

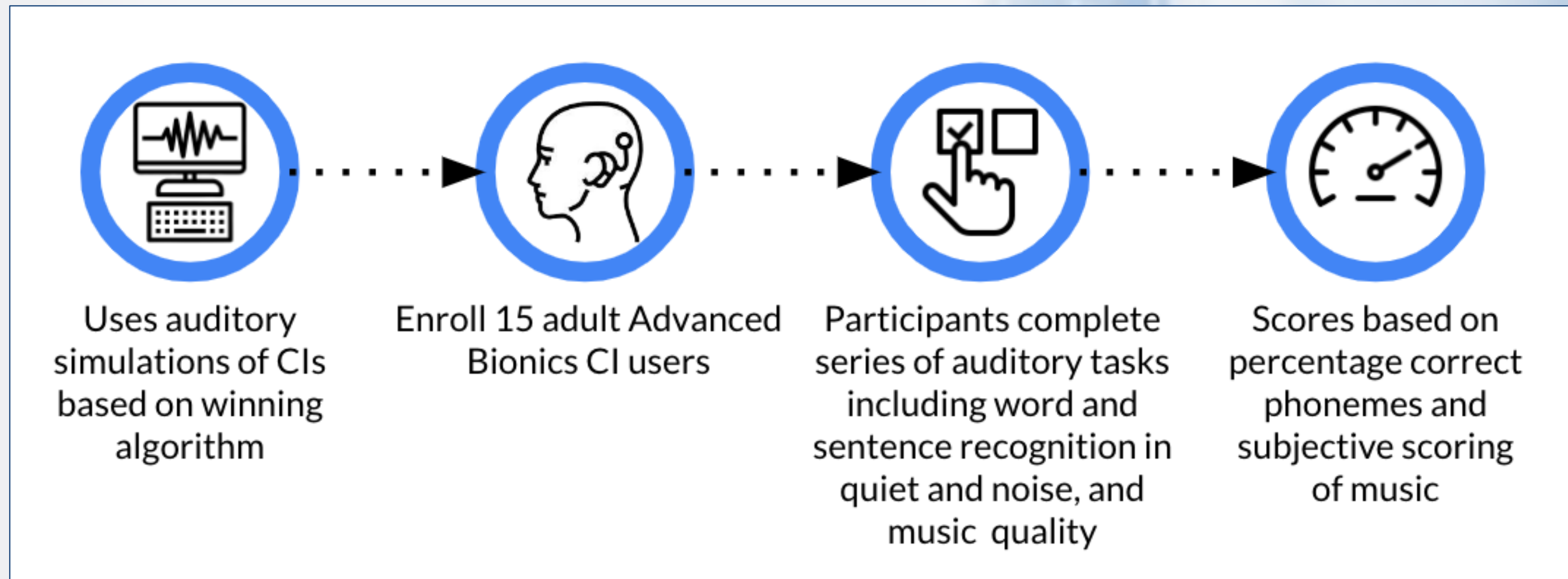
Evaluation of Crowdsourced Entries from a Cochlear Implant Hackathon in CI Recipients

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BACKGROUND

Cochlear implants (CIs) are biomedical devices that translate sounds into electrical signals to stimulate the auditory nerve. However, cochlear implant technology has plateaued in recent years, with users often reporting limitations in sound clarity, hearing in noise, and music appreciation. The Cochlear Implant Hackathon in 2020 generated several innovative crowdsourced sound processing algorithms that outperformed the current commercial technology as assessed by a vocoder. This study aims to evaluate the feasibility of testing these novel algorithms in cochlear implant recipients.

METHODS



RESULTS

Early results (N=2) did not demonstrate significant differences between pre-processed audio samples and the current commercial software. The web-based research platform functioned well, captured relevant data, and no major issues with implementation of the research protocol were found.

DISCUSSION

This feasibility study represents the first attempt to directly test crowdsourced sound processing algorithms in CI recipients. Though initial testing with 2 participants did not show statistically significant improvements, this work could pave the way for future research to further optimize sound processing strategies and improve hearing outcomes for cochlear implant users. Limitations include the small sample size and the inability to directly manipulate implant hardware.

ACKNOWLEDGEMENTS

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Can novel crowdsourced sound processing algorithms help people with cochlear implants hear better?



Take a picture to listen to audio samples

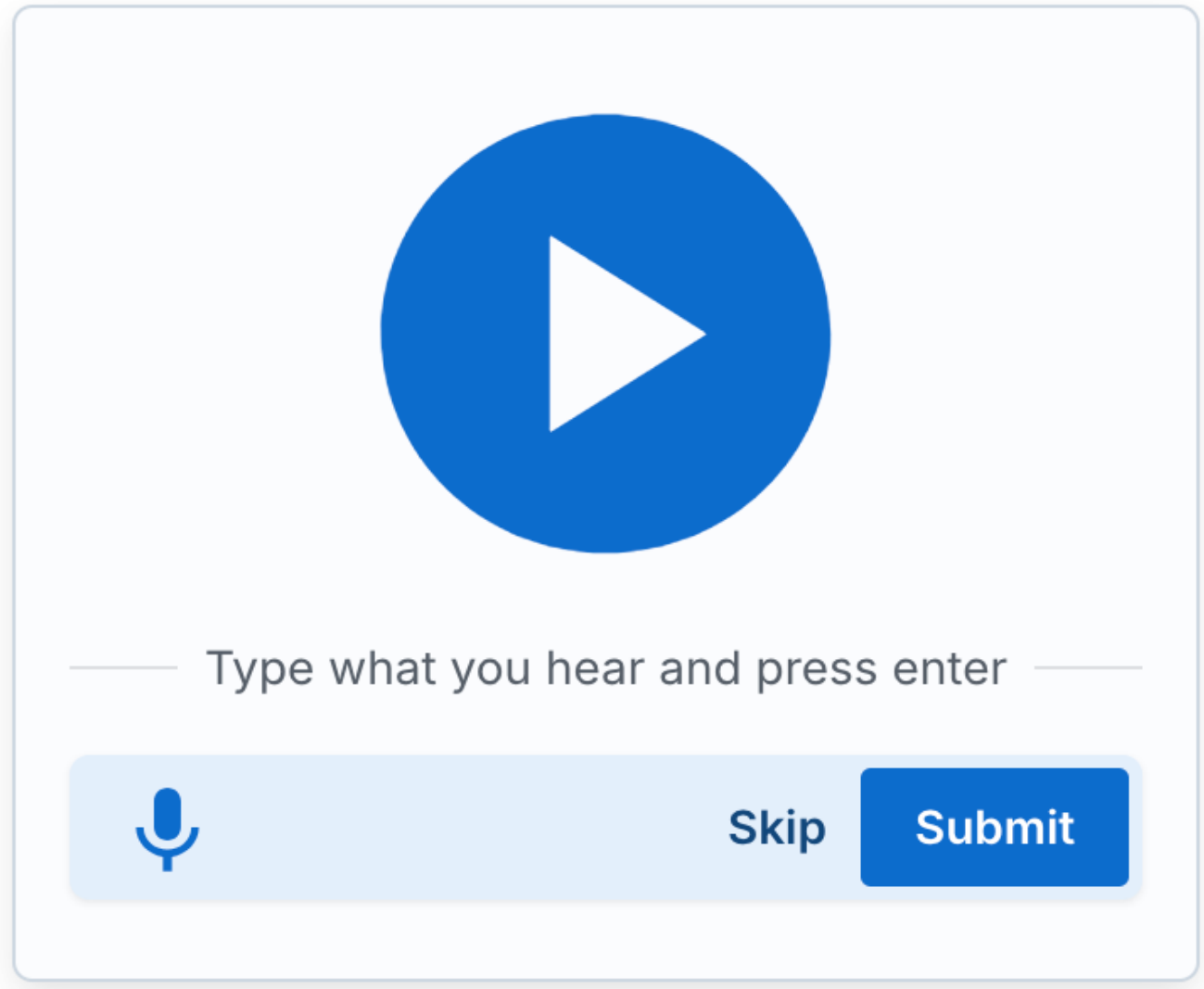


Figure 1. Open set listening tasks present audio simulations of what a cochlear implant would sound like for a CI recipient and asks participants to respond with what they hear.

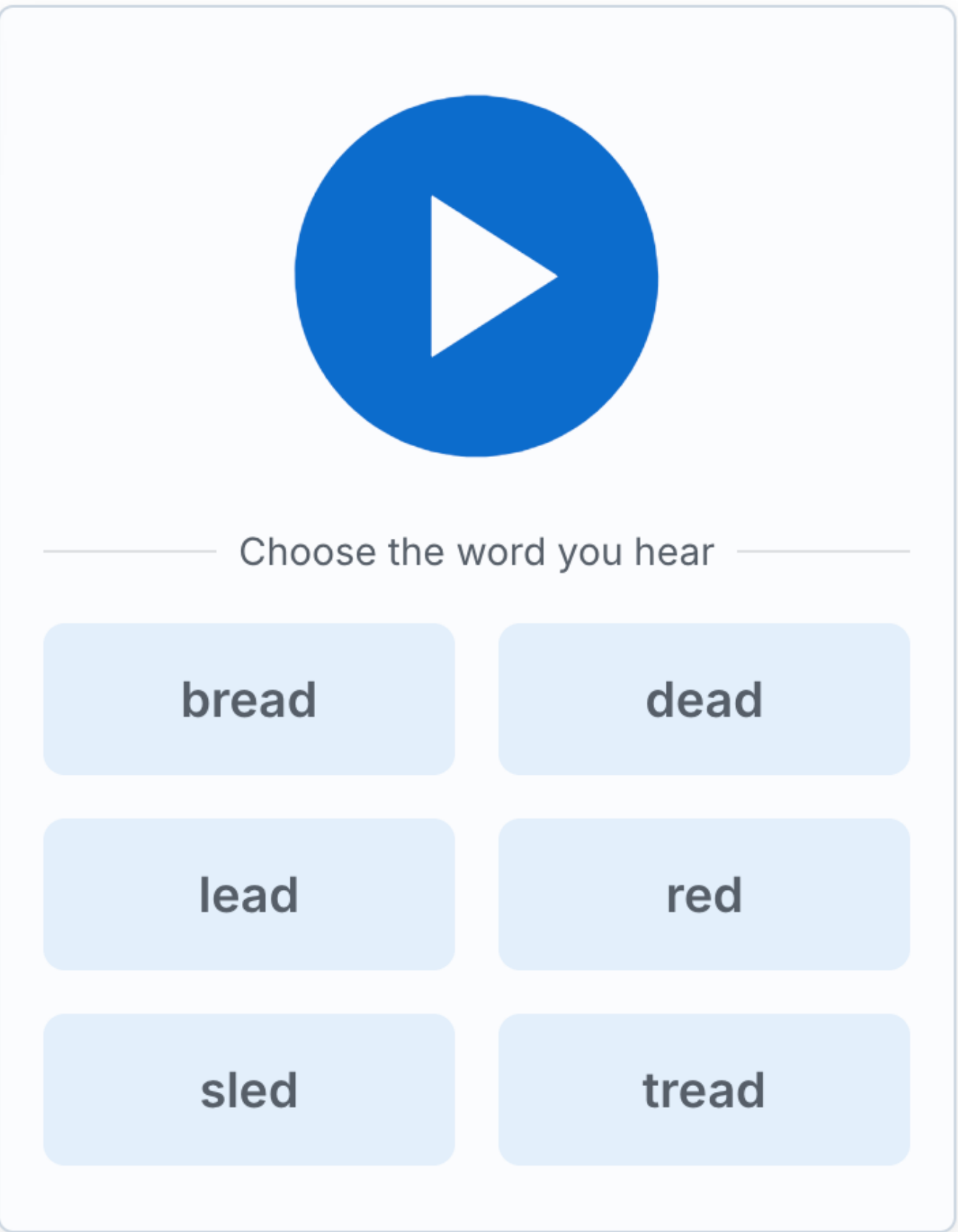


Figure 2. Closed set listening tasks asks participants to choose from a list of similarly sounding words.

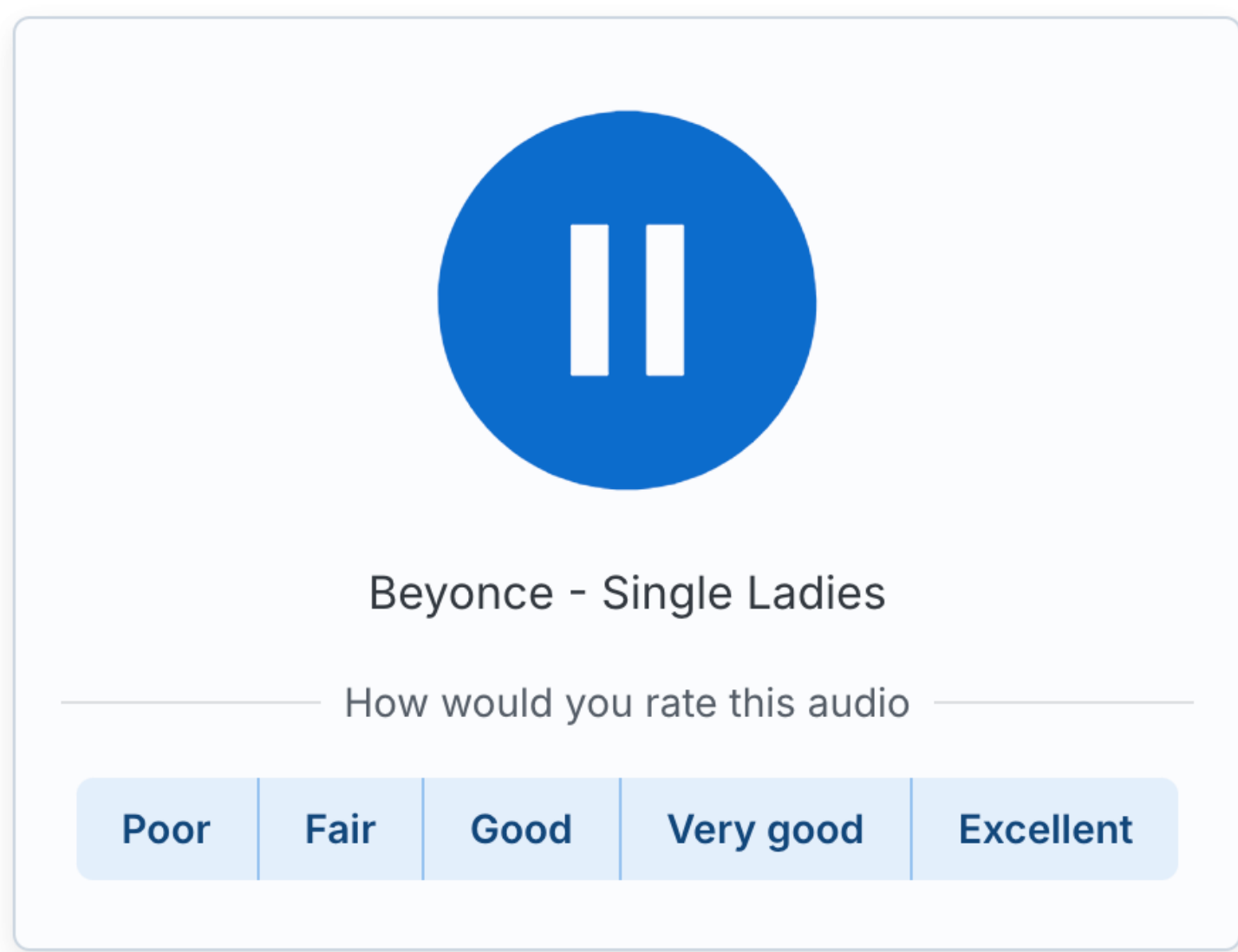


Figure 3. Subjective listening tasks asks participants to evaluate music.

