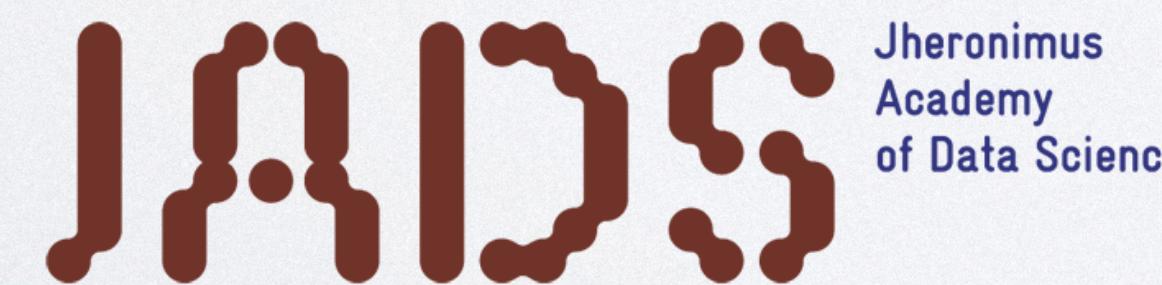


# Exploring the longitudinal effects of nudging on users' music genre exploration behavior and listening preferences

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Martijn Willemsen



# Background

What is nudge?

- A concept of decision making
- Influence the behavior of individuals by changing decision information, structure and providing decision assistance of individuals...

Nudge in Recsys

- Reordering the recommendation list

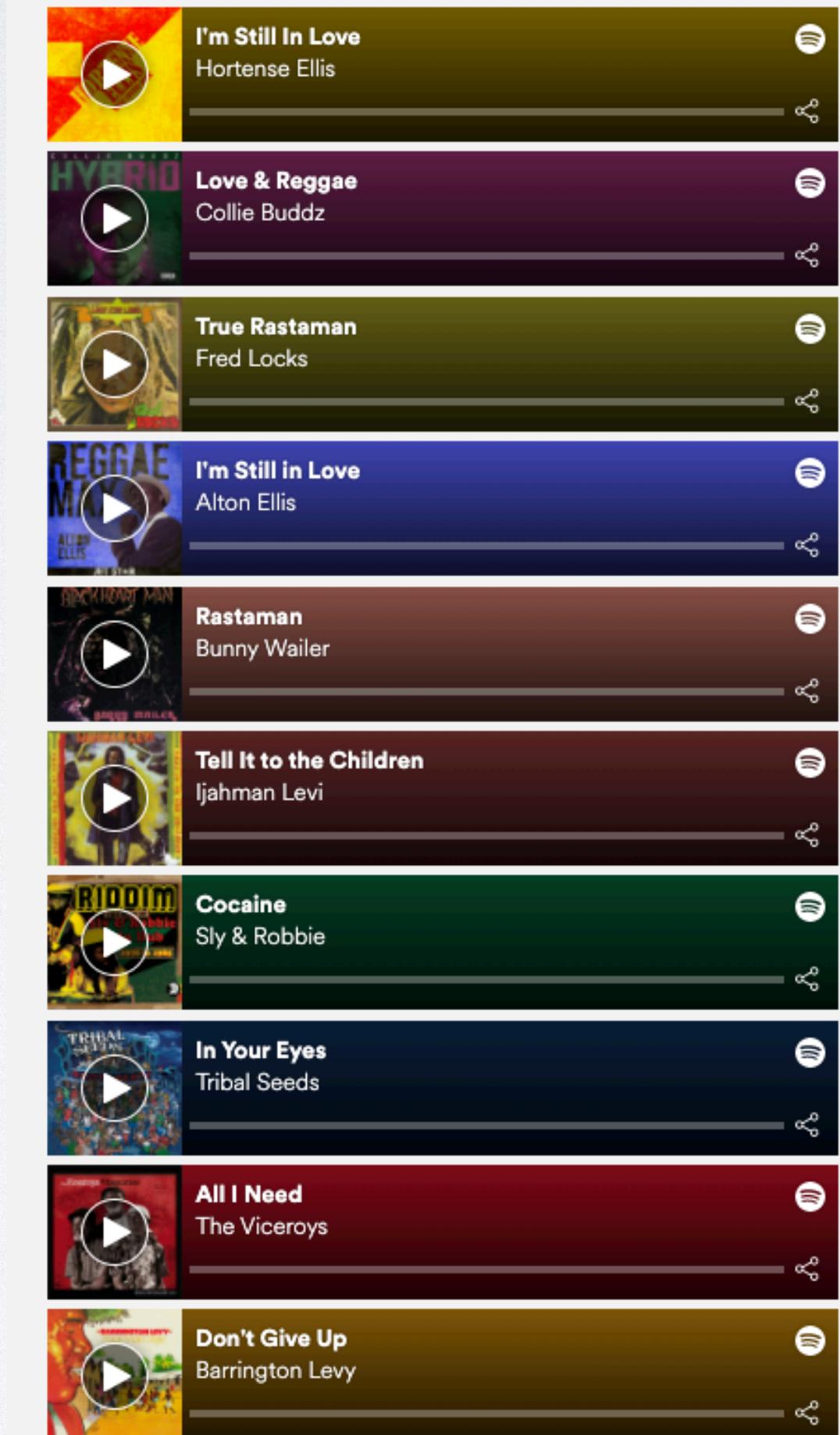
Nudge in exploration

- Visual nudges on blind spots [Tintarev et al., 2018]
- To explore new music genres

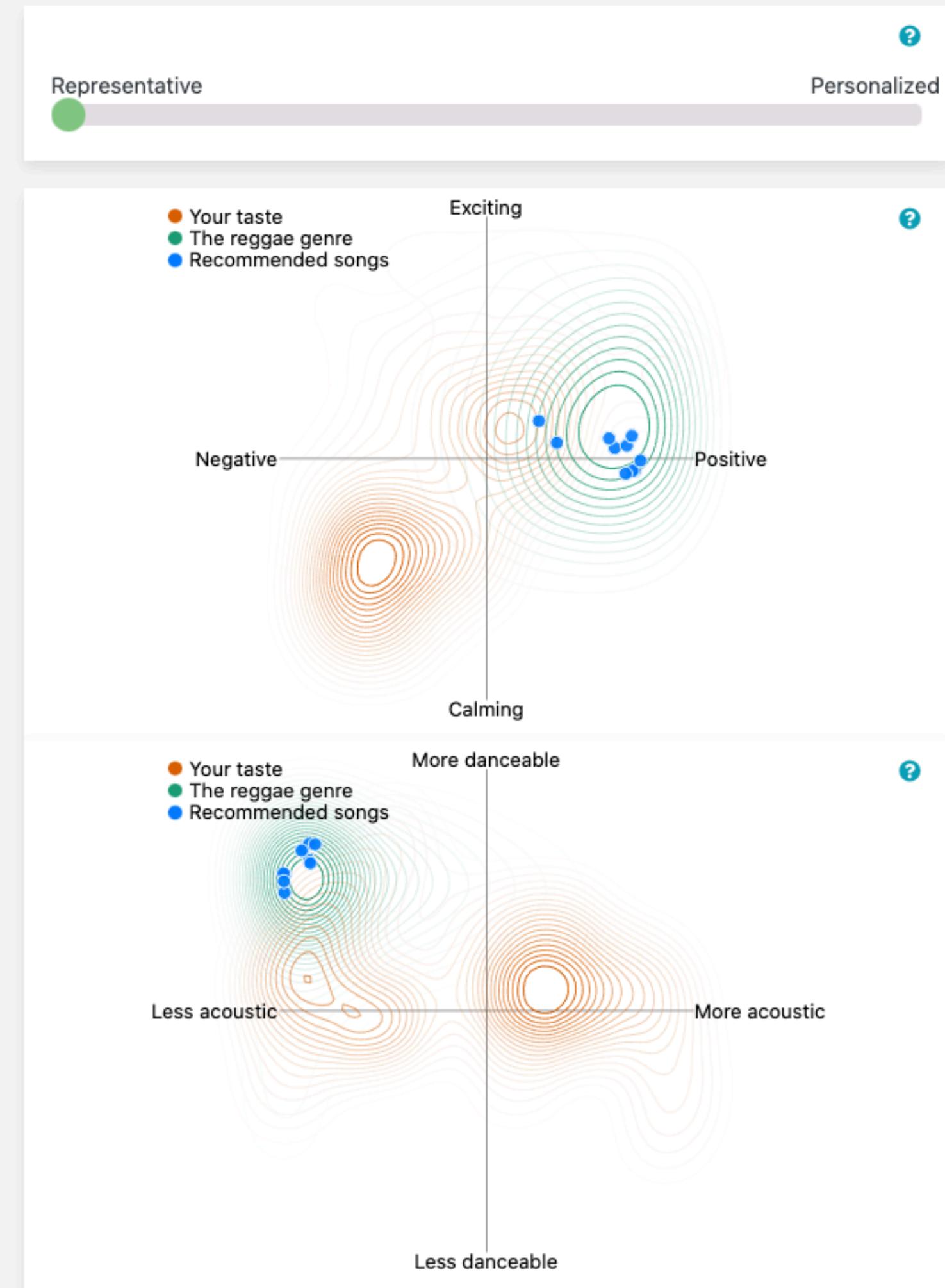
# Nudges in music genre exploration

Slider to control the recommendations with different personalization level (0.0 - 1.0)

- Representative position (genre-typical tracks)
- Personalized position



Save playlist to my Spotify



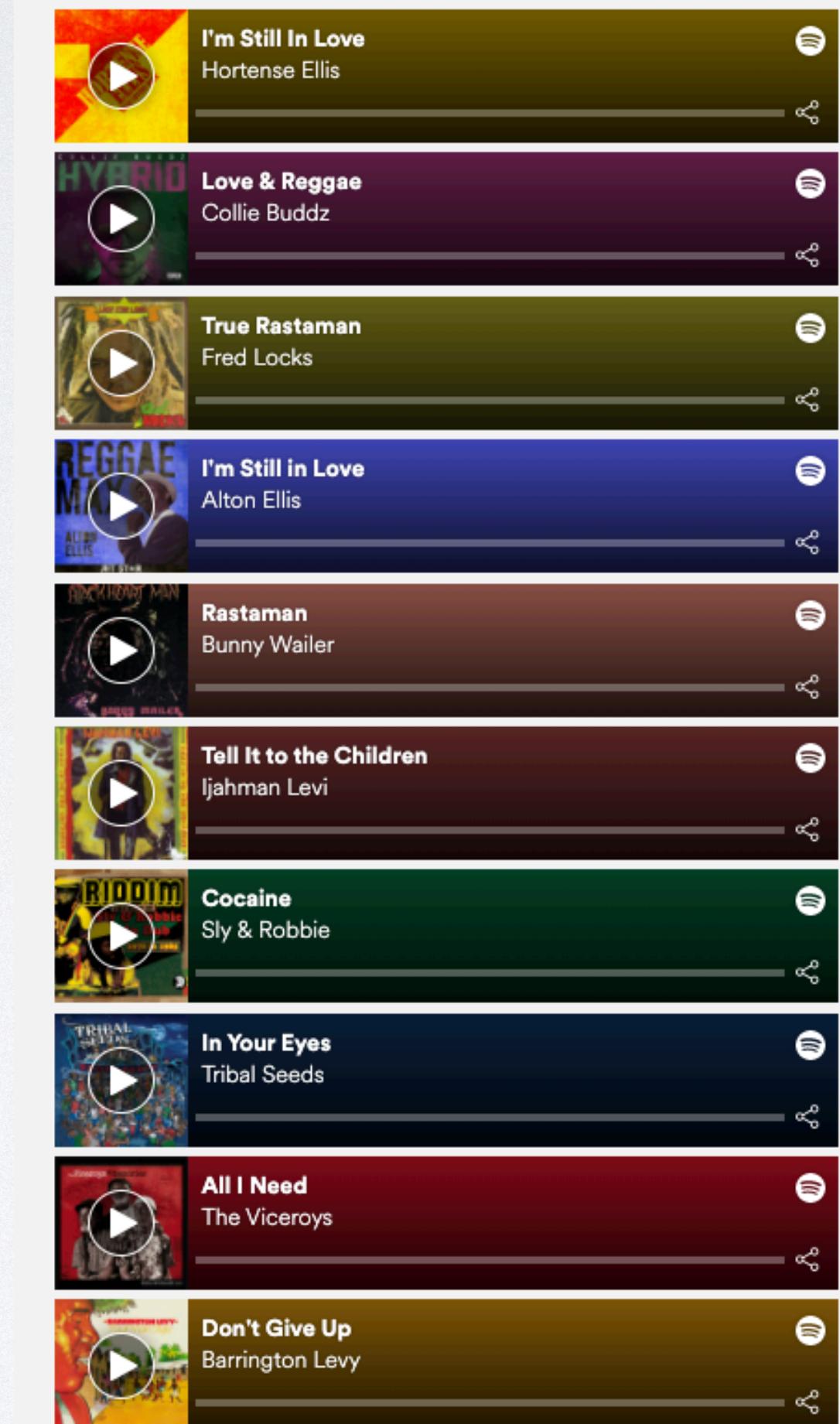
Continue to survey →

# Nudges in music genre exploration

Representative

Slider to control the recommendations with different personalization level (0.0 - 1.0)

- Representative position (genre-typical tracks)
- Personalized position



Save playlist to my Spotify



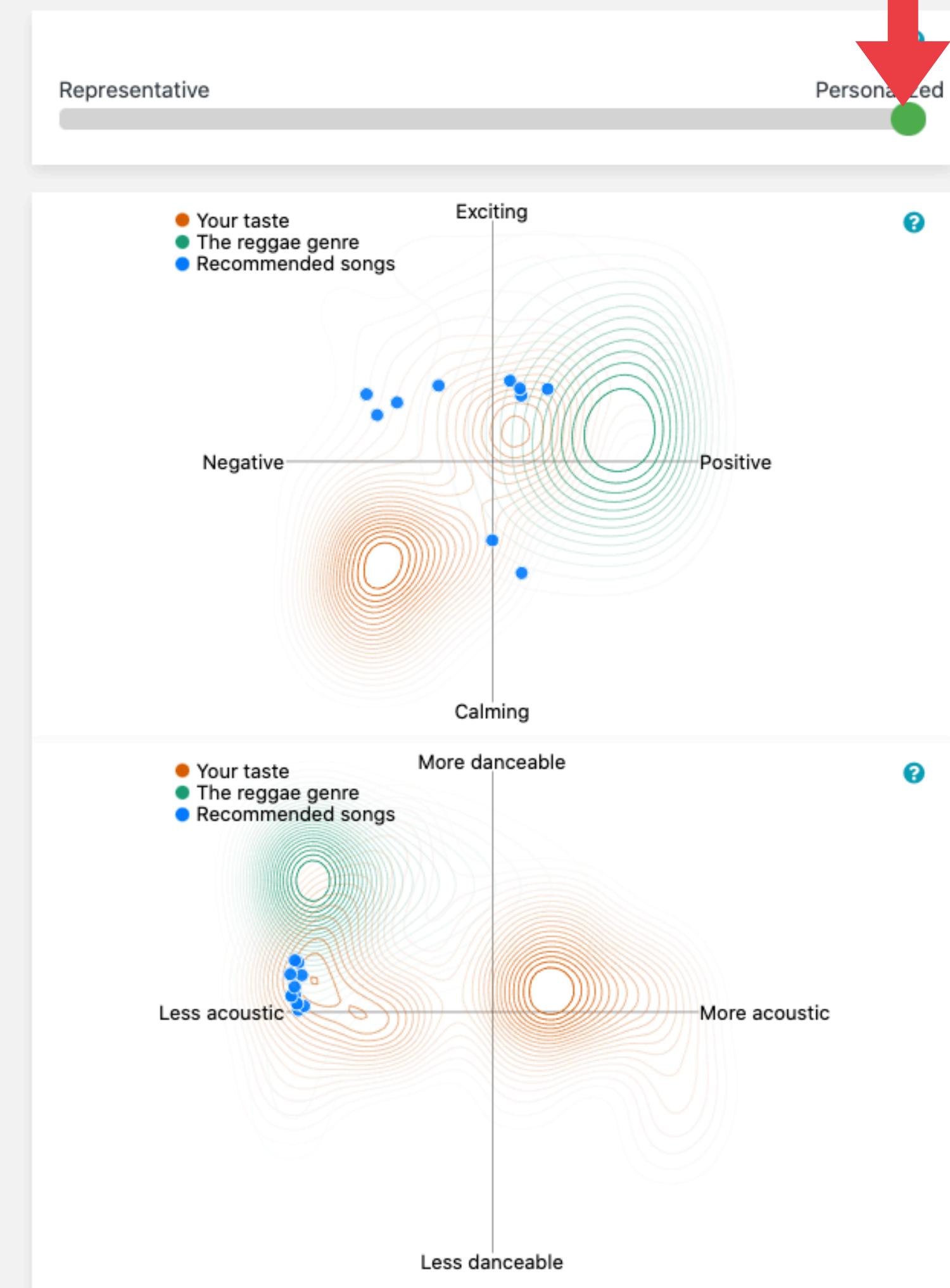
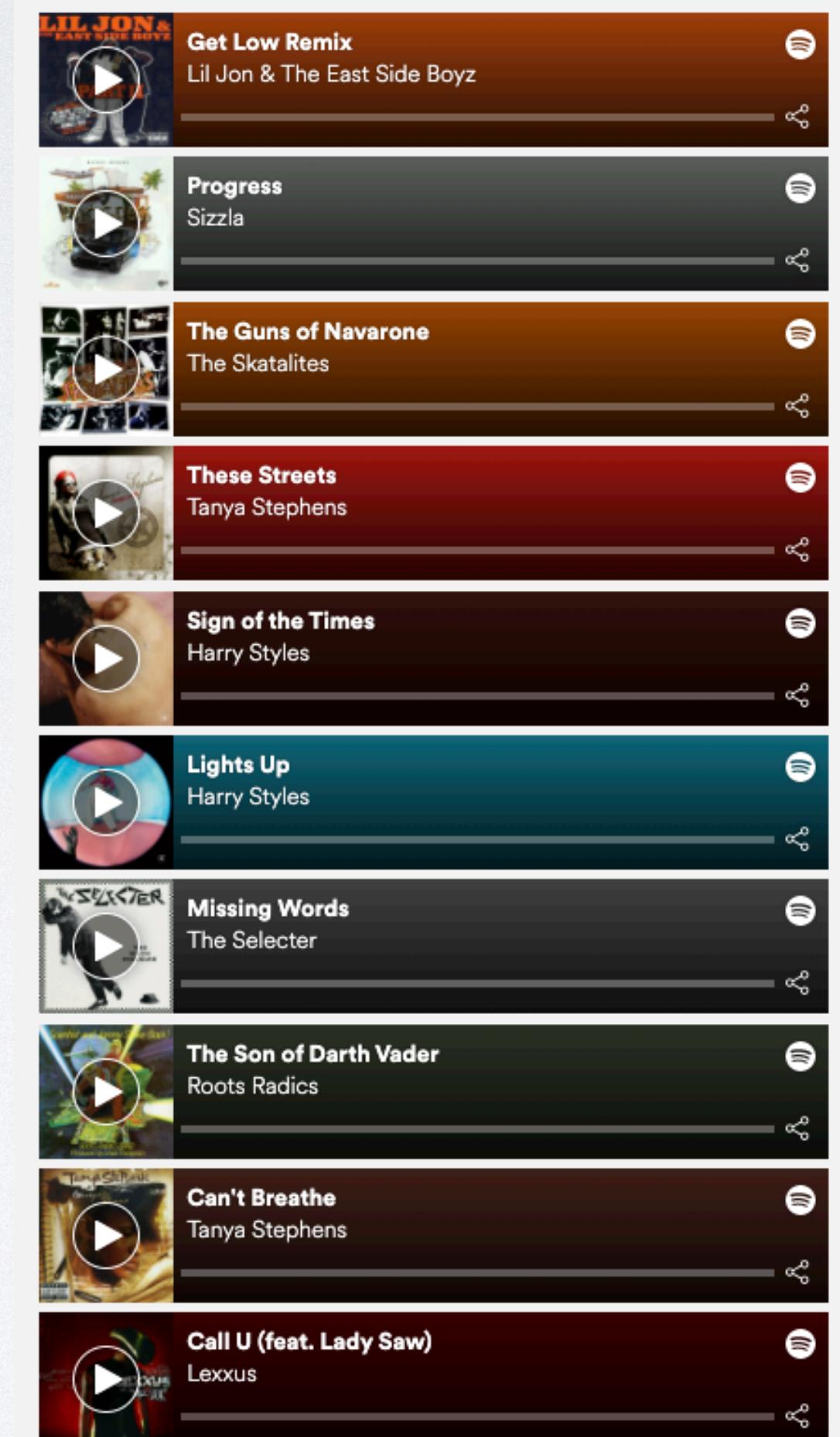
Continue to survey →

# Nudges in music genre exploration

Personalized

Slider to control the recommendations with different personalization level (0.0 - 1.0)

- Representative position (genre-typical tracks)
- Personalized position



Save playlist to my Spotify

Continue to survey →

# Nudges in music genre exploration

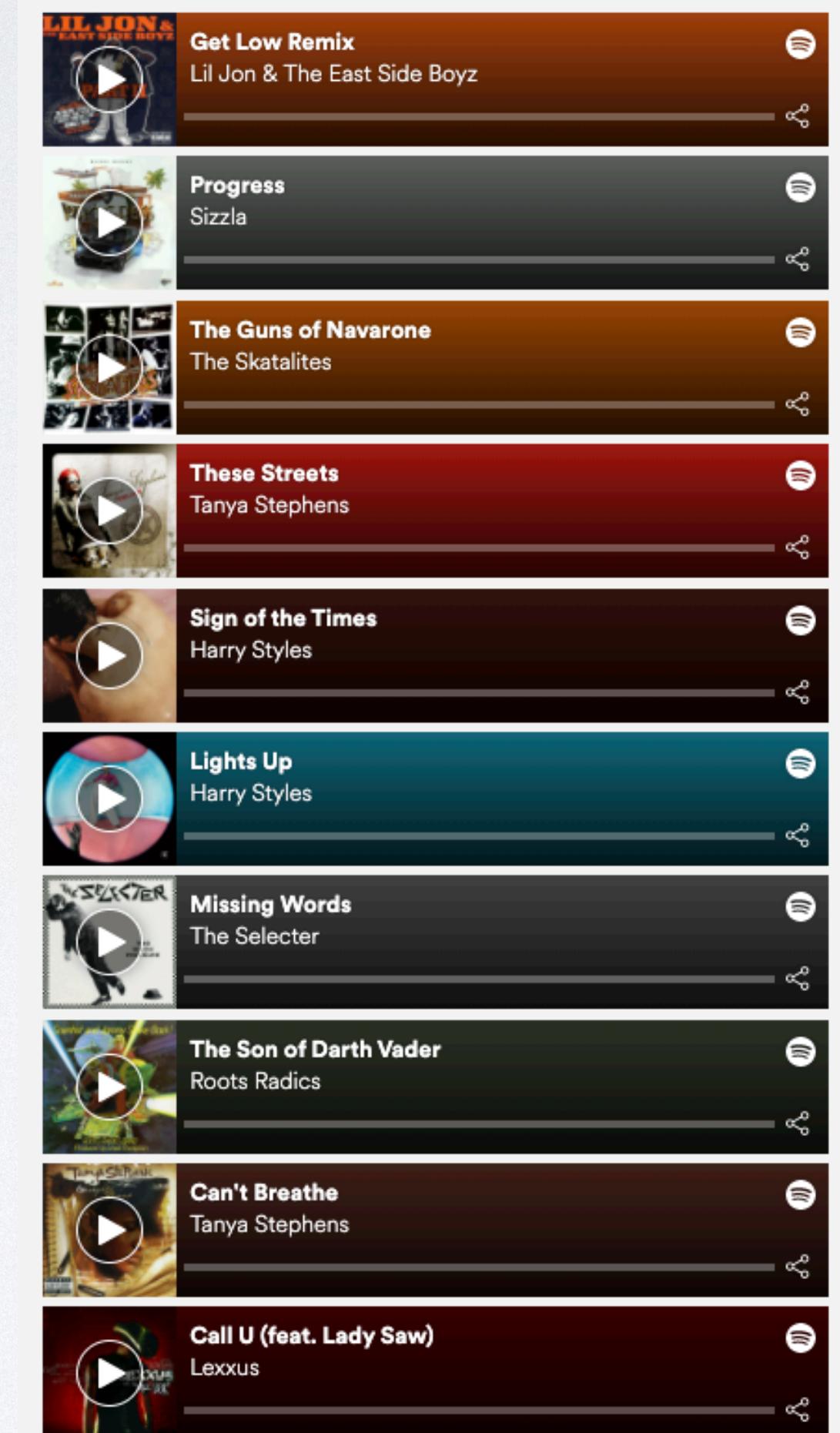
Personalized

Slider to control the recommendations with different personalization level (0.0 - 1.0)

- Representative position (genre-typical tracks)
- Personalized position

Default slider as nudges

- Users tended to explore further away from current preferences when the default slider was more representative



Save playlist to my Spotify

Continue to survey →

# Nudges in music genre exploration

Personalized

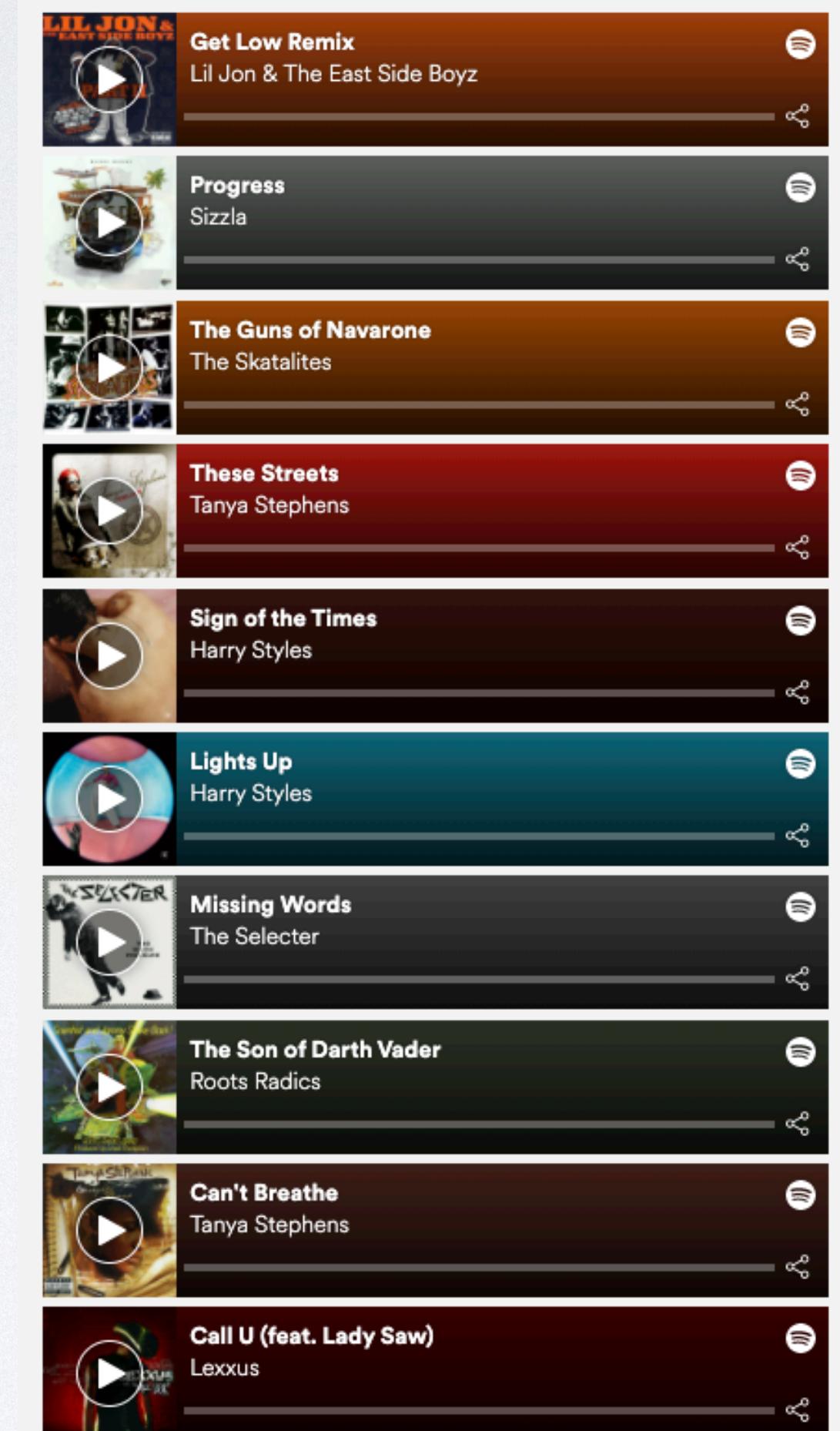
Slider to control the recommendations with different personalization level (0.0 - 1.0)

- Representative position (genre-typical tracks)
- Personalized position

Default slider as nudges

- Users tended to explore further away from current preferences when the default slider was more representative

Perceived helpfulness within a single session —> users did not actually experience the playlist



# Open questions

What about users' behavior in the long run?

Do users develop new preferences over time?

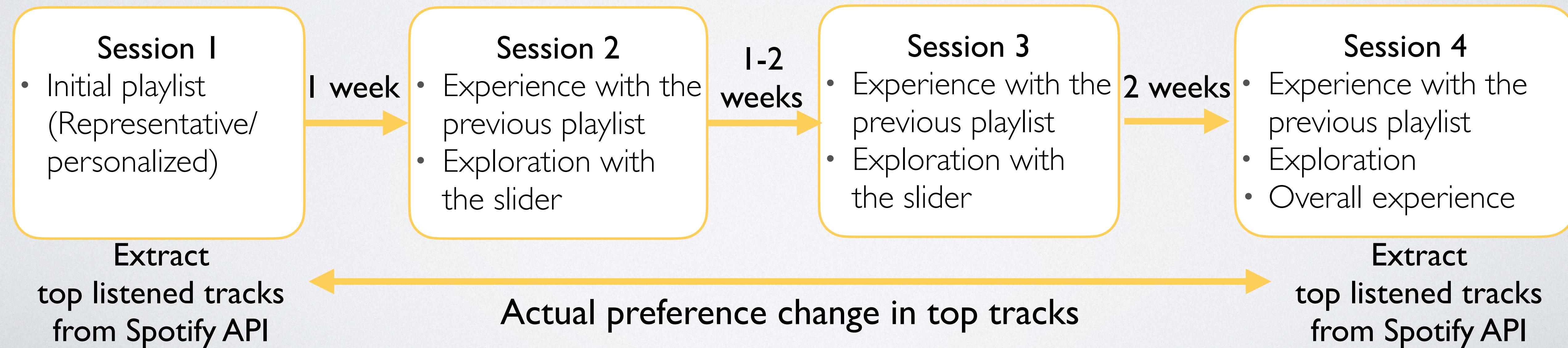
Is nudging really effective to help users develop new preferences in the long run?

...

**LONGITUDINAL STUDY!**

# Longitudinal study

A longitudinal study on **users' exploration behavior and listening preference change** over time after interacting with the music genre exploration tool for **four sessions** in six weeks



# Research questions

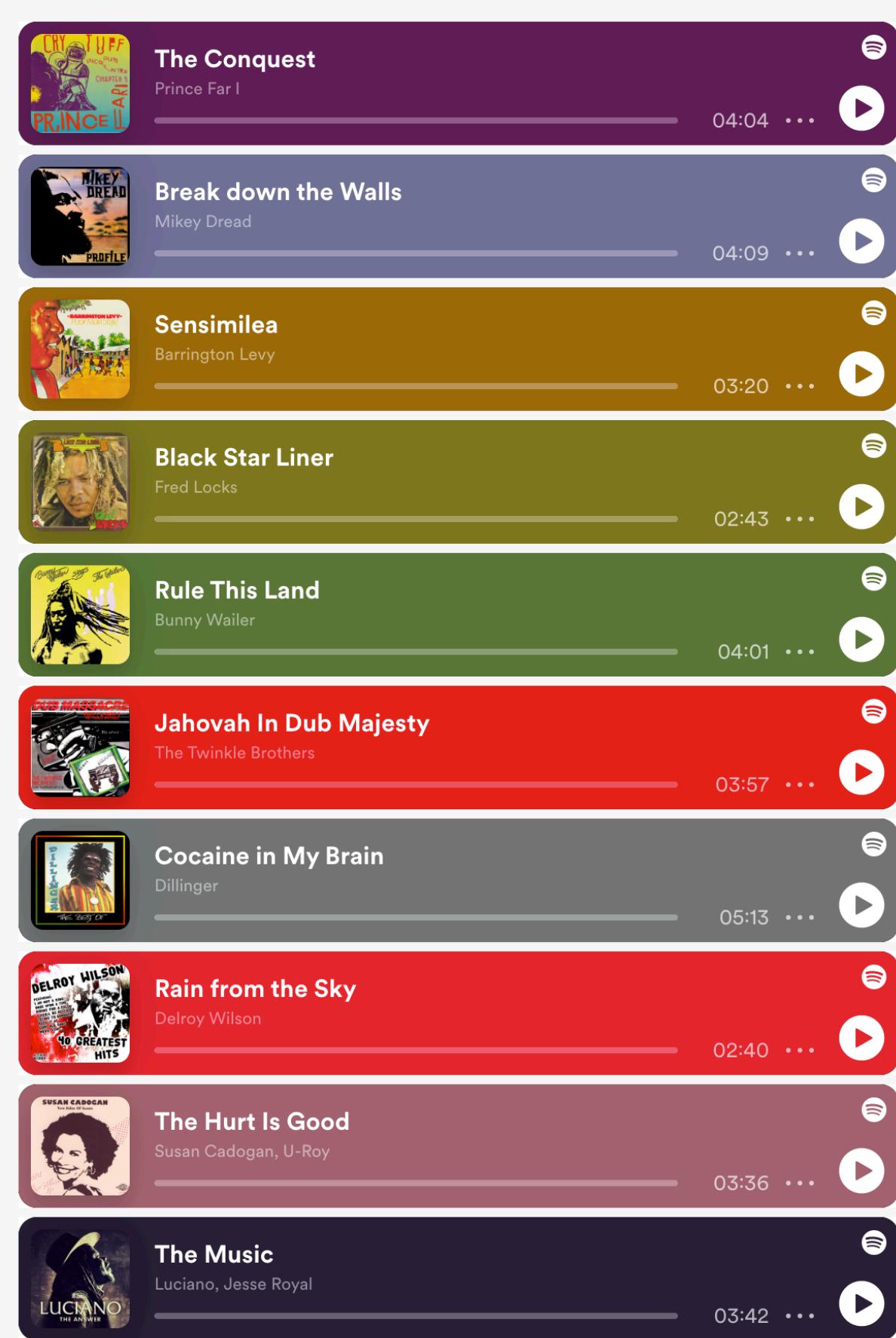
**RQ1: [The effect of nudge on the initial exploration (Session 1)]** How do default recommendations influence users' initial exploration experience with the exploration tool?

**RQ2: [The effect of nudge on subsequent sessions (Session 2 – 4)]** How do user interaction with the system and exploration behavior change across subsequent sessions? Does any effect of nudge persist or fade across the sessions?

**RQ3: [Overall experience and actual preference change (Session 4)]**

- RQ3a: How do users' overall experience and system usage depend on nudges?
- RQ3b: Does genre exploration result in actual preference change?

# Two nudges - Default initial playlist



Example Session I playlist

After selecting a genre to explore, users were presented with one of the default initial playlists (Session I)

- Representative (personalization level 0.2)
- Personalized (personalization level 0.8)

# Two nudges - Visual anchors

(a) Playlist

- That Fire - Tanto Metro & Devonte
- How Does It Make You Feel? - Adrian Sherwood V...
- Queen Face - Junior Reid, Anthony B, Vybz Kartel
- Bonifide Love - Wayne Wonder
- For Hire and Removal - 12" Mix - Eek-A-Mouse
- Wire - Leaping Dub - Massive Attack
- Shaka Special - Jah Shaka
- Street 66 - Linton Kwesi Johnson
- Big Beat Bam - Remix - Sister Nancy
- She Loves Me Now - Cocoa Tea

(b) The trade-off slider

Representative      Personalized

(c) Control for showing history

Show exploration history: Off

(d) Contour plot visualization

Exciting      Positive  
Negative      Calming

More danceable      More acoustic  
Less acoustic      Less danceable

Continue and save the playlist to my Spotify →

With or without visual anchors on their previous exploration position (Session 2 - 4)

- Tracking exploration history

Nudges were manipulated between subjects

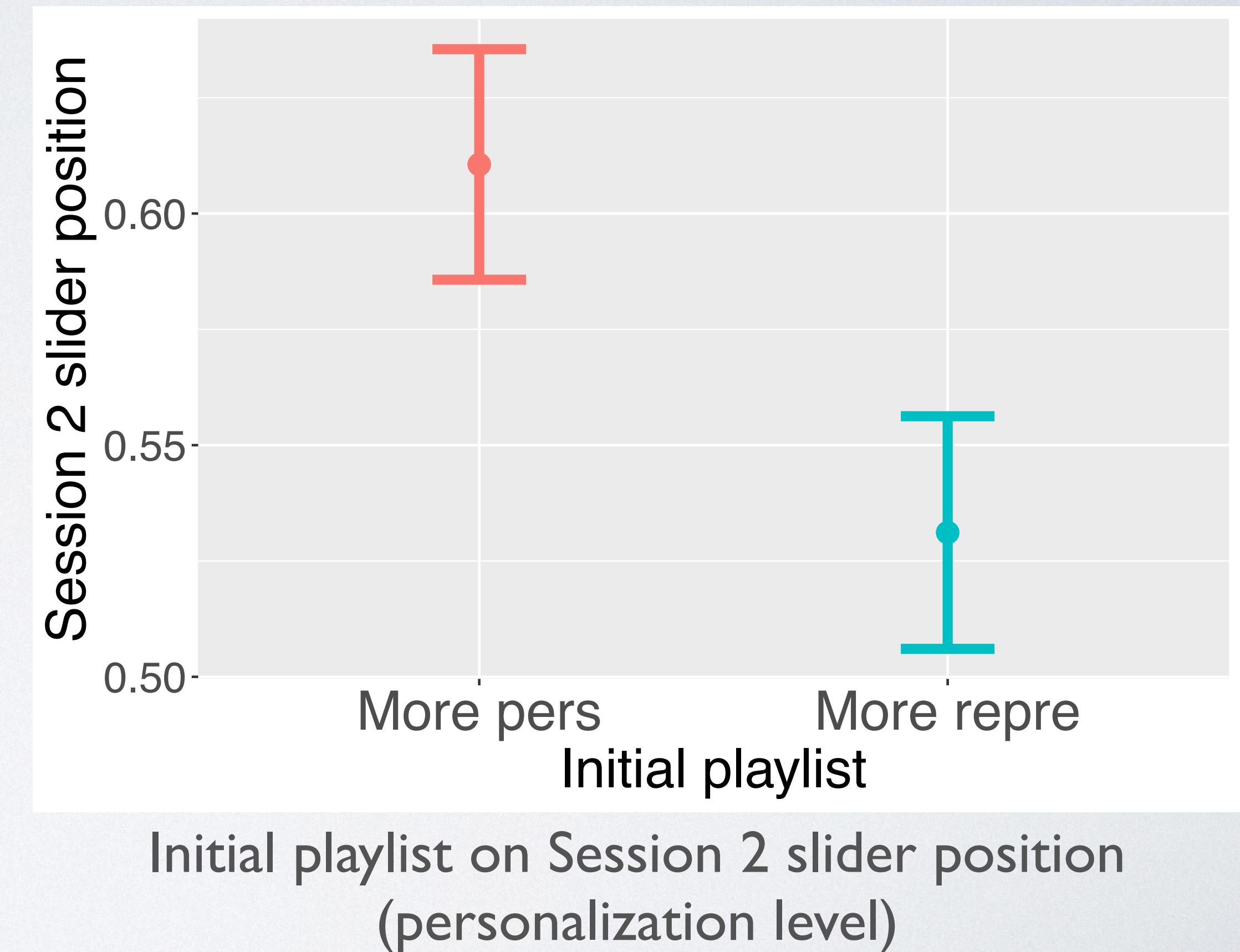
338 participants with an active Spotify account from Prolific (187 male, 150 female)

# Initial exploration experience after Session I (RQ1)

When the selected genre was further away

- Users were more likely to listen to the playlist and discover new songs
- Users also perceived the playlist to be more helpful and satisfied

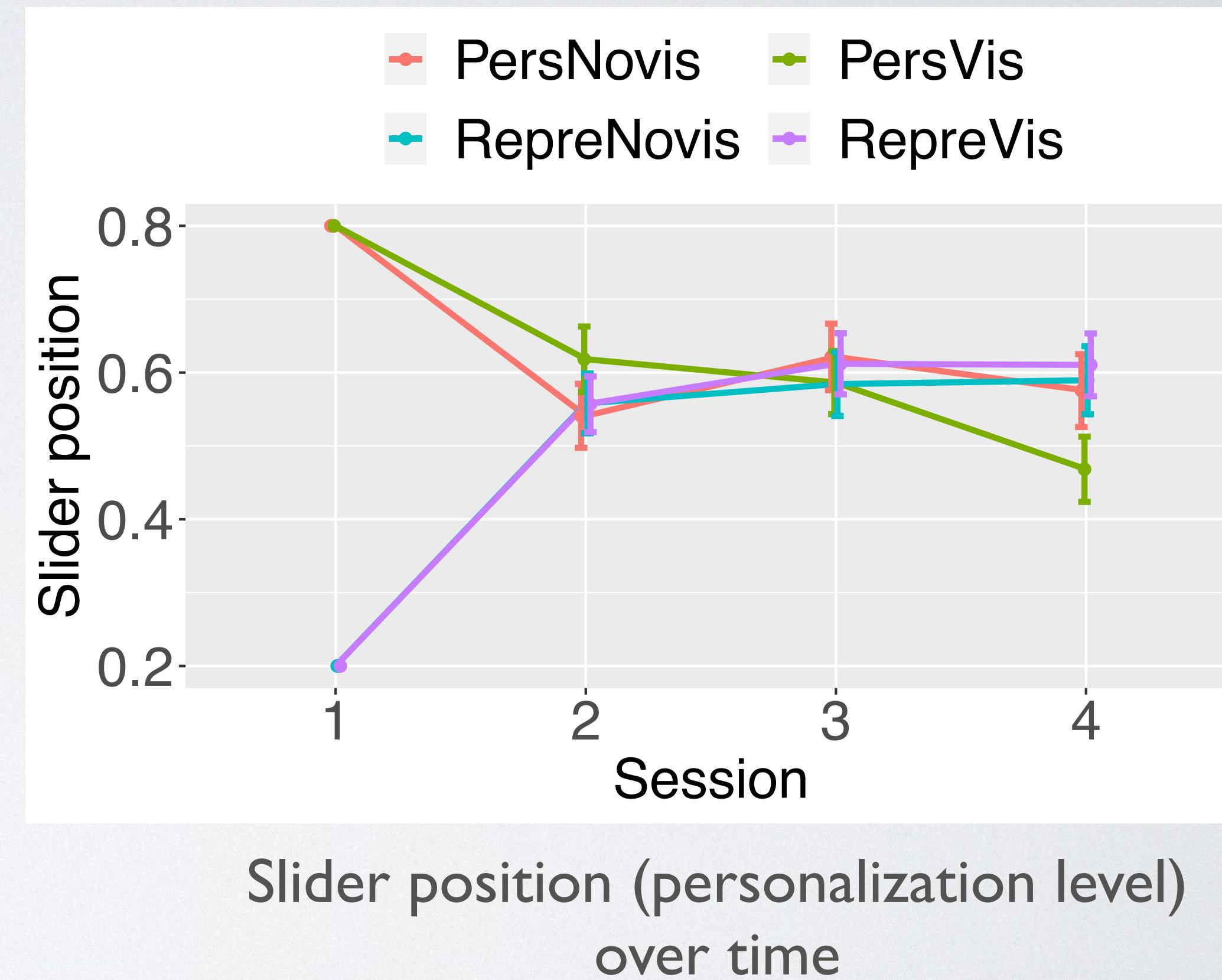
Effect of default playlist on slider position -> the default initial playlist influenced where users put slider in Session 2



# Over time (RQ2) - Slider position

After Session 2, users seemed to put the slider somewhere in the middle

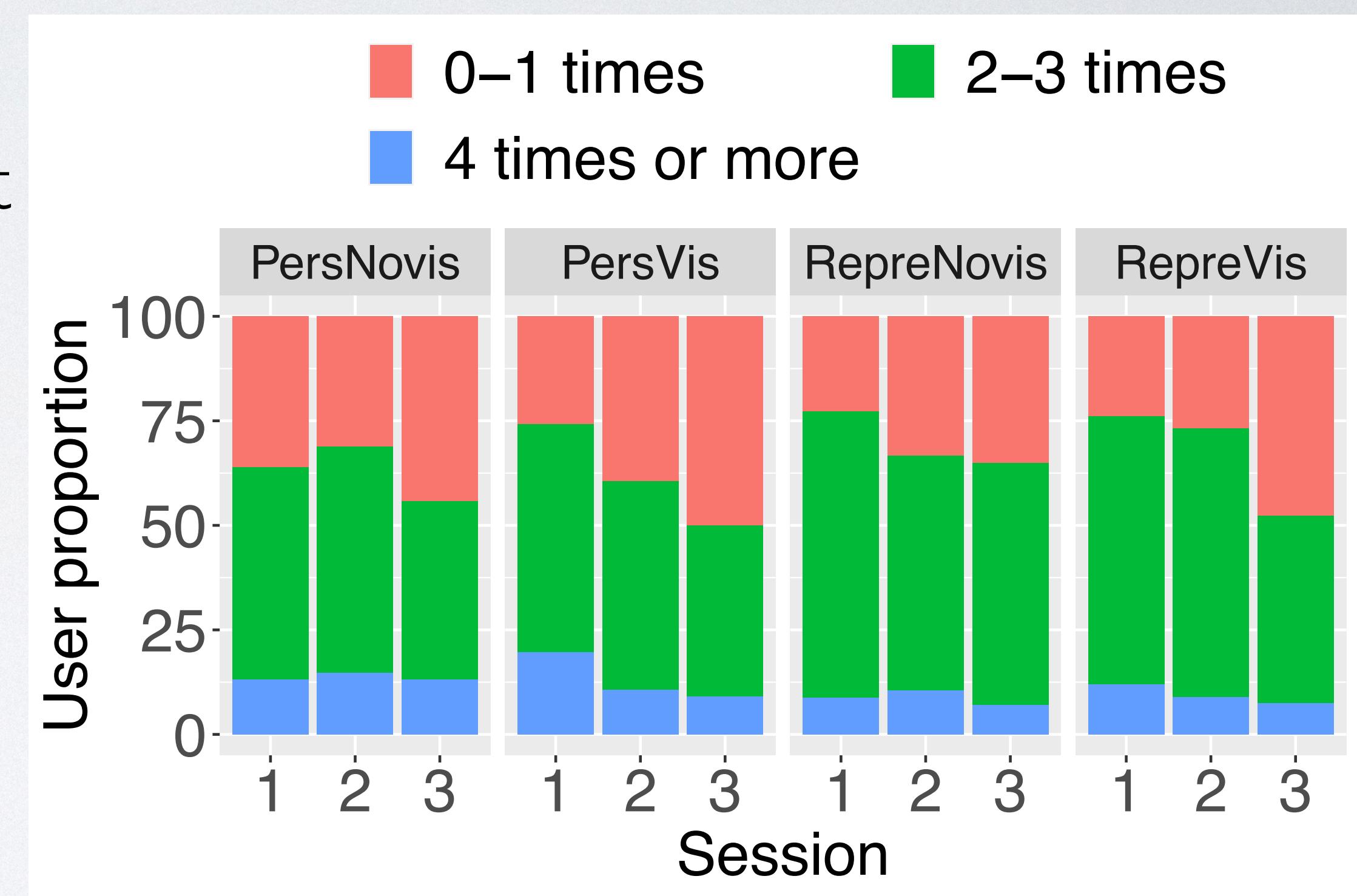
- The effect of default playlist on the slider position quickly faded after Session 2
- No effect of visual anchors on the past exploration positions



# Over time (RQ2) - User engagement

Over the 6 weeks, user activities dropped somewhat but users were still quite engaged after 4 weeks

Over the 6 weeks, users perceived the playlist to be more personalized and helpful

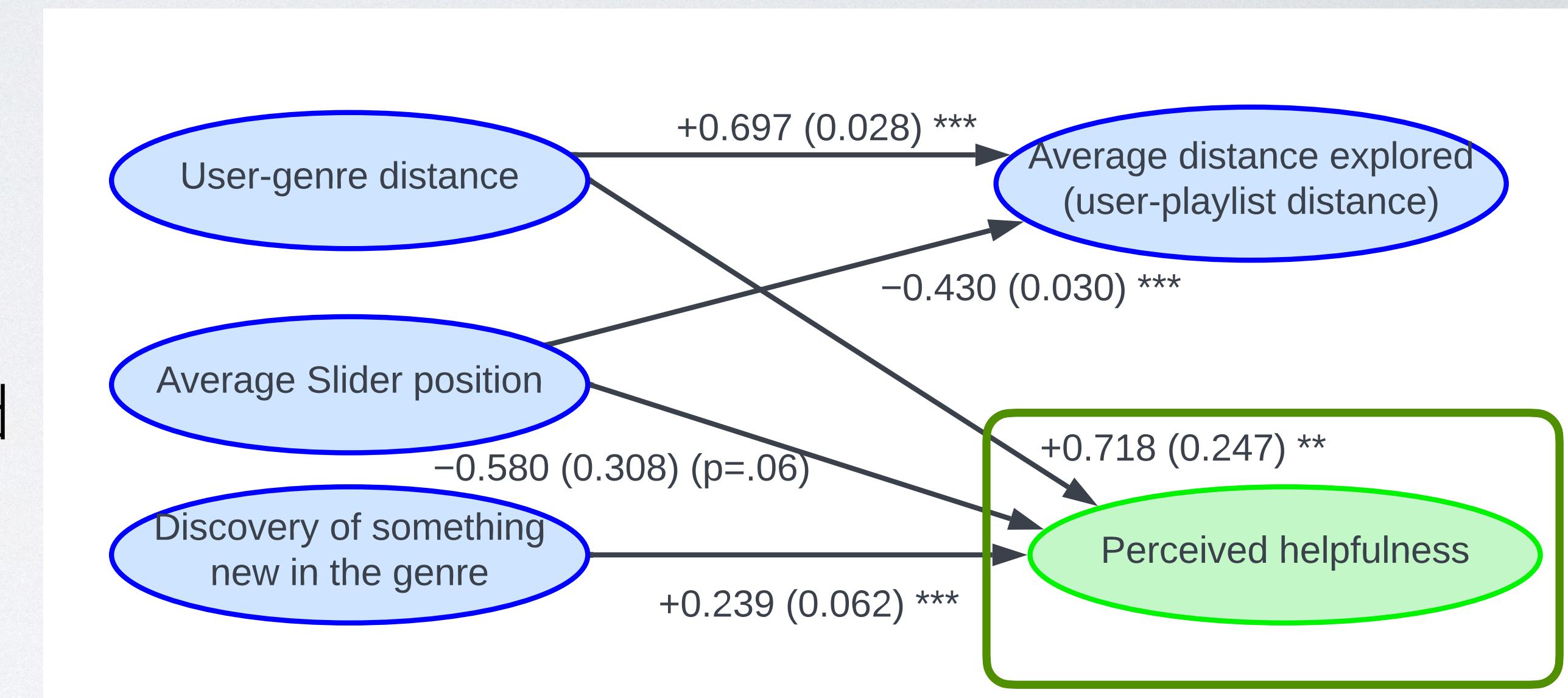


How many times listening to the playlist?

# Overall experience (RQ3): Session 4

The system was perceived to be more helpful when:

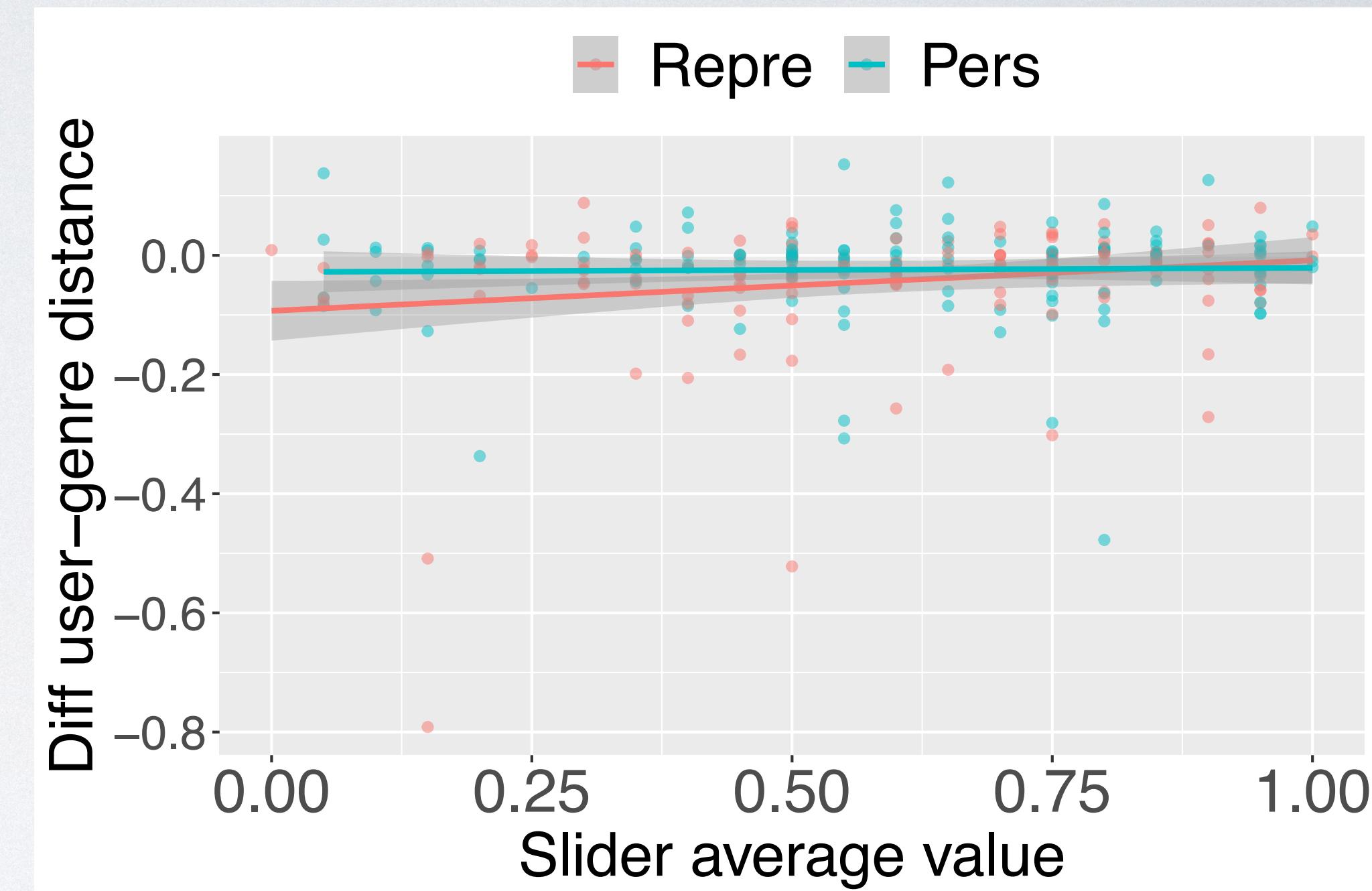
- The selected genre was further away
- Users put the slider at a less personalized position (on average)
- They discovered something new



# Actual preference change (RQ3)

Users extended their preferences to include some music from the new genre (measured with Spotify top-listened tracks)

- **Moving closer to the selected genre:** user-genre distance was smaller in Session 4 than in Session 1
- **Residual effect of default slider:** the preference change was larger for users with the representative default playlist
- **Listening frequency matters:** the change is smaller for users who listened to Spotify more frequently, as they might listen to more other music



Change in user-genre distance between Session 4 and Session 1 as a function of average slider value

# Limitations

- Users' listening behavior was tracked via self-reported surveys rather than actual behavioral data
- Preference change only measured on top-listened tracks (confounding factors)
  - for example: playing the playlist as background music

# Conclusions

A longitudinal study on users' exploration behavior and listening preference change across 6 weeks and 4 sessions

- The genre exploration tool was perceived to be helpful to explore music genre effectively
- > **Users extended their preferences to include some music from the new genre**
- **The effect of nudge did not seem to persist across sessions (except Session 2)**

Nudging was effective on users' actual preference change, especially for those with the representative default slider -> **Potential benefits of combining nudging with personalization in exploration tools in a long run**

# Thanks for Your Attention!



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