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Tapping to your own beat

Experimental setup for exploring subjective tacti distribution and pulse clarity

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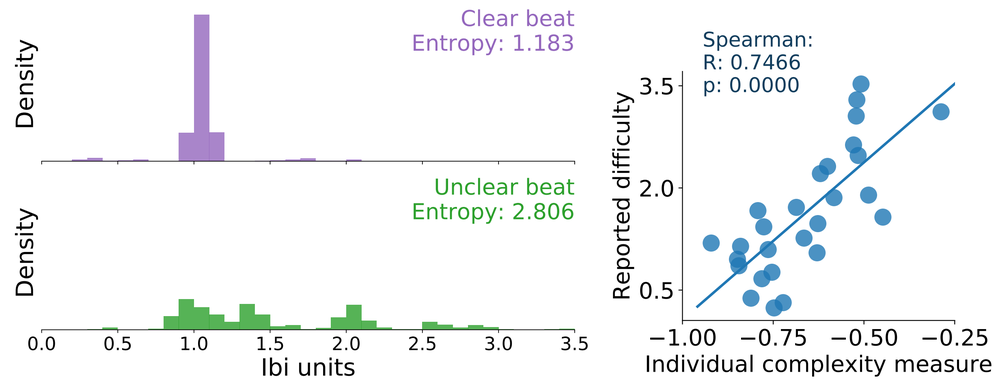
TL; DR

An **experimental setup** where participants tap freely to the beat allows exploring **subjective tacti** and retrieves a **pulse clarity** metric that correlates with tapping difficulty.



3' Speech

Grand goal: analyze the effects of different possible tacti in pulse clarity.

Previously...

- **Rhythmic complexity** has been related to **affect** in music. [Witek et al., 2014, Matthews et al., 2019]
- In experiments it is generally measured as **tapping asynchrony** to a target tactus. This captures difficulty to keep a steady beat against non-isochronous onsets.

Our question:
What happens with complexity that arises when a rhythm conveys **no clear pulse** or allows **multiple tacti interpretations**?

What's New

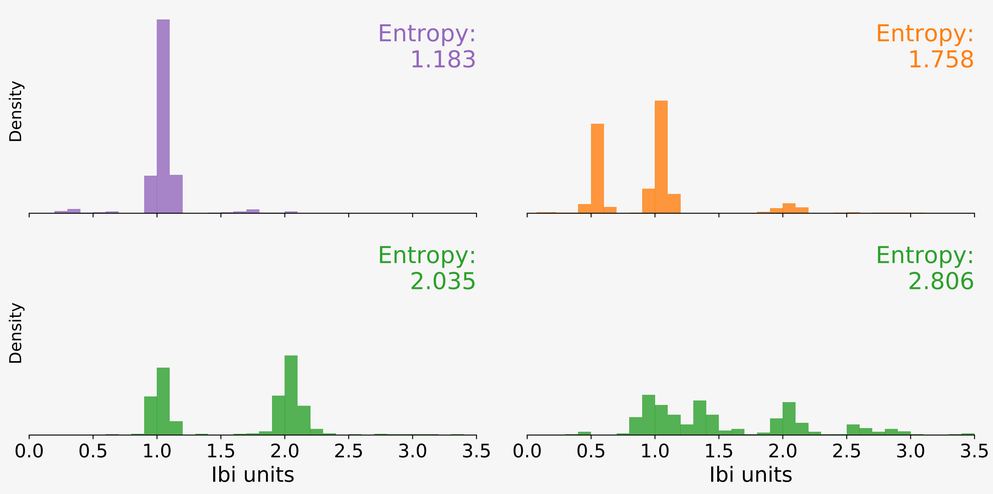
- We tested a new experimental setup were participants chose **freely** which tactus to tap. Participants reported **difficulty** to tap a steady beat.
- We gathered an **individual complexity measure** to capture how clear the beat was to the participant.
- We gathered a **populational complexity measure** to distinguish between situations where no beat was clear, where several tacti were possible or where one was agreed on.

Did it work?

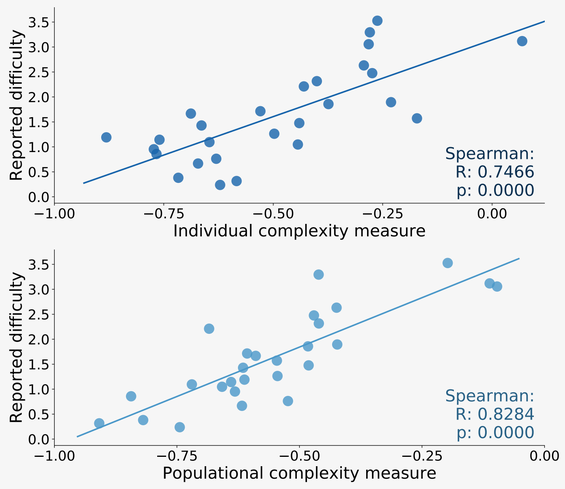
- Both proposed complexity measures **correlated significantly** with reported difficulty.
- Participants were also asked how **musical** the stimuly was and whether they **felt the need** to move. Measures presented a **U-shaped** relationship with the reports.

Results

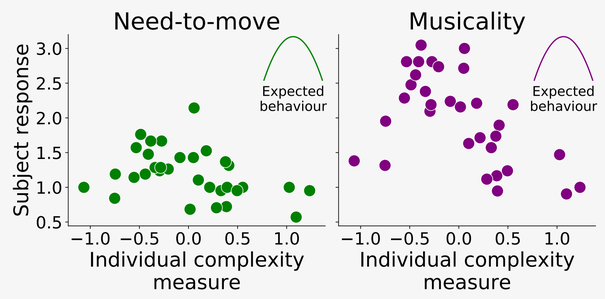
The populational measure presents the distribution of subjective inter-tap-itervals in examples where the beat is clear and when it is diffuse (top-left to bottom-right).



Both populational and individual metrics correlated significantly with mean reported difficulty.



Individual complexity measure displayed an inverted U-shaped relationship with Musicality and Need-to-move responses.

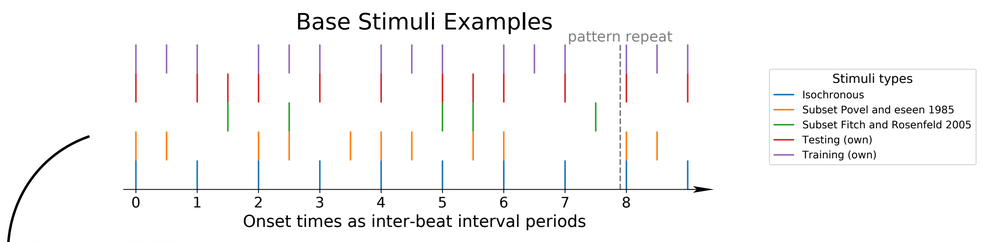


The Details

The Experiment

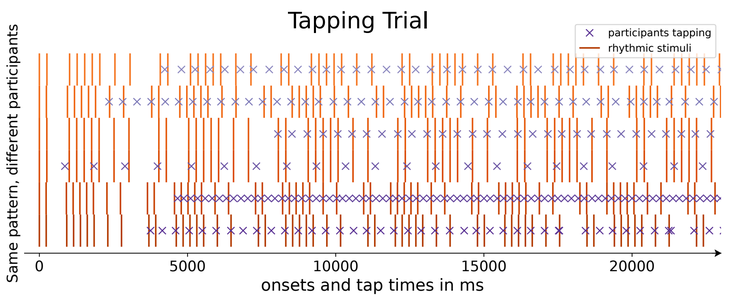
Objective: gather subjective tapping data on varying complexity rhythmic stimuli

Procedure: participants listened to the rhythmic patterns and tapped along to whichever beat they felt more reasonable, if any



IBI in range 450-530ms

Pattern repeat
until duration > 25ms



Questions:
> Tapping Difficulty
> Pattern Musicality
> Need-to-move feeling

5-scale likert

Questionaire:
relationship with music

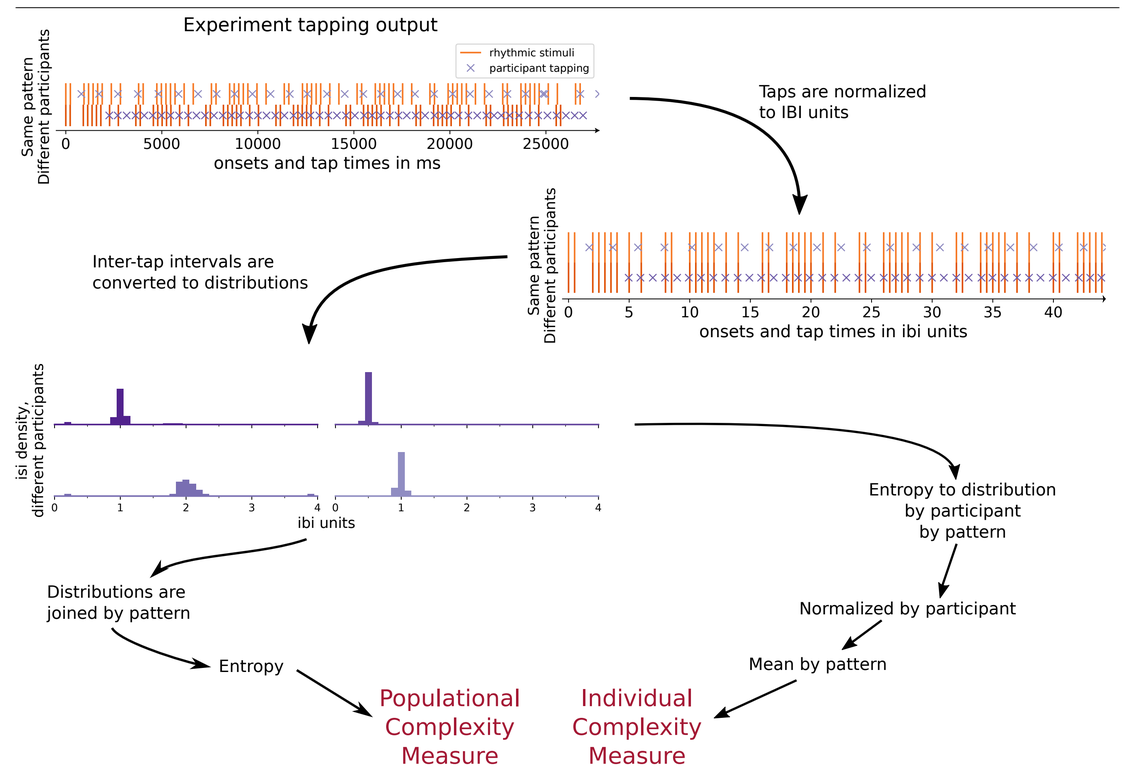
Trial

Blocks:
> Training (7)
> Randomized
(7 + 7 + 7 + 5)

(~25 min)

Participants
> 28 Participants (8 Woman)
> Mean age: 28.5 years (8.15 sd)
> Mean musical training:
4.43 years (3.81 sd)

The Analysis



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