### **Policy Memo: Enhancing Engagement on Music Streaming Platforms**

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#### **Executive Summary**

This study examines user engagement on a music streaming platform, analyzing how demographic and behavioral variables such as age, gender, and listening habits influence activity. Using robust statistical methods—including regression analysis, clustering, and propensity score matching—we uncovered key factors driving engagement. These insights form the basis for strategic recommendations to enhance user retention, optimize content delivery, and drive engagement.

**1. Research Question**:  
What demographic and behavioral factors most influence user engagement, and how can these insights inform effective platform strategies?

**2. Hypotheses**:

1. Exploratory behavior significantly increases user engagement, while mainstream preferences negatively impact it.
2. Age and gender mediate engagement, with younger users and males demonstrating higher activity.
3. High-playcount users exhibit stronger exploratory tendencies, representing a unique opportunity for tailored strategies.

**3. Empirical Model**



**4. Key Findings**:

* **Exploratory behavior** drives engagement (+6.9 tracks/month), while **mainstream preferences** negatively correlate with activity (-11.9 tracks/month).
* **Male users** listen to 107 more tracks monthly than females, highlighting a gender gap in engagement.
* **Younger users (<30)** dominate activity, but preferences evolve with age, with older users (>45) favoring niche content.
* **High-playcount users** demonstrate distinct exploratory tendencies, offering a clear opportunity for personalized strategies.

#### **Policy Recommendations**

**1. Personalization Strategies for Active Engagement  
Insight:** Exploratory behavior significantly increases engagement, while mainstream preferences reduce activity.  
**Policy:** Develop recommendation algorithms that prioritize exploratory content for high-playcount users.

**Implementation:**

* Introduce an "Explore Mode" to feature niche or non-mainstream music.
* Use clustering to group users by exploratory tendencies, delivering tailored recommendations.

**2. Age-Specific Content Strategies  
Insight:** Younger users (<30) prefer mainstream music, while older users (>45) favor niche content. Engagement declines significantly with age (-85.6 tracks/month for seniors).  
**Policy:** Create age-adaptive interfaces and content strategies to retain diverse user groups.

**Implementation:**

* Emphasize niche content for older users through personalized homepages.
* Promote peer-driven playlists and community-building features for younger users.

**3. Gender-Sensitive Engagement Campaigns  
Insight:** Male users engage more (+107 tracks/month), yet gender has minimal impact on variability in exploratoryness.  
**Policy:** Launch inclusive campaigns to close the gender gap in engagement.

**Implementation:**

* Highlight female artists and diverse content through curated playlists.
* Introduce "For Her" initiatives, featuring playlists and stories tailored for female audiences.

**4. Regional Optimization  
Insight:** Western countries dominate platform usage, with the U.S. leading.  
**Policy:** Expand localized campaigns in high-density regions while targeting emerging markets.

**Implementation:**

* Launch campaigns tailored to high-density regions like the U.S. and Germany.
* Collaborate with local artists in underserved markets to drive user growth.

**5. Content Diversification to Boost Engagement  
Insight:** Users with niche preferences exhibit higher engagement, emphasizing the value of diverse content.  
**Policy:** Invest in expanding underrepresented genres and niche music libraries.

**Implementation:**

* Build recommendation systems spotlighting underrepresented genres.
* Partner with independent artists to introduce exclusive content.

#### **Conclusion and Next Steps**

This study highlights the importance of understanding demographic and behavioral drivers of user engagement. By implementing the proposed policies, the platform can retain its most active users while addressing gaps in underrepresented groups.

**Limitations:**

* **Data Constraints**: The MLHD dataset focuses on Western countries (e.g., U.S., U.K., Germany), and the lack of timestamped data restricts analyses of temporal patterns like seasonal or daily behavior trends.
* **Model Limitations**: The regression model explains a small share of engagement variance (R² = 0.020), highlighting missing variables like subscription type and device usage, while interaction terms may introduce multicollinearity.
* **Behavioral Complexity**: User engagement is influenced by factors like mood and external trends, which are dynamic and not captured in the current dataset.

**Actionable Steps:**

* Integrate findings into the platform’s recommendation system to personalize user experiences.
* Design and test targeted campaigns tailored to specific user demographics.
* Monitor engagement metrics post-implementation to evaluate success and refine strategies.

**Future Research**:

Further exploration of subscription types, device usage, and temporal patterns can enhance understanding of engagement drivers and improve policy implementation.