Modelling cultural globalization on music streaming platforms

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Inequality and globalization in cultural markets

Cultural markets are 'winner-take-all:' measures of material success are very unequally distributed (Watts and Salganik 2011).

- e.g. ticket and book sales, auction prices, download and stream counts, etc.

Global dimension: in many contemporary markets, the highest levels of success can be achieved only by reaching global audiences.

Watts, Duncan J., and Matthew J. Salganik. 2011. "Social Influence: The Puzzling Nature of Success in Cultural Markets." Oxford Handbook of Analytical Sociology.

Models of cultural globalization

Hierarchical convergence: homogenization of cultural consumption based on forms produced in core/wealthy/powerful countries ('McDonaldsization')

- implies high inequality of material cultural success, with producers in central countries highly advantaged

Polycentric diffusion: less hierarchical, heterogeneous spread of cultural forms within different domains (Wimmer 2021)

- implies less inequality and multiple channels for regional and global success.
- supporting evidence from diffusion of Google search terms (Bail et. al. 2019) and music videos on Youtube (Dueñas and Mandel 2023).

Wimmer, Andreas. 2021. "Domains of Diffusion" AJS 126(6). doi: 10.1086/714273; Dueñas, Marco, and Antoine Mandel. 2023. "The Structure of Global Cultural Networks" 18(11). doi: 10.1371/journal.pone.0294149.

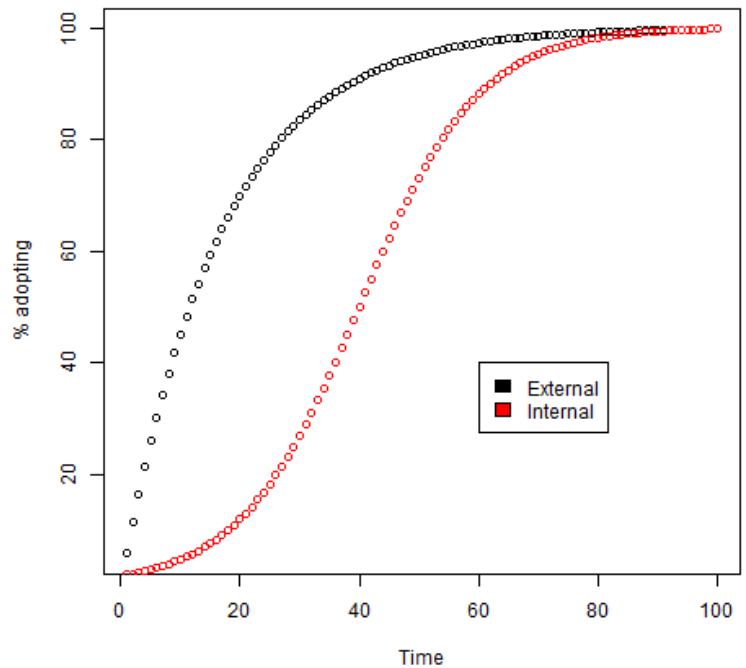
Globalization as diffusion process

In addition to **extent** of globalization, **temporal process** of globalization can be used to test theories.

- Global simultaneity consistent with hierarchical rather than polycentric models

Diffusion processes (Rossman 2012):

- Internal: endogenous, word-of-mouth social influence process
- External: exogenous process driven by 'broadcast' information and coordination (e.g. marketing)



Caveat: we cannot formally infer a social influence process from a logistic curve

Research context: music streaming

Music streaming platforms such as Spotify create a unified cultural marketplace with (near-) global reach.

- compare to pre-streaming world of radio play and physical album sales

Equalizing potential: platforms enable consumer choice, potentially giving artists opportunities to reach new audiences.

- evidence of increasing diversity of music consumption (Bello and Garcia 2021)

Or, consumption patterns on platforms may re-create inequalities.

- algorithmic curation, playlists, social media, online marketing, etc.

Bello, Pablo, and David Garcia. 2021. "Cultural Divergence in Popular Music: The Increasing Diversity of Music Consumption on Spotify across Countries." Humanities and Social Sciences Communications 8(1):182. doi: 10.1057/s41599-021-00855-1.

Research questions

Does hierarchical convergence or polycentric diffusion better describe globalization of music streaming?

Extent: How represented are artists from different regions and performing in different genres among globally successful songs?

Process: Do global diffusion trajectories differ for artists from different regions and performing different genres?

- Is the diffusion trajectory of 'core' artists'/genres' songs more consistent with external diffusion than for other artists/genres?
- e.g. does mainstream pop go global simultaneously while non-core genres diffuse more gradually?

For convenience, I'll use 'core' to refer to economically and politically dominant regions: North America and Western Europe.

Data: Spotify rankings

Daily stream counts for 200 most streamed songs in 68 countries between 2017 and 2021

- About 100k songs, 38k artists
- Artist genre collected from Spotify API
- Artist country (home market) collected from MusicBrainz database

Advantages: music streaming platform with largest market share

Limitations:

- Music consumption on Spotify is likely more global than all music consumption.
- Spotify not available in all countries (e.g. most African music consumption excluded from this dataset).
- Open data ended in late 2021

Classifying genre

Spotify assigns up to three genre labels to each artist

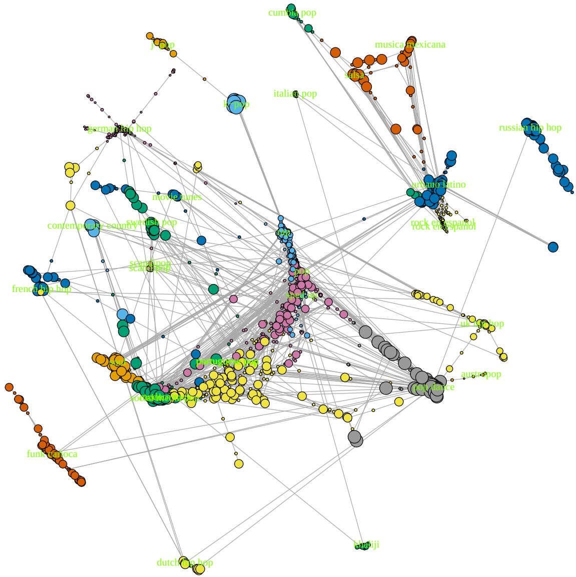
- ∼3000 unique genre descriptors
- substantial redundancy: e.g. 'K-pop' and 'K-pop boy band'
- Genres do not appear consistently nested

Data reduction: classify songs within genre complexes (Silver et. al. 2016)

Method: Generate bipartite artist-genre co-occurrence network and identify clusters using Leiden community detection.

- Reduces genre space to about 30 main genre complexes/clusters

Silver, Daniel, Monica Lee, and C. Clayton Childress. 2016. "Genre Complexes in Popular Music" PLOS ONE 11(5):e0155471. doi: 10.1371/journal.pone.0155471.


cumbia pop
musica mexicana
salsa
italian pop
russian hip hop
german hip hop
urbano latino
movie tunes
rock en espanol
contemporary country
swedish pop
scandipop
pop
french hip hop
sped up
uk hip hop
portuguese pop
austropop
pop dance
funk carioca
khaleeji
dutch hip hop

Most music consumption is local

73% of songs in top 200 anywhere only reach top 200 in one country.

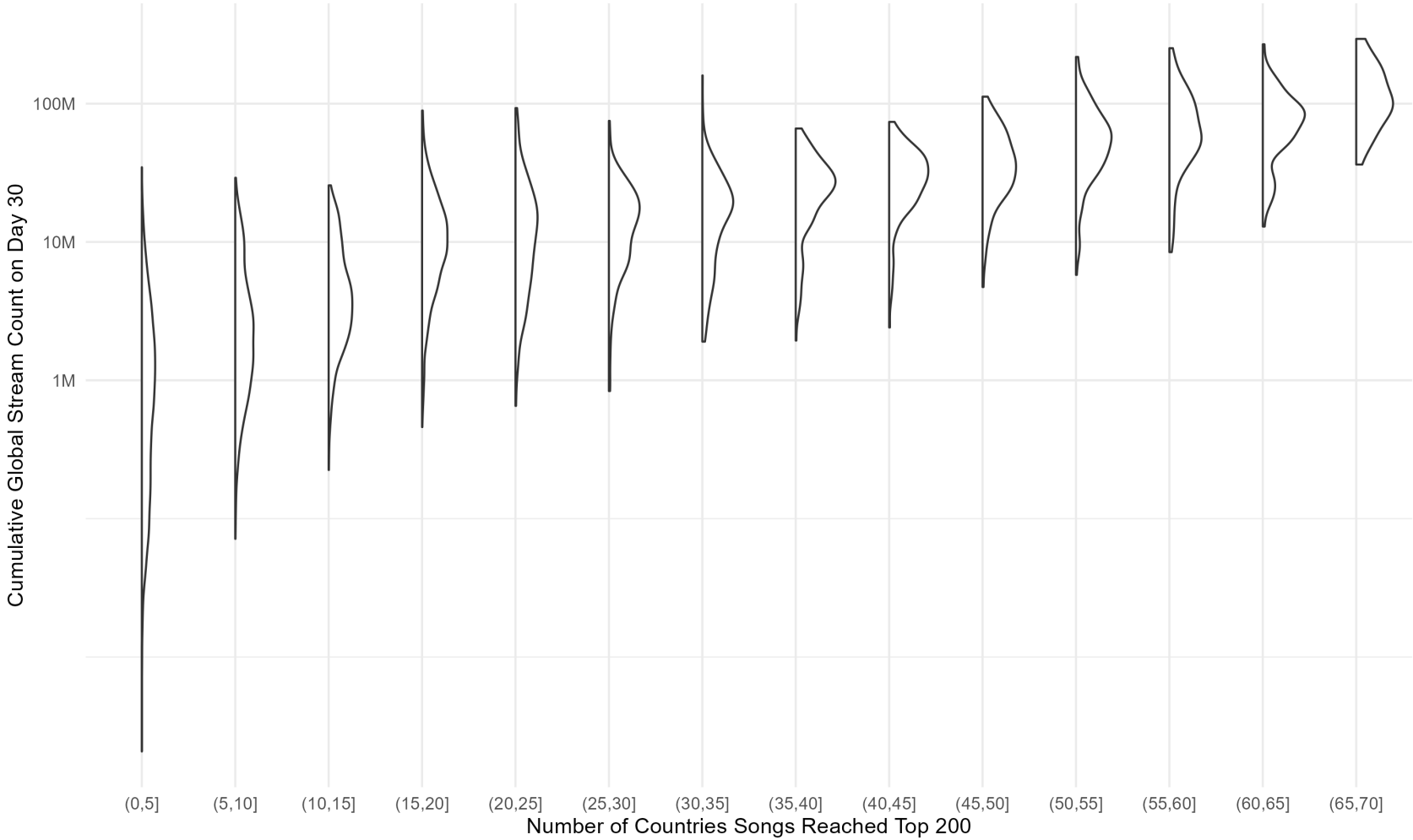
Strong evidence against cultural homogenization.

- However, this is more like non-globalization than polycentric diffusion

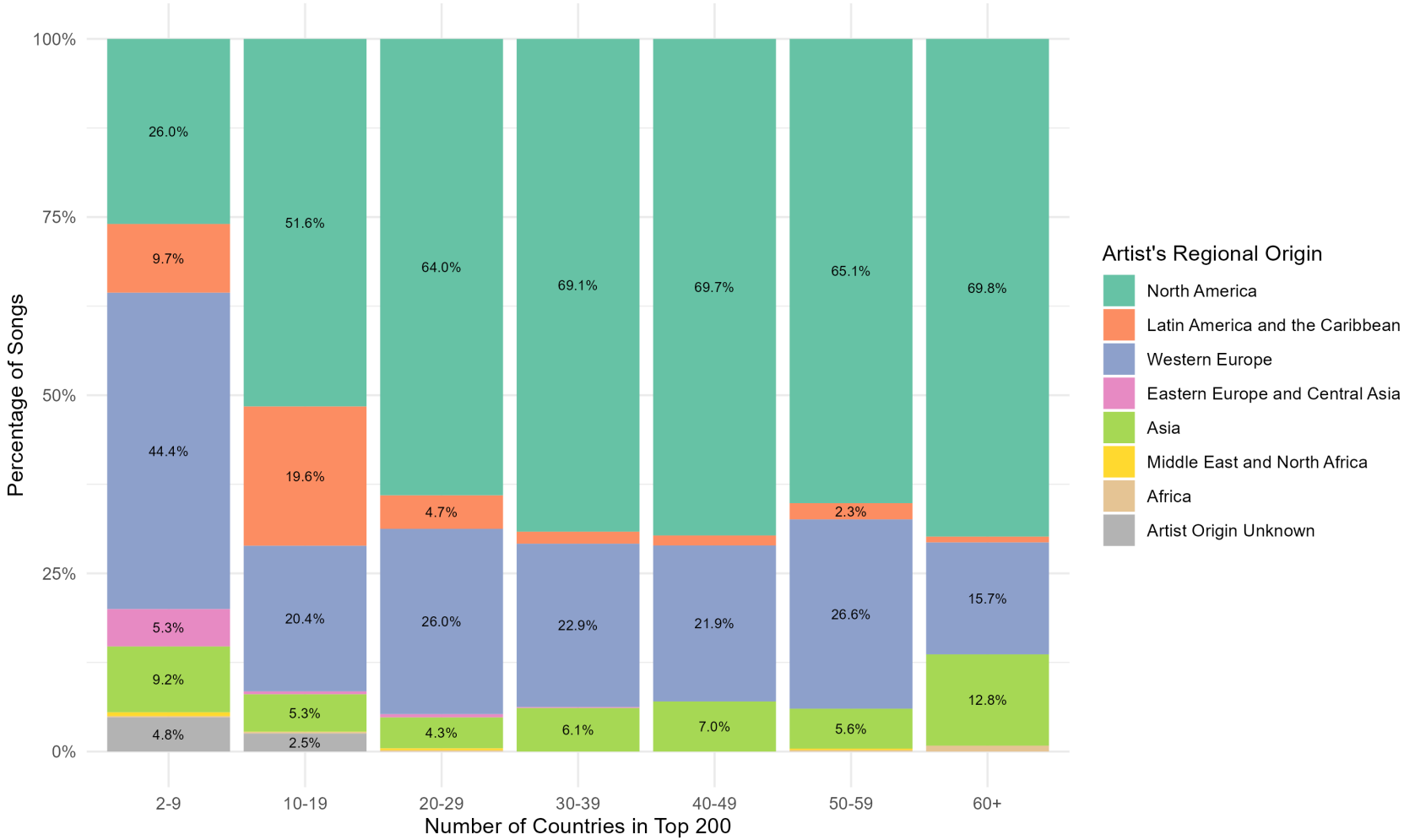
Important to bear in mind that selecting songs that do spread globally can be source of bias if we don't take this selection into account.

Bail, Christopher A., Taylor W. Brown, and Andreas Wimmer. 2019. "Prestige, Proximity, and Prejudice: How Google Search Terms Diffuse across the World." American Journal of Sociology 124(5):1496–1548. doi: 10.1086/702007.

If you want to be (really) big, you must be global

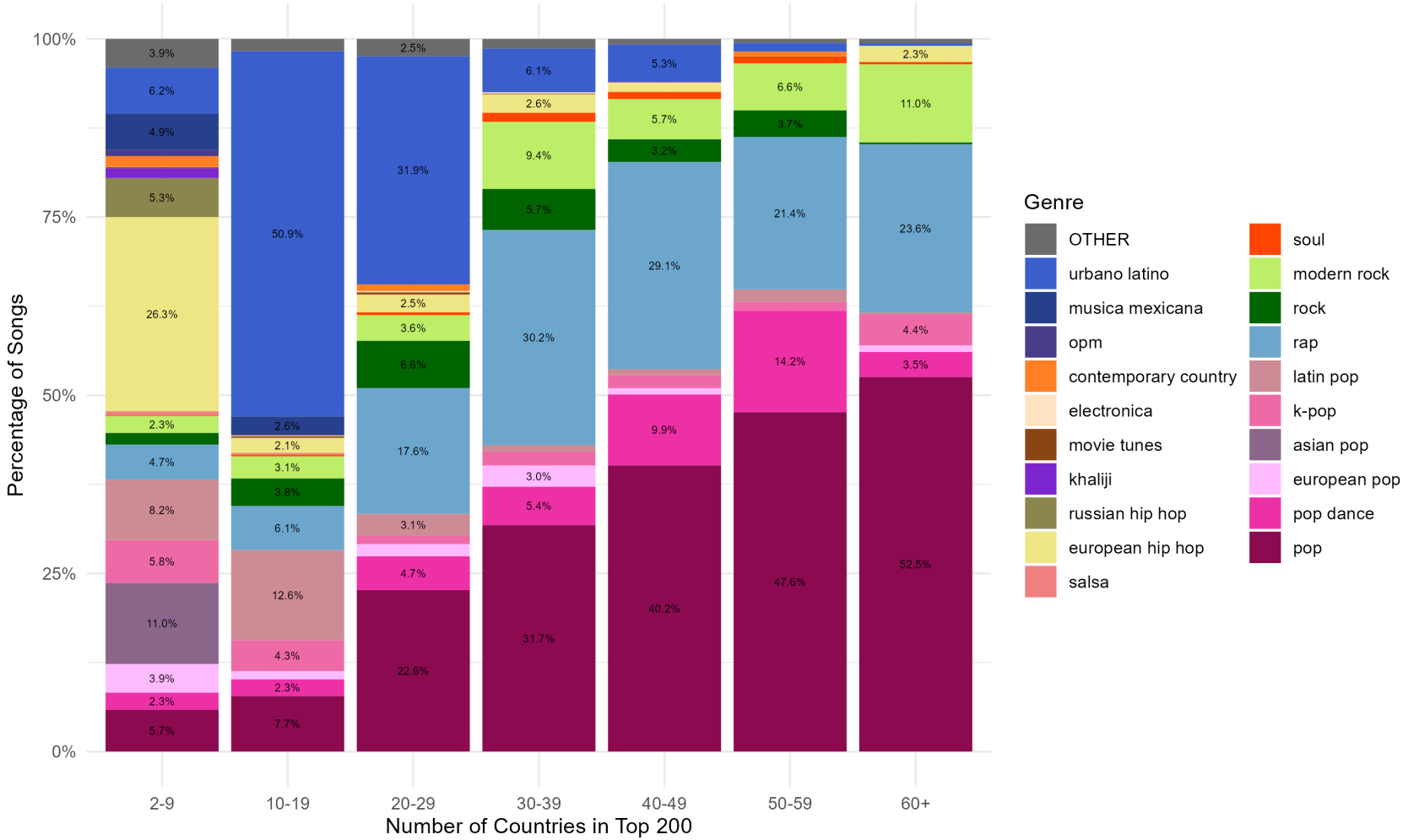


Songs by North American and West European artists are most globally successful



Note: Artists with missing country/region excluded. Non-core artists may be under-represented

Pop and (North American) rap are most globally successful



Note: songs with missing genre excluded. Non-core genres may be under-represented.

The story so far

Global hits (50+ countries) are dominated by North American and Western European pop, rap and modern rock.

- Main exception is K-pop, which has carved out a small but meaningful global niche
- Urbano latino and other Latin American genres have substantial regional/linguistic niche

Globalized music consumption privileges core countries and genres, though consumption more generally remains heterogeneous.

- More consistent with hierarchical than polycentric model, but without homogenization.

Modelling diffusion trajectories

Question: do diffusion trajectories vary by genre?

We model each song's diffusion process as a logistic growth curve:

$$y = \frac{\kappa \times y_0}{y_0 + (\kappa - y_0) \times exp(-\mu_{max} \times time))}$$

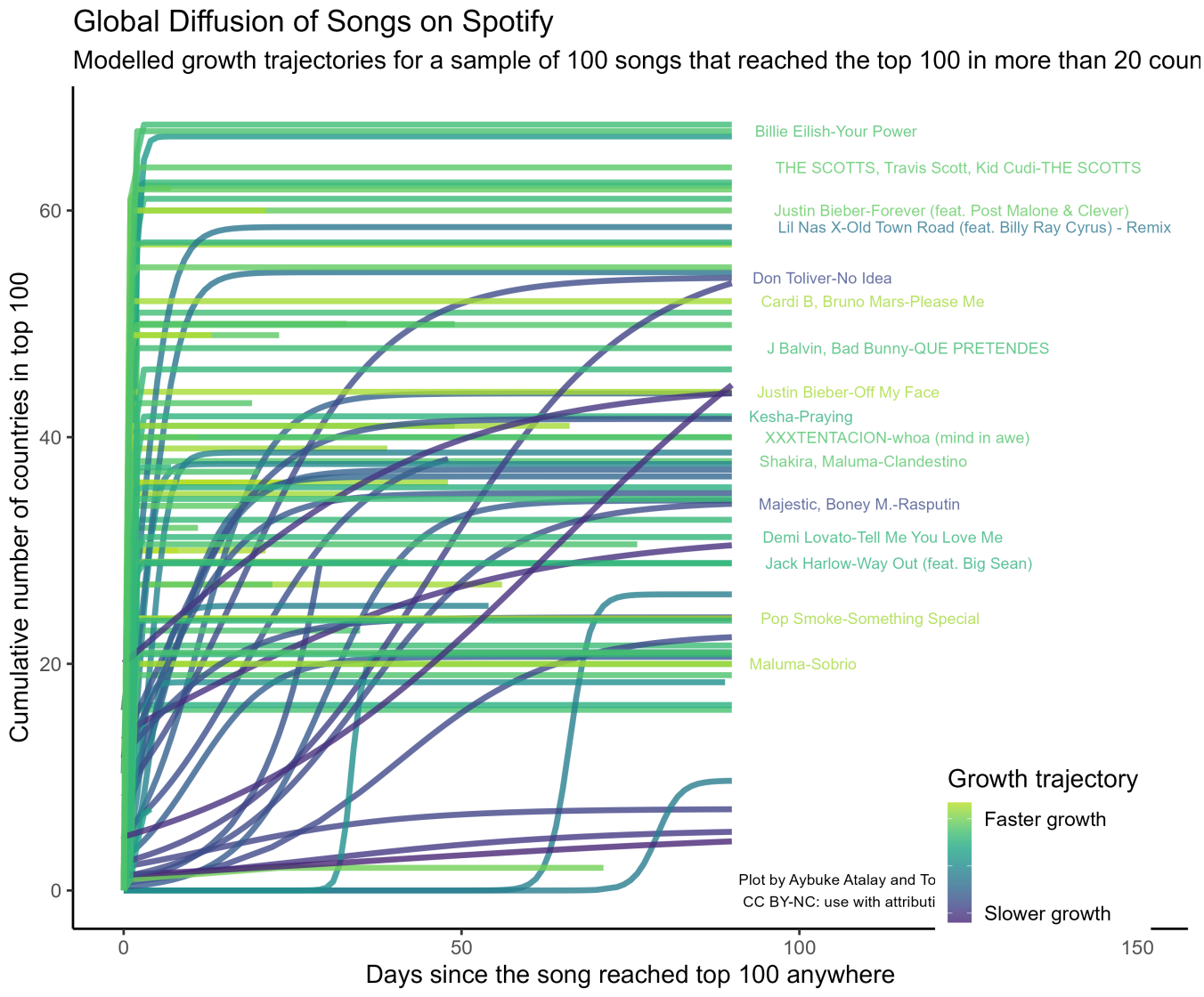
y: cumulative countries

y_0: countries on day 1

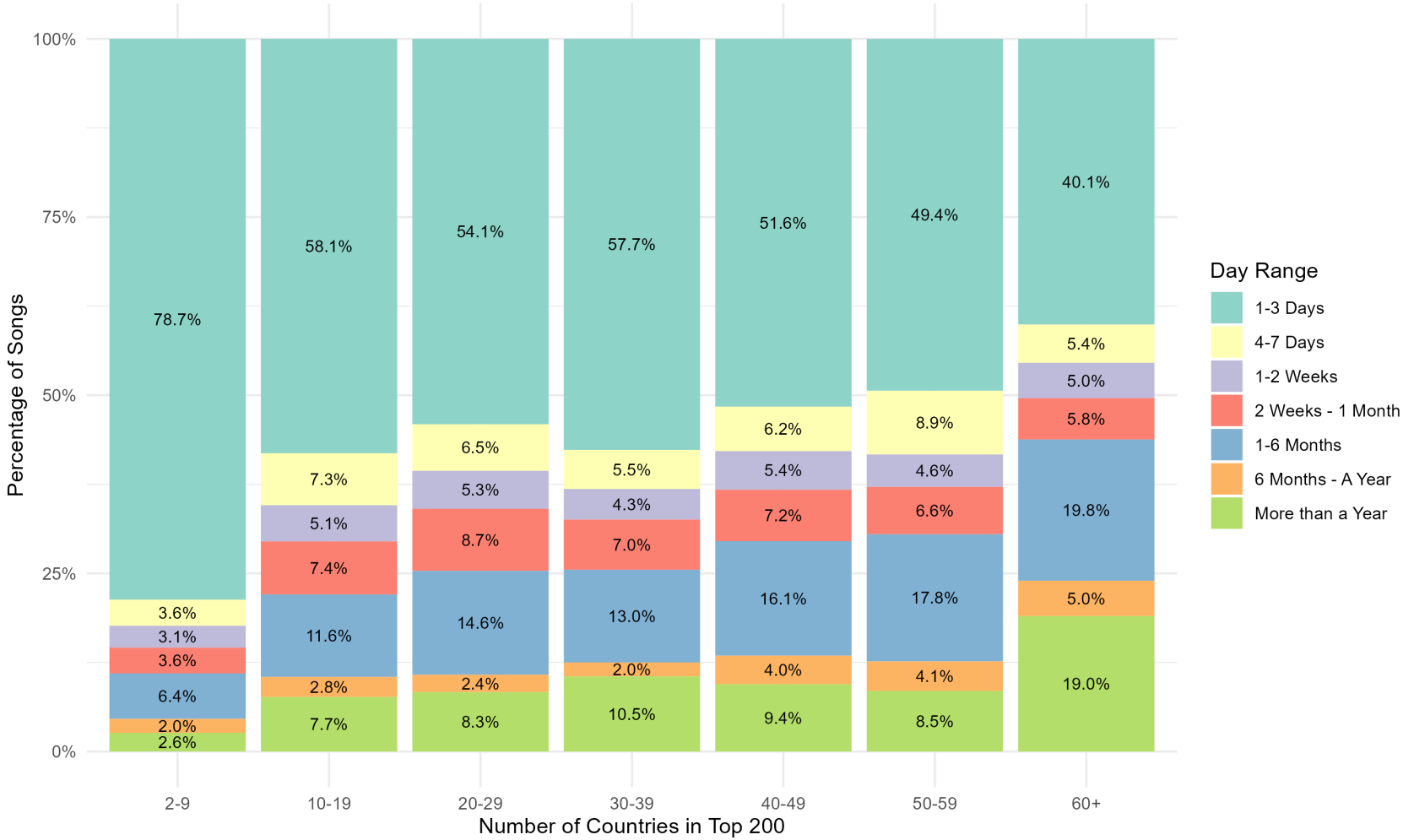
μ_{max}: maximum growth rate

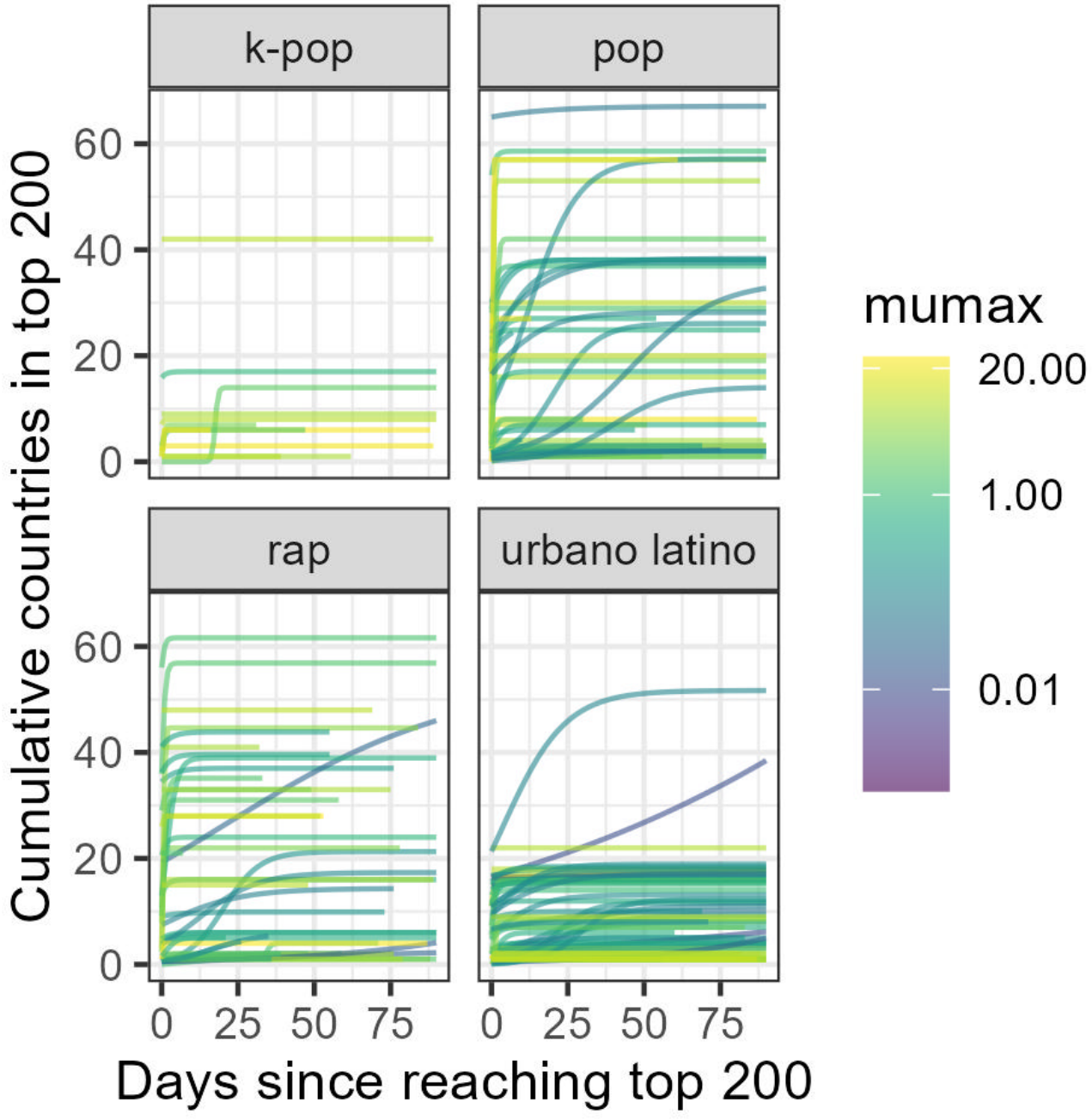
κ: number of countries reached

In progress: pooled Bayesian multilevel, non-linear model including song characteristics and temporal factors (seasonality)

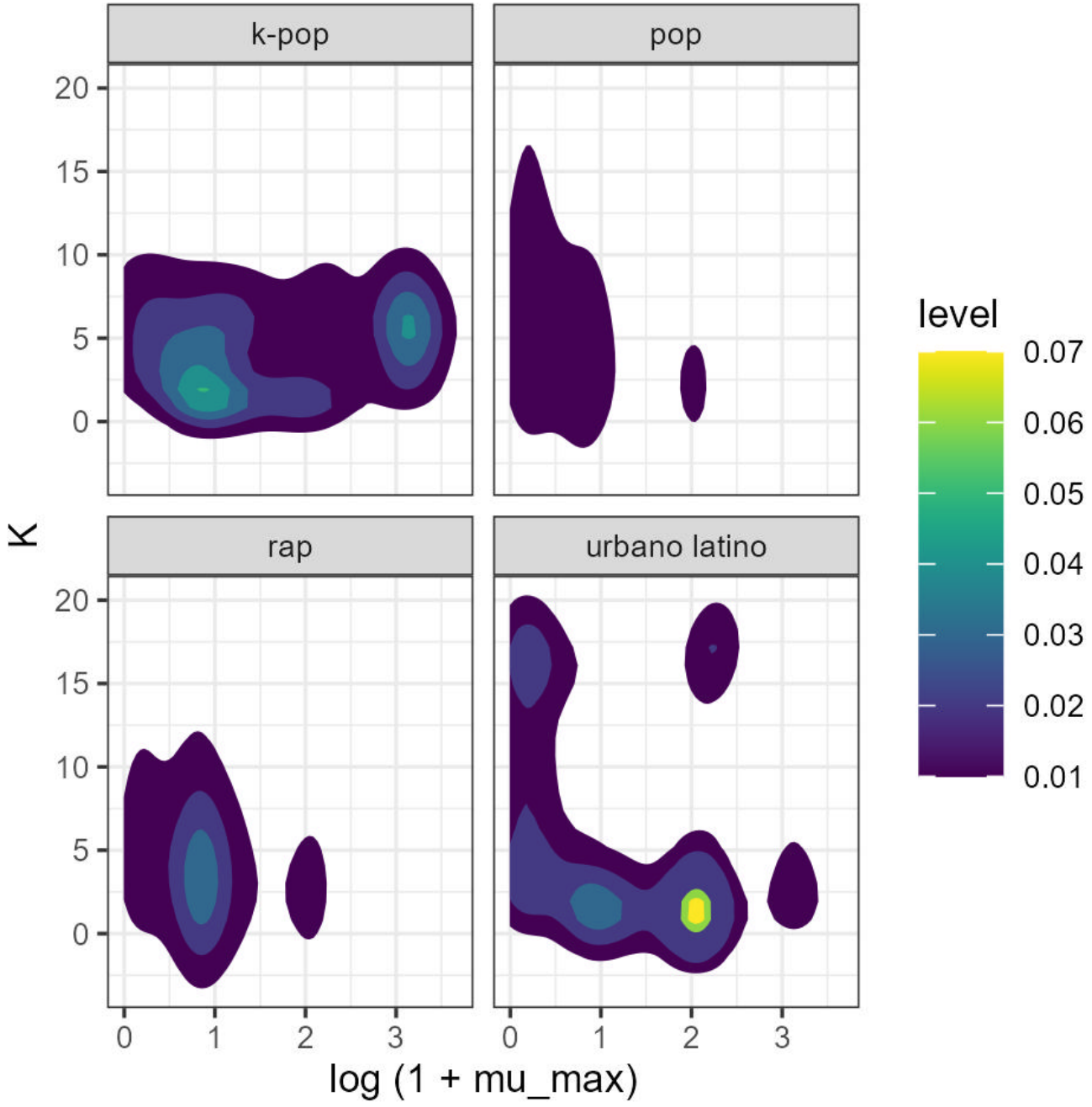

Global Diffusion of Songs on Spotify
Modelled growth trajectories for a sample of 100 songs that reached the top 100 in more than 20 coun
Billie Eilish-Your Power
THE SCOTTS, Travis Scott, Kid Cudi-THE SCOTTS
Justin Bieber-Forever (feat. Post Malone & Clever)
Lil Nas X-Old Town Road (feat. Billy Ray Cyrus) - Remix
Don Toliver-No Idea
Cardi B, Bruno Mars-Please Me
J Balvin, Bad Bunny-QUE PRETENDES
Justin Bieber-Off My Face
Kesha-Praying
XXXTENTACION-whoa (mind in awe)
Shakira, Maluma-Clandestino
Majestic, Boney M.-Rasputin
Demi Lovato-Tell Me You Love Me
Jack Harlow-Way Out (feat. Big Sean)
Pop Smoke-Something Special
Maluma-Sobrio
Growth trajectory
Faster growth
Slower growth
Plot by Aybuke Atalay and To
CC BY-NC: use with attributi
Cumulative number of countries in top 100
0
20
40
60
0
50
100
150
Days since the song reached top 100 anywhere

Time to reach maximum number of countries





Note: a sample of songs from four selected genres



Note: all songs from four selected genres

Diffusion of 'core' genres are not necessarily more simultaneous

Initial hypothesis: 'core' genres like mainstream pop are more synchronized than non-core genres, due to coordinating factors (marketing, algorithms, etc.).

If anything, non-core genres seem to spread quickly more often.

However, distribution appears bi-modal.

Across all genres, global/regional synchronization is common and internal diffusion is exception rather than rule.

Conclusions

Most music consumption is local: inconsistent with cultural homogenization model.

But the songs that do spread globally are largely North American/Western European pop, rap and rock.

- K-pop and Latin American genres are the main partial exceptions
- support for Wimmer's polycentric model is limited even though no convergence

Diffusion trajectories vary by genre, but pop/rap are not necessarily more simultaneous.

Final thoughts

Music consumption is not globally homogeneous.

However, cultural globalization is a homogenizing factor favoring core countries.

And, this process produces substantially higher returns (stream counts) for artists from these countries.

Thank you!

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