Assessing the Impact of Sampling, Remixes, and Covers on Original Song Popularity

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50 anos

Introduction

Music digitalization has introduced new forms of composition known as "musical borrowings", where composers use elements of existing songs—such as melodies, lyrics, or beats—to create new songs. These borrowings take various forms:

- **Sampling:** Incorporating fragments from pre-existing songs to produce innovative creations.
- **Remixes:** Altering a song's structure, rhythm, or effects to attract new audiences.
- **Covers:** Re-recording original songs, often providing fresh interpretations or even surpassing the original in popularity.

Musical borrowings raise important **copyright** and **fair use** questions, particularly regarding their market impact. While some studies suggest sampling boosts the popularity of original songs, the dynamics remain complex. Using data from WhoSampled and Google Trends, we investigate: **How does the popularity of a borrowing song influence the relevance and success of the original?**

Methodology

To investigate the impact of *musical borrowings* on original song popularity, we analyzed a dataset of borrowee (the one who borrowed) and borrowed (the sampled) songs using quantitative techniques. Our approach can be summarized as follows:
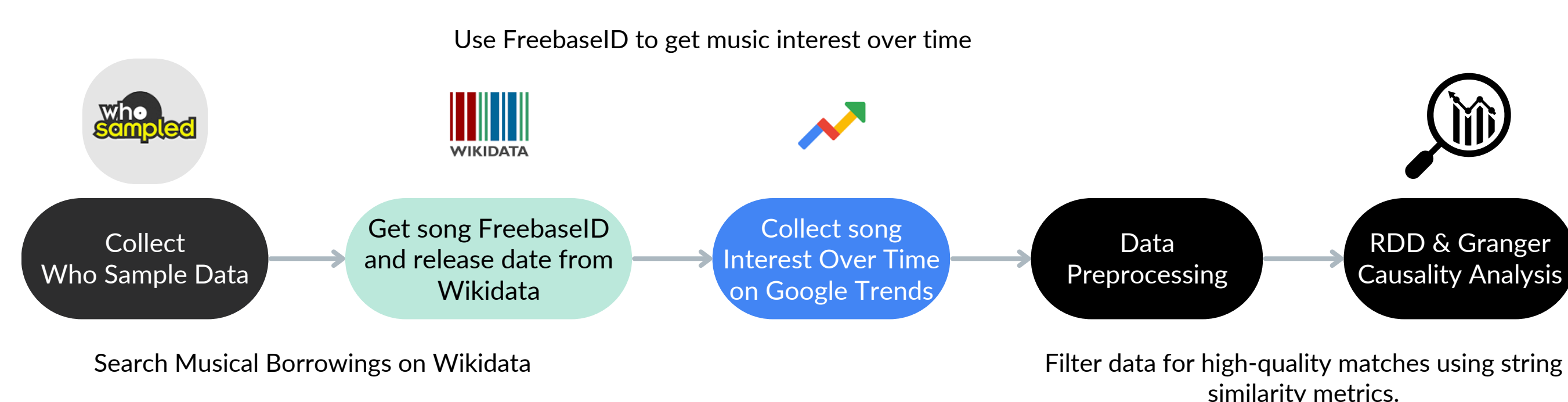
Data Collection: Our dataset is available at: `github.com/uai-ufmg/whosampleddata`

1. **WhoSampled:** Initial dataset of 700,000 songs, including samples, covers, and remixes. Supplemented with Wikidata and Google Trends data.
2. **Wikidata:** Matched 44,857 songs using FreebaseID to retrieve release dates and Google Trends links.
3. **Filtering:** Refined to 25,830 songs using string similarity metrics for high-quality matches.
4. **Google Trends:** Collected Search Interest Over Time data (monthly since 2004) for 4,360 songs.
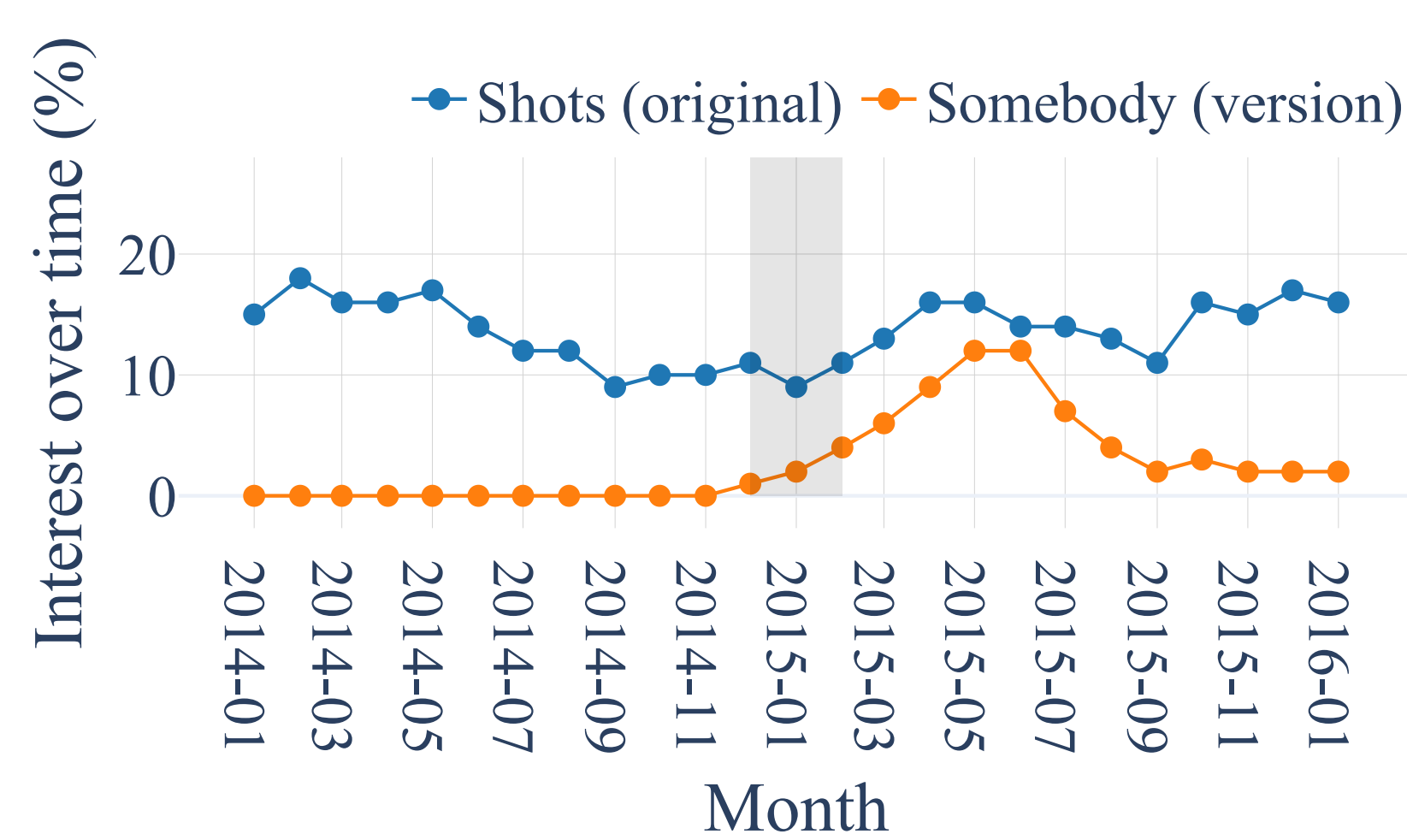

Figure 1. Example of Search Interest Over Time for "Shots" (LMFAO) and "Somebody" (Natalie La Rose). The release month is the shaded region.

Data Preprocessing:

- Excluded songs with zero search interest during the analysis period.
- Filtered time series to 24 points (12 before and 12 after release) to mitigate the impact of multiple events and seasonal effects.
- Retained 884 borrowings with statistically significant results ($p < 0.05$).

Estimating the Effect of Musical Borrowings on Interest in a Song:

- **Short-term Impact:** We applied Regression Discontinuity Design (RDD) to assess the immediate impact of musical borrowings on the original song's popularity. By comparing search interest before and after the borrowing's release, we estimated the causal effect of the sample. The impact of a musical borrowing was assessed using the following model:

$$googletrends(t) \sim 1 + t + \mathbb{I}_{t>0} + t \cdot \mathbb{I}_{t>0}$$

where t is the time variable, with $t = 0$ at the borrowing release. $\mathbb{I}_{t>0}$ is an indicator function that captures the change in search interest, and the coefficient on $t \cdot \mathbb{I}_{t>0}$ represents the Average Treatment Effect (ATE), showing the causal impact of the release.

- **Long-term Impact:** Granger causality tests if past values of one time series help predict another. We applied the test with a maximum lag of 10 months, capturing causal relationships over extended periods. A low p-value (< 0.05) indicates significant predictive information.

Results

Our findings indicate some causal relationships between musical borrowings and the popularity of *borrowed* songs, though effects vary in strength. Both short-term and long-term impacts were observed, highlighting the dynamics of *musical borrowings* in shaping audience interest.

Short-Term Impact (RDD):

- Among 884 borrowings analyzed, 82 (9.3%) showed statistically significant short-term effects (p < 0.05).
- Outliers included cases like Flo Rida's *"Good Feeling"*, sampling Etta James' *"Something's Got a Hold on Me"*, where search interest surged due to no prior activity.
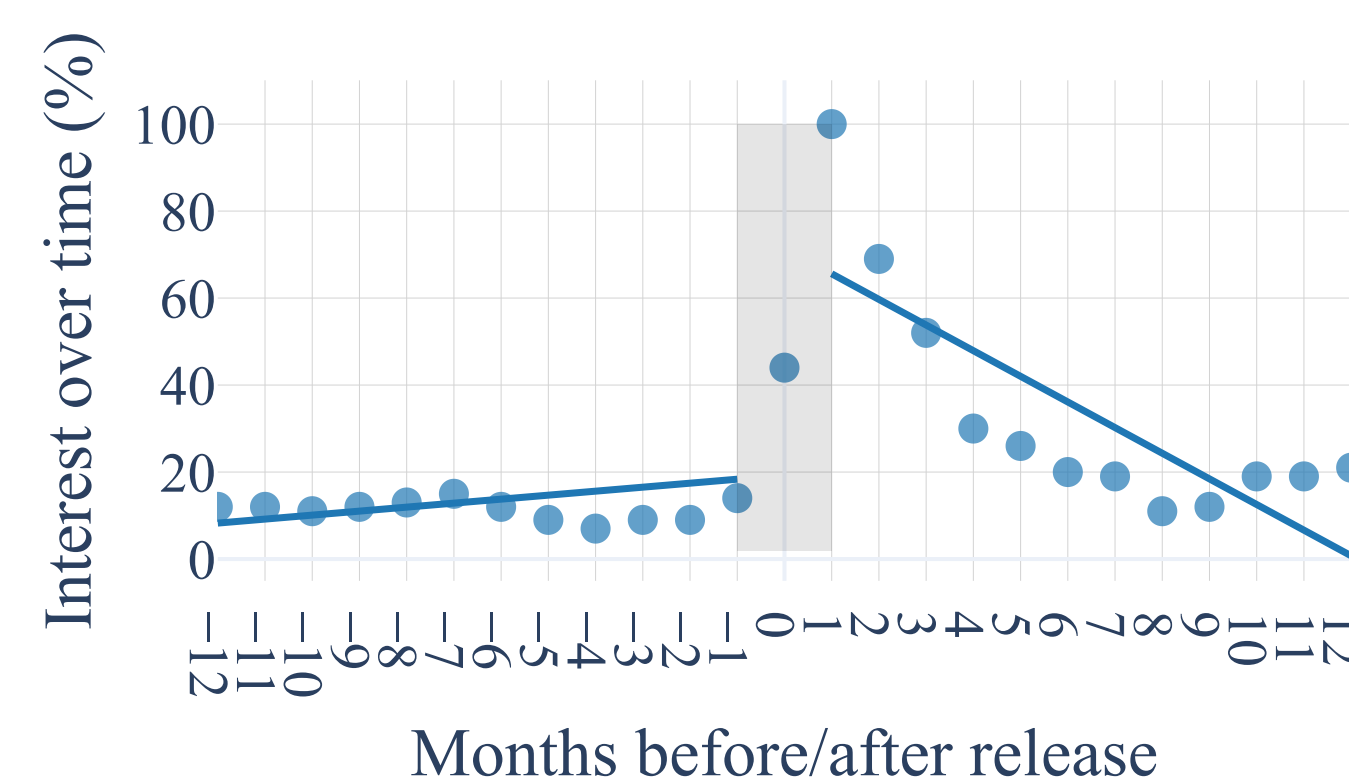

Figure 2. "You Spin Me Round (Like a Record)" (Dead or Alive, 1984) borrowed by "Right Round" (Flo'Rida, 2009)
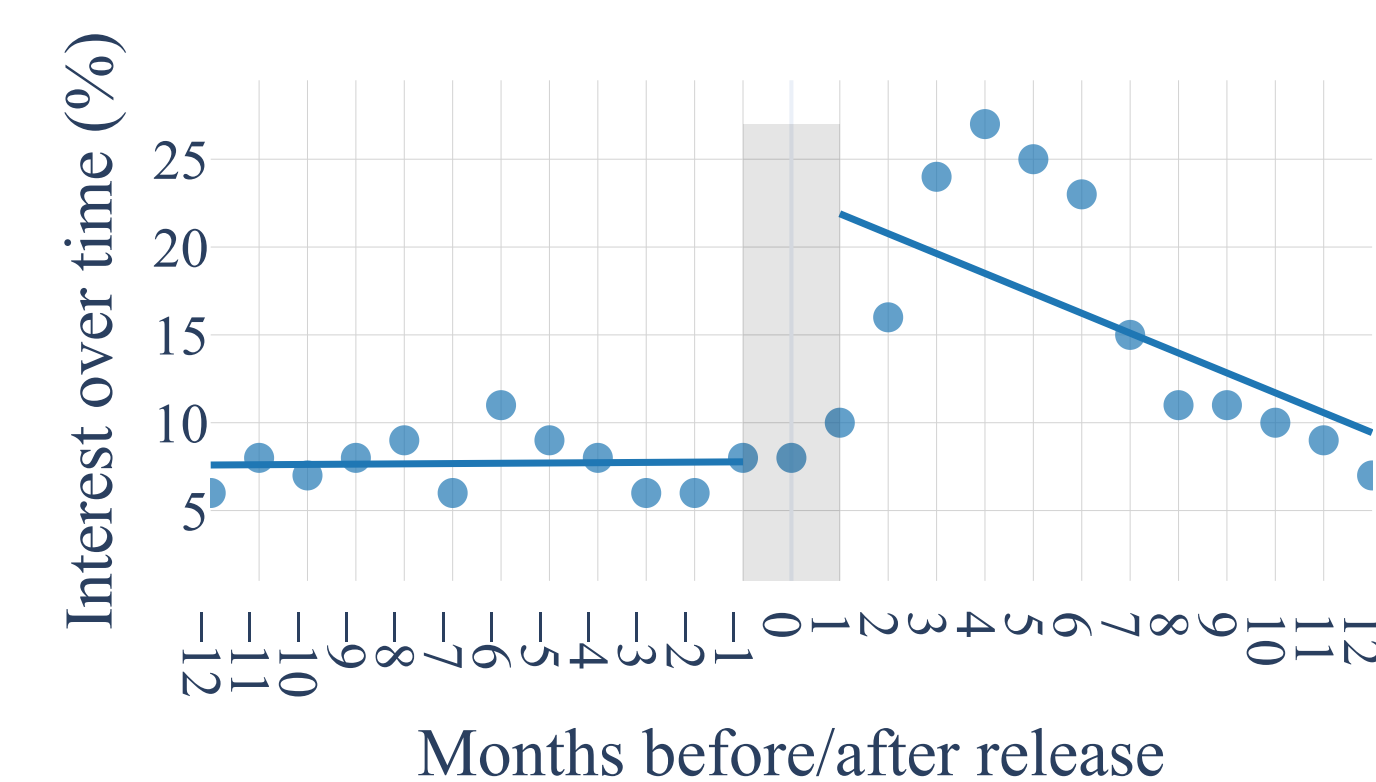

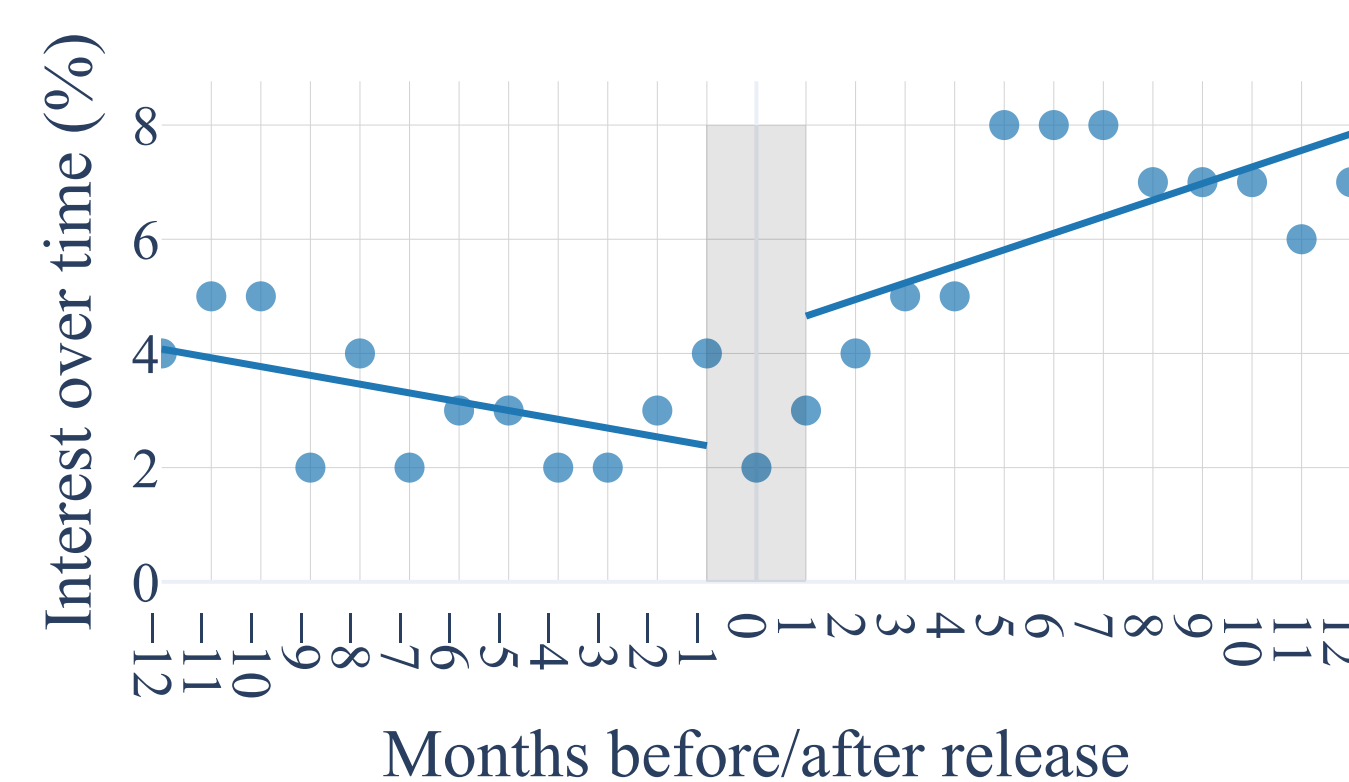Figure 3. "Werewolves of London" (Warren Zevon, 1978) borrowed by All Summer Long (Kid Rock, 2007)

Figure 4. "It Takes Two" (Rob Base DJ E-Z Rock, 1988) borrowed by "Peaches N Cream (Snoop Dogg song)" (Snoop Dogg, 2015)
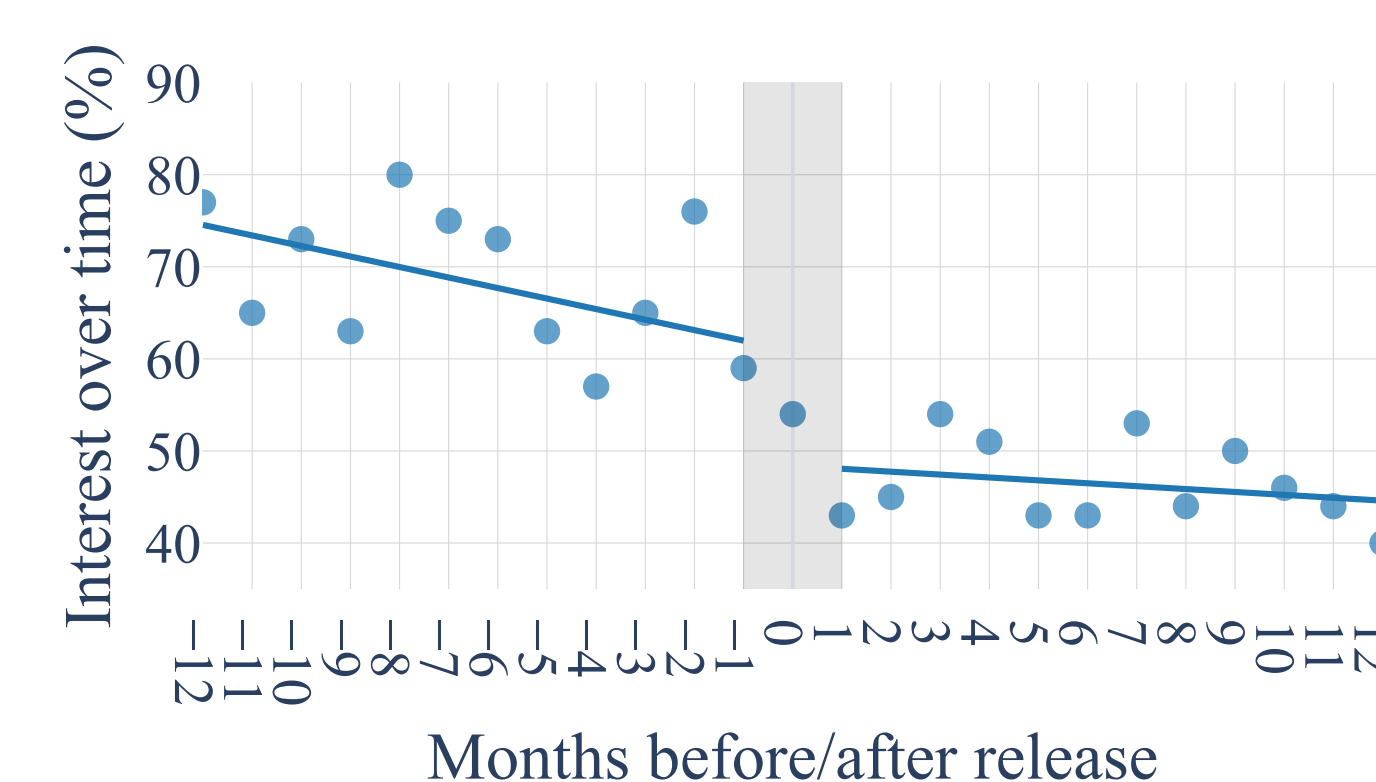

Figure 5. "Stronger" (Britney Spears, 2000) borrowed by the song "Pound the Alarm" (Nicki Minaj, 2012)

Long-Term Impact (Granger Causality):

- 117 borrowings (64% of significant cases) demonstrated predictive relationships between borrowee and borrowed songs over extended periods.
- Example: Covers and remixes often sustained interest in original songs beyond the borrowee's release period.

General Observations:

- Borrowee songs can revive interest in older tracks, especially those from the 1970s–1980s.
- In some cases, negative impacts on the borrowed song's popularity were observed, potentially due to marketing overlaps or stylistic similarities.

Conclusions and discussion

This work estimated causal evidence that musical borrowings impact the popularity of *borrowed* songs. Our motivation was delving deeper into the argument that borrowing (samples, remixes, and covers) increases the popularity of *borrowed* songs.

Conclusions:

- Borrowings can boost older songs' popularity, with short-term spikes in 9.3% and long-term impacts in 64% of cases.
- Positive effects dominate, but competition or redundancy can lead to negative outcomes.

Discussion:

- Borrowing effects vary by genre, release timing, and marketing.
- Web search interest may not fully reflect popularity; broader datasets are needed.

In summary, our findings reveal the diverse impacts of *musical borrowings*, offering valuable insights for the music industry and copyright policy. Future work should expand datasets and explore broader platforms to deepen these findings.

Acknowledgments