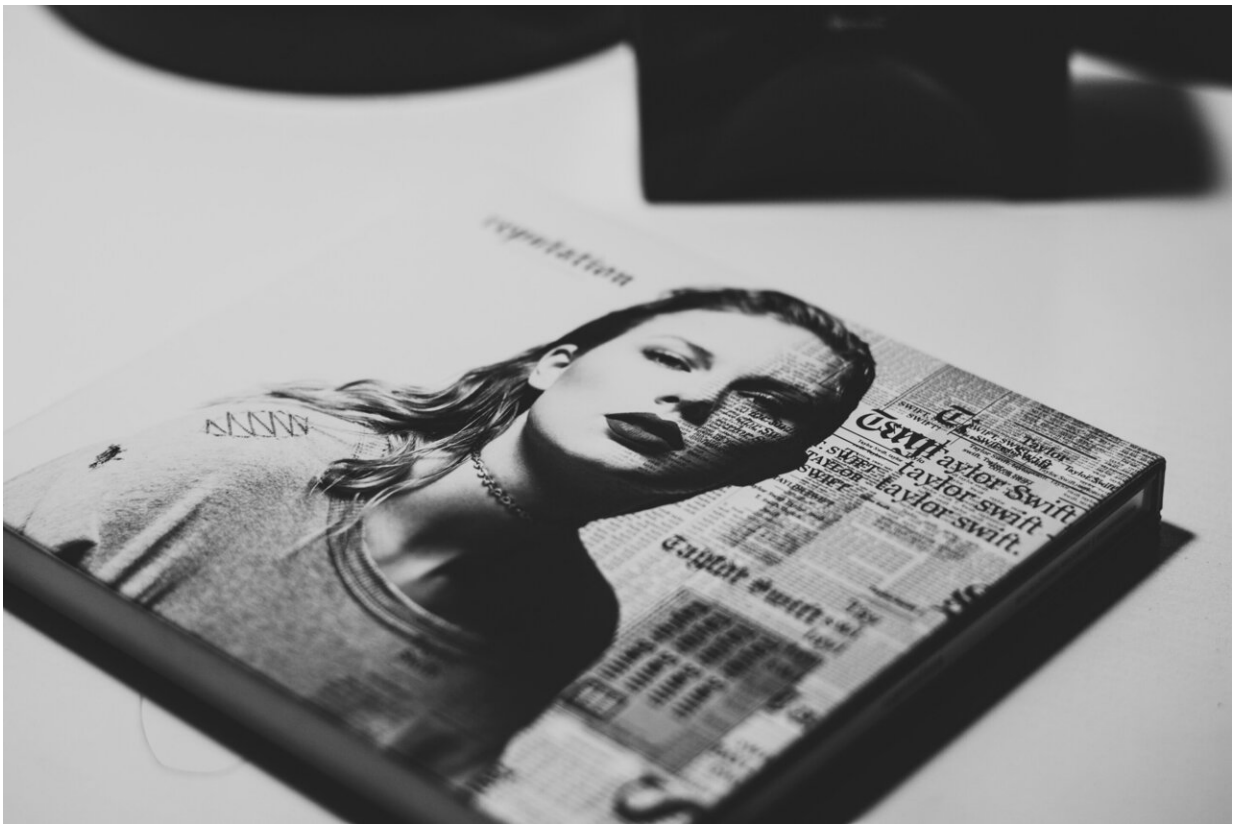
Study shows the power of social connections to predict hit songs

June 11 2024



Credit: Unsplash/CC0 Public Domain

Ever wondered how your friends shape your music taste? In a recent study, researchers at the Complexity Science Hub (CSH) demonstrated that social networks are a powerful predictor of a song's future popularity. By analyzing friendships and listening habits, they've boosted machine learning prediction precision by 50%.

"Our findings suggest that the social element is as crucial in music spread as the artist's fame or genre influence," says Niklas Reisz from CSH. By using information about listener social networks, along with common measures used in hit song prediction, such as how well-known the artist is and how popular the genre is, the researchers improved the precision of predicting hit songs from 14% to 21%. The study, published in *Scientific Reports*, underscores the power of social connections in music trends.

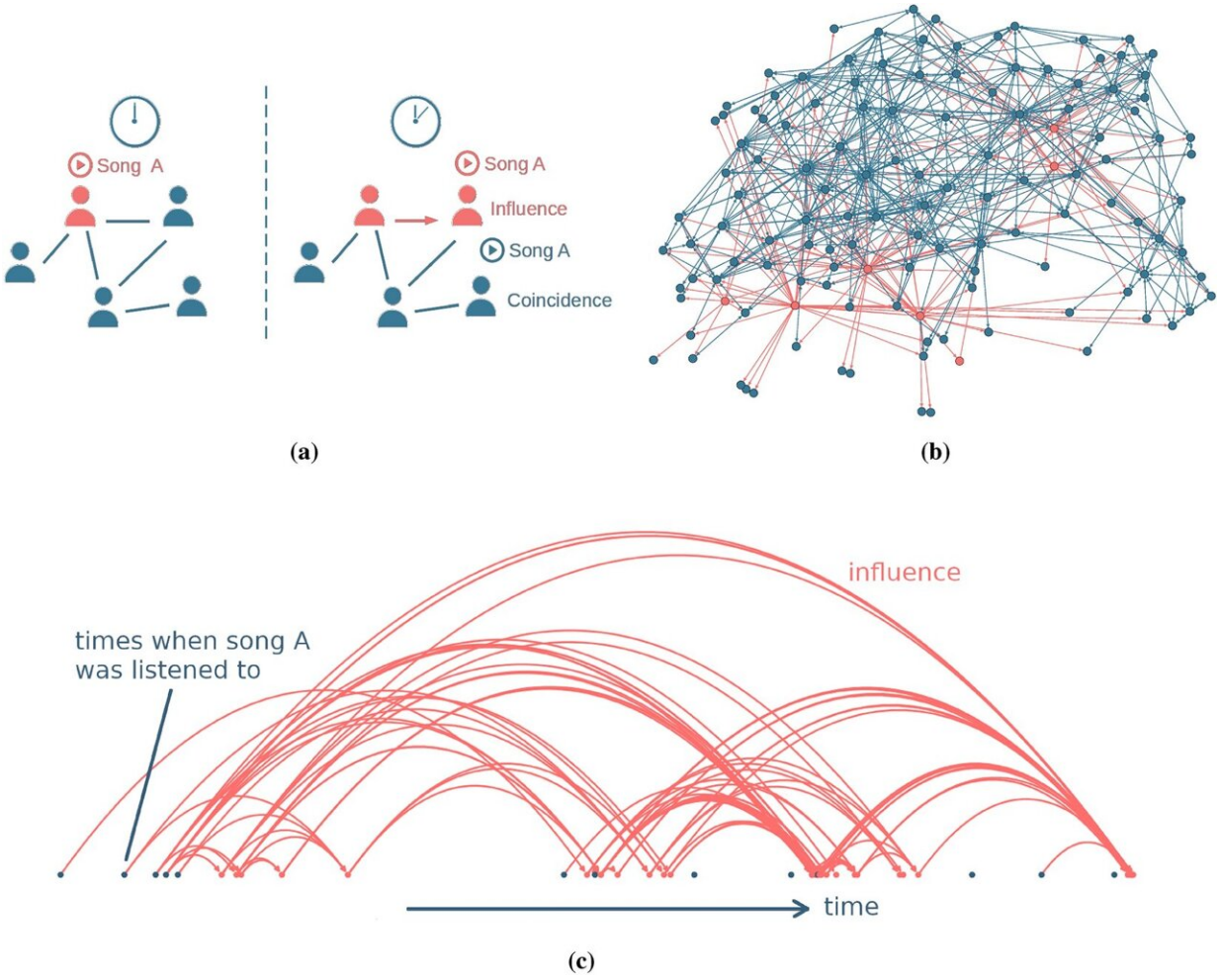
A deep dive into data

The CSH team analyzed data from the music platform last.fm, analyzing 2.7 million users, 10 million songs, and 300 million plays. With users able to friend each other and share music preferences, the researchers gained anonymized insights into who listens to what and who influences whom, according to Reisz.

For their model, the researchers worked with two networks: one mapping friendships and another capturing influence dynamics—who listens to a song and who follows suit. "Here, the nodes of the network are also people, but the connections arise when one person listens to a song and shortly afterwards another person listens to the same song for the first time," explains Stefan Thurner from CSH.

Examining the first 200 plays of a new song, they predicted its chances

of becoming a hit—defined as being in the top 1% most played songs on last.fm.



Credit: *Scientific Reports* (2024). DOI: 10.1038/s41598-024-58969-w

User influence

The study found that a song's spread hinges on user influence within their social network. Individuals with a strong influence and large,

interconnected friend circles accelerate a song's popularity. According to the study, information about social networks and the dynamics of social influence enable much more precise predictions as to whether a song will be a hit or not.

"Our results also show how influence flows both ways—people who influence their friends are also influenced by them" explains CSH researcher Vito Servedio. "In this way, multi-level cascades can develop within a very short time, in which a song can quickly reach many other people, starting with just a few people."

Social power in the music industry

Predicting hit songs is crucial for the music industry, offering a competitive edge. Existing models often focus on artist fame and listening metrics, but the CSH study highlights the overlooked social aspect—musical homophily, which is the tendency for friends to listen to similar music. "It was particularly interesting for us to see that the social aspect, musical homophily, has so far received very little attention—even though music has always had a strong social aspect," says Reisz.

The study quantifies this social influence, providing insights that extend beyond music to areas like political opinion and climate change attitudes, according to Thurner.

More information: Niklas Reisz et al, Quantifying the impact of homophily and influencer networks on song popularity prediction, *Scientific Reports* (2024). DOI: 10.1038/s41598-024-58969-w

Provided by Complexity Science Hub Vienna

Citation: Study shows the power of social connections to predict hit songs (2024, June 11) retrieved 18 June 2024 from https://phys.org/news/2024-06-power-social-songs.html

This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.