



## Abstract

This research examines how music recommendation algorithms on streaming platforms influence the visibility of Black artists across genres. Using data collected from Spotify's editorial and algorithmic playlists, this study reveals significant disparities in representation, particularly in algorithmic recommendations and outside traditionally "Black" genres. Findings suggest algorithms may be reinforcing historical patterns of genre confinement in digital spaces, creating new barriers to cross-genre exposure for Black musicians despite their foundational contributions to American music.

## Introduction

- Streaming platforms have replaced traditional gatekeepers as primary channels for music discovery
- Algorithms now determine which artists receive visibility and recommendation
- Recommendation systems operate with limited transparency
- These systems potentially encode and amplify historical biases through machine learning
- Spotify has over 400 million users worldwide, making algorithmic fairness a significant issue for artist exposure
- Cross-genre visibility impacts artist revenue streams, audience development, and creative freedom
- Understanding algorithmic bias is crucial for developing more equitable music platforms

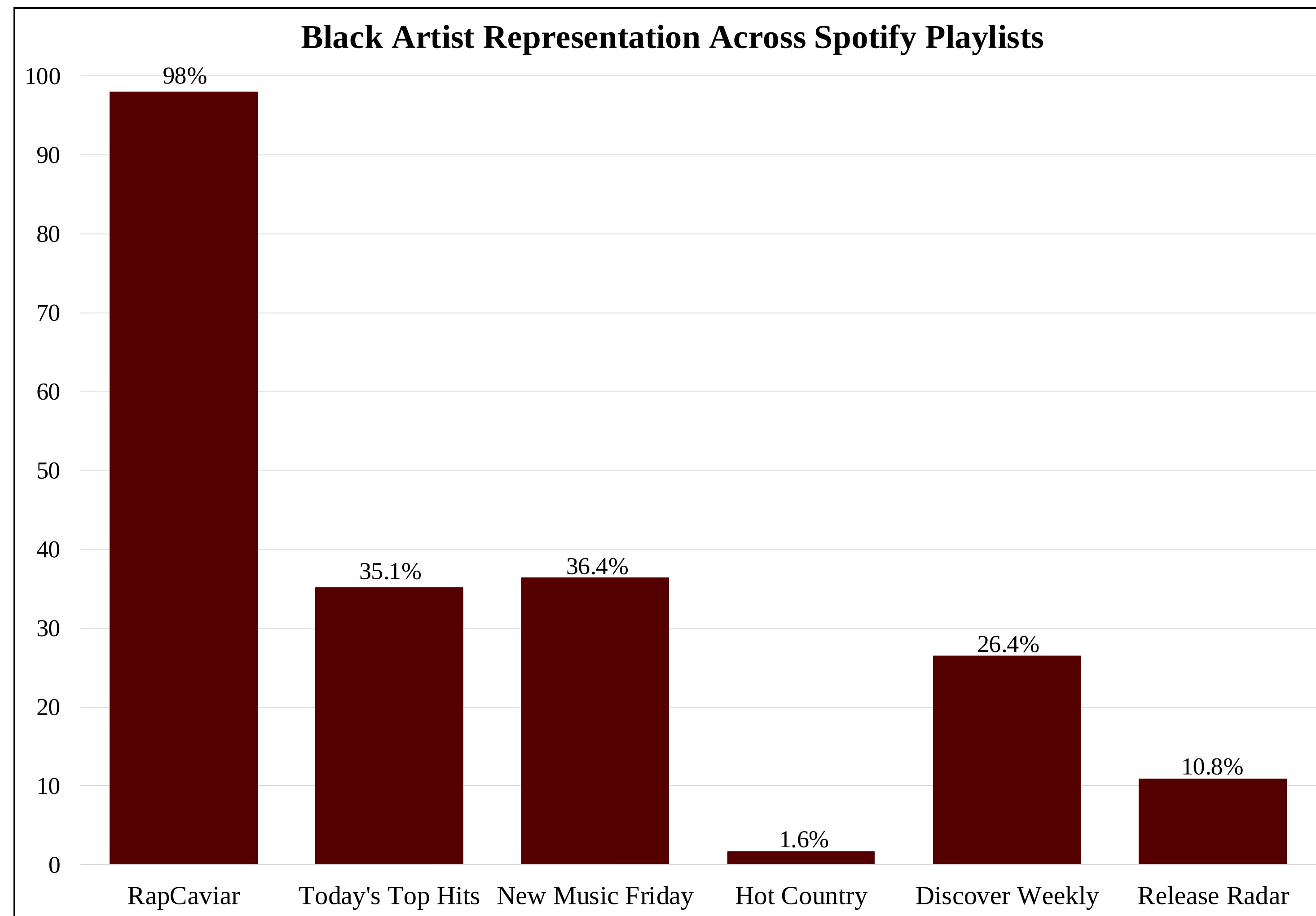
## Research Questions

- Do Spotify's algorithms favor non-Black artists in mainstream playlists?
- Are Black artists restricted to genre-specific playlists rather than gaining cross-genre exposure?
- What statistical disparities exist between algorithmic and editorial playlist curation?
- How can fairness-aware AI solutions improve representation for Black musicians?

## Methodology

- Selected 6 diverse Spotify playlists representing different curation methods and genres
- Chosen to represent both algorithmic and editorial curation processes
- Included genre-specific and genre-agnostic playlists
- Manual identification of artist demographics based on publicly available information
- Comparative analysis between algorithmic and editorial playlists
- Statistical parity measurement to quantify representation fairness
- Genre distribution analysis to identify patterns of confinement
- Data collected during March 2025 covering 335 total artists

| Playlist                | Black Artists | Total Artists | Percentage |
|-------------------------|---------------|---------------|------------|
| <i>Rap Caviar</i>       | 49            | 50            | 98%        |
| <i>Today's Top Hits</i> | 20            | 57            | 35.1%      |
| <i>New Music Friday</i> | 28            | 77            | 36.4%      |
| <i>Hot Country</i>      | 1             | 61            | 1.6%       |
| <i>Discover Weekly</i>  | 14            | 53            | 26.4%      |
| <i>Release Radar</i>    | 4             | 37            | 10.8%      |



## Statistical Analysis

### Algorithmic vs. Editorial Comparison:

- Editorial playlists (*Rap Caviar*, *Today's Top Hits*, *New Music Friday*): 35.8% average Black representation
- Algorithmic playlists (*Discover Weekly*, *Release Radar*): 18.6% average Black representation
- Representation gap: 17.2 percentage points (48% reduction)
- Black artists systematically underrepresented in algorithmic recommendations

### Genre Confinement Patterns:

- 98% of artists in hip-hop playlist are Black
- Only 1.6% of artists in country playlist are Black
- 60.7-fold disparity in representation between genres
- Clear pattern of genre segregation that mirrors historical industry practices

## Genre Confinement

- Near-total absence of Black artists in country music (1.6%) despite historical contributions
- Black artists predominantly restricted to hip-hop/R&B categories
- Algorithmic playlists show less cross-genre representation than editorial playlists
- Digital perpetuation of historical industry genre segregation
- Limited cross-genre visibility restricts audience development
- Reinforcement of traditional industry barriers in digital spaces
- Creative constraints when algorithms favor genre conformity

## Algorithmic Bias Mechanisms

- Collaborative Filtering: Recommendations based on similar users' preferences. Artists with smaller audiences face disadvantages
- Content-Based Filtering: Audio feature extraction and analysis (tempo, timbre, vocal characteristics). Vector space representation of songs as feature vectors. Similarity calculated using distance metrics (cosine similarity)
- Feedback Loops: User engagement reinforces algorithm preferences. Limited initial exposure leads to reduced engagement and fewer recommendation which creates a cycle of algorithmic invisibility

## Technical Solutions

### Fairness-Aware Machine Learning:

- Reweight training data to address historical biases
- Multi-objective recommendation systems beyond engagement metrics
- Implementing diversity constraints in algorithmic optimization
- Feature engineering to reduce cultural bias in content filtering

### Platform-Level Interventions:

- Diverse curation teams overseeing algorithmic systems
- User controls for increasing recommendation diversity
- Regular algorithmic audits and bias testing

## Conclusion

- Spotify's recommendation algorithms show significant bias patterns
- The data reveals both algorithmic bias and genre confinement effects
- Black artists face limited visibility outside traditionally "Black" genres
- Algorithmic solutions combined with human oversight needed
- Equitable representation requires intentional system design
- This research highlights the need for transparency in how algorithms shape cultural exposure

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