that the balance between global and local attention differs by province, which supports P4.

Robustness checks. The answer to the main question did not depend on the analytical choices (Appendix Table A2). The episode increase in the global share remained positive and significant, and the recent share remained statistically indistinguishable from baseline, with a 3-lag bandwidth (recent vs. baseline, $p = .602$), when the episode was ended in December 2021 (+15.25 pp, $p < .001$; +2.38 pp, $p = .140$), and when 2022 was excluded (+15.31 pp, $p < .001$; +0.75 pp, $p = .479$); a linear time trend likewise showed no persistent increase (-1.13 pp per year, $p = .191$). Across the nine two-versus-two Topic subsets, the episode increase was positive and significant in every case (+9.30 to +14.36 pp, all $p \leq .002$), and in all six subsets that retained tteokbokki the share fell significantly after the episode (all $p \leq .008$), returning to

or below baseline in five of them (Appendix Table A3). In the three subsets without tteokbokki, the share remained above baseline in the recent period (+10.64 to +16.87 pp), reflecting the sustained growth of croissant. On YouTube Search, where tteokbokki dominated in every period, the episode increase was smaller and not significant (+4.57 pp, p = .141), but the recent share was again not above baseline (-6.53 pp, p = .002); monthly global shares on the two platforms were positively correlated (rho = .614), and regional shares more strongly so (rho = .816, n = 34). Because the YouTube series contained 25 zero-valued months for low-volume Topics, Web Search remains the primary measure.

Table 4. Regions with the strongest global- and local-oriented competitive attention in the six-query regional export

Region	Orientation	Group share	Dominant query	Query share
Bali	Global	63%	Croissant	36%
North Sumatra	Global	57%	Tteokbokki	31%
West Kalimantan	Global	55%	Tteokbokki	30%
West Sumatra	Global	55%	Tteokbokki	30%
Yogyakarta	Local	80%	Bakpia	64%
Gorontalo	Local	68%	Bakpia	46%
North Maluku	Local	67%	Bakpia	44%
West Papua	Local	62%	Bakpia	38%

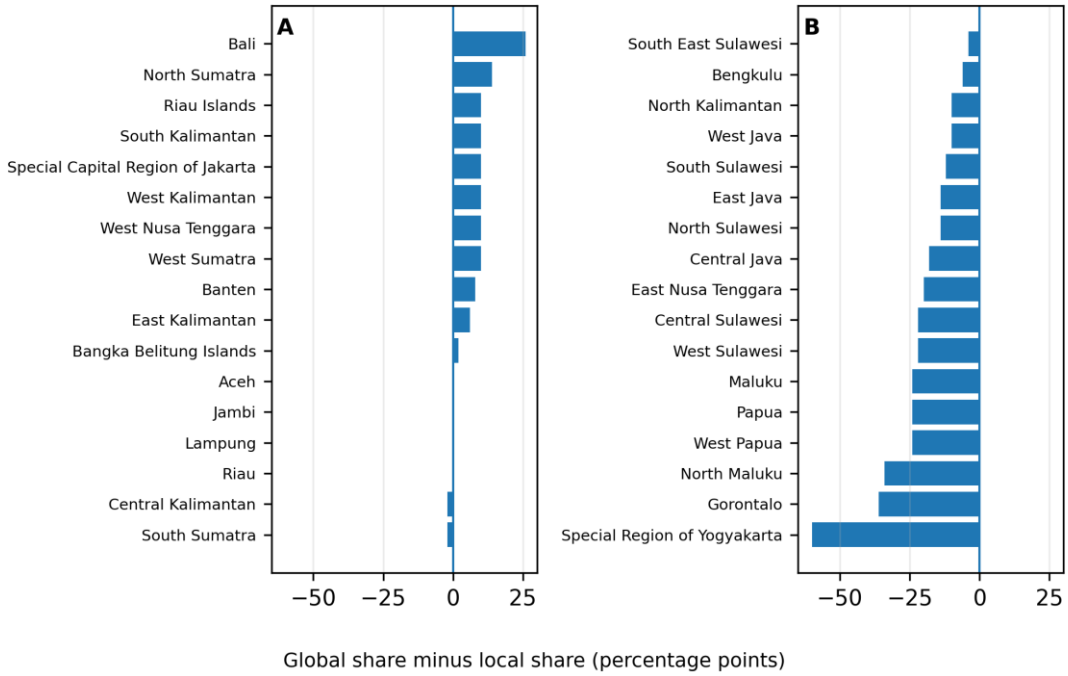


Figure 3. Regional competitive attention balance. Values show global share minus local share within each region's six-query composition; positive values indicate global-majority attention and negative values indicate local-majority attention

Discussion

The main finding is that viral foreign foods displaced local foods in Indonesian search attention only episodically. Global foods gained a clear but temporary advantage in 2020-2022 that disappeared afterward; within that pattern, global attention shifted from tteokbokki to croissant, local resilience was concentrated in bakpia, and the balance varied strongly by province. For the viral-response dilemma, this means that a viral foreign food should by default be treated as an episode to be managed rather than as a permanent change in the competitive landscape.

The episodic pattern is consistent with research showing that social media, food influencers, and creator credibility can rapidly redirect food attention through exposure, imitation, and curiosity (Rini et al., 2024; Sokolova et al., 2024; Zanzaizman et al., 2023; Kumsawat et al., 2025). The present results add that such redirection can be short-lived for a specific dish: the attention that made tteokbokki dominant in 2021 had fallen below its pre-pandemic level by the recent period, while the global category was sustained by a different product. Studies of Indonesian consumers link the Korean Wave to intentions to buy Korean food (Jeong & Choi, 2019; Puspita et al., 2022; Setiawan et al., 2024). The search evidence qualifies these findings rather than contradicting them: intentions measured at one point in time may overstate how long attention to an individual dish lasts, although they may still capture a durable interest in a cuisine as a whole, which six Topics cannot measure.

The recovery of bakpia and its 64% share in Yogyakarta are consistent with research linking authenticity, culinary experience quality, and place association to destination image and repeat consumption (Lin et al., 2021; Kovalenko et al., 2023; Lin et al., 2023; Jokom et al., 2025), with evidence that tourists' local-food consumption is tied to their travel experience (Wan et al., 2025), and with the view that food-based place brands are strongest when the product is embedded in a destination ecosystem (Lopes et al., 2022; Muñiz-Martinez & Florek, 2023). Batagor, a nationally diffused street snack with weaker place anchoring, declined after the episode, which suggests that local origin alone does not protect a product and that the strength of its link to a place matters. The regional pattern agrees with evidence that responses to food tourism and social-media content vary with place and distance (Lee et al., 2024; Leow et al., 2024).

Three alternative explanations deserve consideration. First, the episode coincided with the COVID-19 period, when home cooking, recipe searches, and the streaming of Korean entertainment may have raised interest in foreign dishes, while travel restrictions reduced searches for souvenir foods; the temporary dip in bakpia is consistent with this explanation. The period model cannot separate virality from pandemic conditions, so the episode is best interpreted as a viral surge amplified by an unusual context. Second, Google Trends changed its data collection in January 2022 (Myburgh, 2022), but excluding 2022 did not change the result. Third, the share depends on the foods compared: the episode appeared in every Topic subset, but whether global attention persisted afterward depended on whether tteokbokki or croissant carried the global signal, which is itself evidence of trend substitution rather than an artefact of the measure.

Table 5. Strategy matrix linking the four attention regimes to marketing objectives, actions, and monitoring indicators

Regime	Evidence in this study	Marketing objective	Actionable strategy	KPI to monitor
P1 Episodic displacement	Global share +12.86 pp above baseline in 2020-2022 but back at baseline afterward (+0.69 pp, n.s.); majority in 17 of 93 months	Capture spillover attention without eroding local identity	Limited-time items or toppings that pair local and trending formats; reactive short-video content; campaigns of 4-8 weeks with a planned end date	Three-month moving RSI against the pre-surge baseline; sales of campaign items
P2 Persistent local resilience	Bakpia below baseline during the episode (-4.96) but above it afterward (+3.41); 64% of attention in Yogyakarta	Protect and monetize provenance	Origin cues on packaging and menus; Yogyakarta-linked storytelling; consistent quality standards; souvenir and gift packs; e-commerce reach outside the place of origin	Branded search and RSI share outside the home region; repeat purchase
P3 Trend substitution	After the episode, tteokbokki 11.23 RSI points below and croissant 10.99 points above baseline	Anticipate the next global competitor	Monthly monitoring of a basket of at least five global and local Topics; quarterly menu review; adapt formats only after attention persists for several months	Rank changes within the monitored basket; persistence of increases
P4 Spatial specialization	19 local-majority, 11 global-majority, and 4 tied regions; Bali 63% global, Yogyakarta 80% local	Allocate budgets and creative geographically	Trend-led creative and collaborations in global-majority provinces (e.g., Bali, North Sumatra, Jakarta); provenance and culinary-route campaigns in local-majority provinces (e.g., Yogyakarta, Gorontalo, Maluku); province-level ad targeting	Provincial global attention share; cost per engagement by province

These findings indicate which marketing response fits each regime (Table 5). Episodic displacement calls for fast but reversible tactics, such as limited-time menu items or collaborations with a planned end date, rather than permanent repositioning. Persistent local resilience calls for protecting provenance,

quality, and place-linked storytelling while using creators and digital channels to reach buyers outside the place of origin (Shoukat et al., 2023; Widjanarko et al., 2024; Syarif et al., 2025). Trend substitution calls for monitoring a basket of competing foods rather than a single viral dish, because attention that leaves one foreign food can move to another. Spatial specialization calls for province-level budgets: trend-led creative in global-majority provinces and heritage, festival, and culinary-route campaigns in local-majority provinces (Leal Londono et al., 2022). In each case, search attention indicates when and where to act, whereas sales, reservations, or delivery-platform data should confirm whether the action pays off (Havranek & Zeynalov, 2021; Mikulic & Baumgartner, 2025).

CONCLUSION

Viral foreign foods displaced local foods in Indonesian search attention only temporarily. The global foods' share rose by about 13 percentage points during 2020-2022 and then returned to its pre-pandemic level; global attention rotated from tteokbokki to croissant rather than disappearing; bakpia, the most place-anchored local food, recovered after the episode; and the balance ranged from global-majority in Bali to strongly local in Yogyakarta. The take-home message for the viral-response dilemma is that a viral foreign food should be managed as an episode, not treated as a permanent shift to which local foods must surrender their identity.

Limitations and future research. Google Trends values are normalized and sampled rather than absolute counts, low-volume Topics may be noisy, and the shares depend on the six foods compared. The period comparison is descriptive and cannot separate virality from pandemic conditions, and the study does not observe sales, visits, advertising, or consumer demographics. Future research should extend the panel through anchor-term rescaling, link search attention to transaction, reservation, and social-media data, and use event-based designs to test whether attention shifts precede commercial outcomes.

Academic relevance. The study shows that global-local food competition has a temporal structure, separating short episodes from persistent shifts, that single-point surveys of food choice cannot observe. It extends research on authenticity and place branding with behavioral evidence that place anchoring appears as a geographic concentration of attention, as in bakpia and Yogyakarta, which coexists with global trends rather than opposing them. It also provides a four-regime typology and a replicable Google Trends design that other studies can test with different foods, countries, and platforms.

Managerial and social relevance. Local culinary businesses should monitor a basket of foreign and local food Topics monthly and act only on increases that persist for several months; answer viral foods with reversible tactics rather than repositioning; invest in provenance and place-linked storytelling for place-anchored products while renewing weaker local foods through creators and culinary routes; and allocate campaigns by province. Socially, the findings suggest that Indonesian culinary heritage is more resilient to viral foreign trends than is often assumed, provided that local foods remain visibly tied to their places of origin.

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AI DISCLOSURE

Claude (Anthropic) was used to assist with writing computer code for data compilation and statistical analysis. Grammarly was used to improve grammar, language accuracy, and overall clarity. All data, analytical decisions, statistical interpretations, and final conclusions were reviewed and verified by the authors, who take full responsibility for the content.

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APPENDIX

Table A1. Residual diagnostics for Equation 1 (n = 93 months)

Model	DW	BG (12 lags)	BP	Adj. R^2
Global attention share	0.68	48.85 (<.001)	22.06 (.055)	0.51
Tteokbokki	0.36	68.37 (<.001)	27.82 (.010)	0.55
Croissant	0.58	48.38 (<.001)	18.54 (.138)	0.41
Bulgogi	1.47	22.49 (.032)	14.46 (.342)	0.26
Batagor	0.66	46.55 (<.001)	20.16 (.091)	0.40
Bakpia	1.01	28.33 (.005)	19.22 (.116)	0.45
Empal gentong	1.21	36.50 (<.001)	17.83 (.164)	-0.01

Note. DW = Durbin-Watson statistic; BG = Breusch-Godfrey LM statistic with 12 lags; BP = Breusch-Pagan (Koenker) statistic. Values in parentheses are p-values.

Table A2. Robustness of the global attention share estimates to alternative specifications (percentage points; HAC p-values in parentheses)

Specification	Episode vs. baseline	Recent vs. baseline	Recent vs. episode
Main model (Equation 1, 12 lags)	+12.86 (<.001)	+0.69 (.498)	-12.16 (<.001)
3-lag bandwidth	+12.86 (<.001)	+0.69 (.602)	-12.16 (<.001)
Episode ends December 2021	+15.25 (<.001)	+2.38 (.140)	-12.87 (<.001)
Excluding 2022	+15.31 (<.001)	+0.75 (.479)	-14.56 (<.001)
YouTube Search	+4.57 (.141)	-6.53 (.002)	-11.10 (.001)

Note. A linear time trend fitted to the full series gave -1.13 pp per year (p = .191). The YouTube Search row uses the same six Topics and Equation 1.

Table A3. Equation 1 for the global attention share in the nine balanced two-versus-two Topic subsets (percentage points; HAC p-values in parentheses)

Global pair	Local pair	Episode vs. baseline	Recent vs. baseline	Recent vs. episode	Majority months
Tteokbokki + Croissant	Batagor + Bakpia	+13.15 (<.001)	+0.18 (.868)	-12.97 (<.001)	16
Tteokbokki + Croissant	Batagor + Empal gentong	+9.58 (<.001)	+2.39 (.029)	-7.20 (.008)	89
Tteokbokki + Croissant	Bakpia + Empal gentong	+14.31 (<.001)	-3.32 (.019)	-17.63 (<.001)	43
Tteokbokki + Bulgogi	Batagor + Bakpia	+12.58 (<.001)	-6.91 (<.001)	-19.49 (<.001)	11
Tteokbokki + Bulgogi	Batagor + Empal gentong	+9.30 (.002)	-5.56 (<.001)	-14.86 (<.001)	42
Tteokbokki + Bulgogi	Bakpia + Empal gentong	+13.95 (<.001)	-10.84 (<.001)	-24.79 (<.001)	30
Croissant + Bulgogi	Batagor + Bakpia	+11.21 (<.001)	+12.21 (<.001)	+1.01 (.512)	0
Croissant + Bulgogi	Batagor + Empal gentong	+10.26 (<.001)	+16.87 (<.001)	+6.62 (.002)	12
Croissant + Bulgogi	Bakpia + Empal gentong	+14.36 (<.001)	+10.64 (<.001)	-3.72 (.001)	2

Note. Majority months = number of months, out of 93, in which the two global Topics held more than 50% of the four-Topic attention.