musicassessr: : CHEAT SHEET

User Dependencies: A good knowledge of *psychTestR* and the *R* programming language.

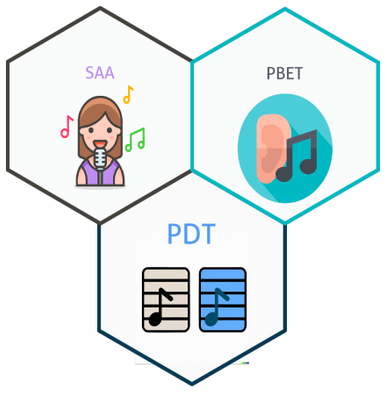
About

musicassessr is an R package which builds on top of ***psychTestR*** (Harrison, 2018) to :

Deploy music (production) tests and **musical stimuli** and **record/score musical behaviour** in a web browser.

It serves several music production tests in development.

Music (Production) Tests



SAA: Singing Ability Assessment

```
devtools::install_github('sebsilas/SAA')
```

PBET: Playing By Ear Test

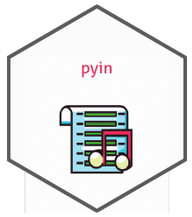
```
devtools::install_github('sebsilas/PBET')
```

PDT: Pitch Discrimination Task

```
devtools::install_github('sebsilas/PDT')
```

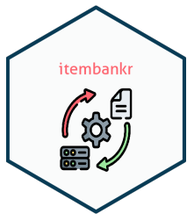
COMING SOON:
Rhythm Tapping Test
Sight Reading Test
Sight Singing Test
Adaptive tests

Supplementary Packages



***pyin*:** Transcribe monophonic audio in R via the pYIN algorithm.

```
devtools::install_github('sebsilas/pyin')
```



itembankr: Produce musicassessr-compatible musical item banks with useful melodic features

```
devtools::install_github('sebsilas/itembankr')
```

Top Level

Instantiate a *musicassessr* test

```
See: ?musicassessr::make_musicassessr_test
```

Trial blocks

Arrhythmic melody trials

```
See: ?musicassessr::arrhythmic_melody_trials
```

Rhythmic melody trials

```
See: ?musicassessr::rhythmic_melody_trials
```

Long tone trials

```
See: ?musicassessr::long_tone_trials
```

Record audio block

```
See: ?musicassessr::record_audio_block
```

Record MIDI block

```
See: ?musicassessr::record_midi_block
```

Pages

Record (and transcribe) audio

```
See: ?musicassessr::record_audio_page
```

Record (and transcribe) MIDI

```
See: ?musicassessr::record_midi_page
```

See also: *play_melody_loop*; *microphone_calibration_page*; *record_key_presses_page*;

Quality Control

Collect user instrument/vocal range

```
See: ?musicassessr::get_instrument_range_pages
```

Collect user signal-to-noise ratio (SNR)

```
See: ?musicassessr::get_SNR_pages
```

Present Stimuli

```
See: ?musicassessr::present_stimuli
```

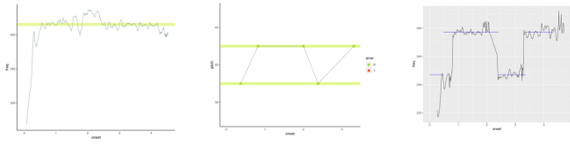
Stimuli Types

"digits", "letters", "words", "images", "video", "audio", "midi_notes", "frequencies", "pitch_classes", "scientific_music_notation", "rhythms", "midi_file", "musicxml_file"

Display Modalities

"visual", "auditory", "both"

Feedback



Audio Scoring

Some example scoring measures:

Measure	Description
Melodic Similarity	
harmcore	Edit Distance of harmonic symbols per segment, obtained via Krumhansl's tonality vectors.
ngrukkon	Ukkonen measures for n-grams on raw pitch values
rhythfuzz	Edit distance of classified length of melody tones
opti3	A hybrid measure of melodic similarity comprising a weighted sum of of *harmcore*, *ngrukkon* and *rhythfuzz* (Müllensiefen & Frieler, 2004)
Melodic Singing Accuracy	
Note precision	The consistency with which a singer produces specific pitch classes (Pfordresher et al. 2010)
Note accuracy	Average proximity of each produced F0 to each target F0 (Pfordresher et al. 2010).
Long Note Singing Accuracy	
Accuracy	The general accuracy of a sung long note with respect to a target pitch.
Volatility	The tendency for a pitch curve to be erratic, rather than stable
Scoop	Amount of "scooping" or changing towards a target note.

See: https://github.com/sebsilas/musicassessr/blob/master/R/scoring_melodic_production.R

Core References

- Silas, S., Müllensiefen, D., & Kopiez, R. (2023). Singing Ability Assessment: Development and validation of a singing test based on item response theory and a general open-source software environment for singing data. *Behaviour Research Methods*.
- Silas, S., & Müllensiefen, D. (2023). Learning and recalling melodies: A computational investigation using the melodic recall paradigm. *In Review, Music Perception*.
- Silas, S., Kopiez, R., & Müllensiefen, D. (2021). *What makes playing by ear difficult?* SEMPRE conference.

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Affiliations & Support:

Learn more at **https://sebsilas.github.io/musicassessr/**