



DOLBY LABORATORIES

Final Presentation

Abha Dash, Jaden Duong, Ivan Hsu, Kavni Shah, Max Stahl, Alyssa Vo, Cyn Wang, Joy Zhang

Agenda



TEAM & PROJECT INTRODUCTION



GOALS & DELIVERABLES



RESEARCH PROCESS



DESIGN PROCESS



NEXT STEPS



Meet our Team



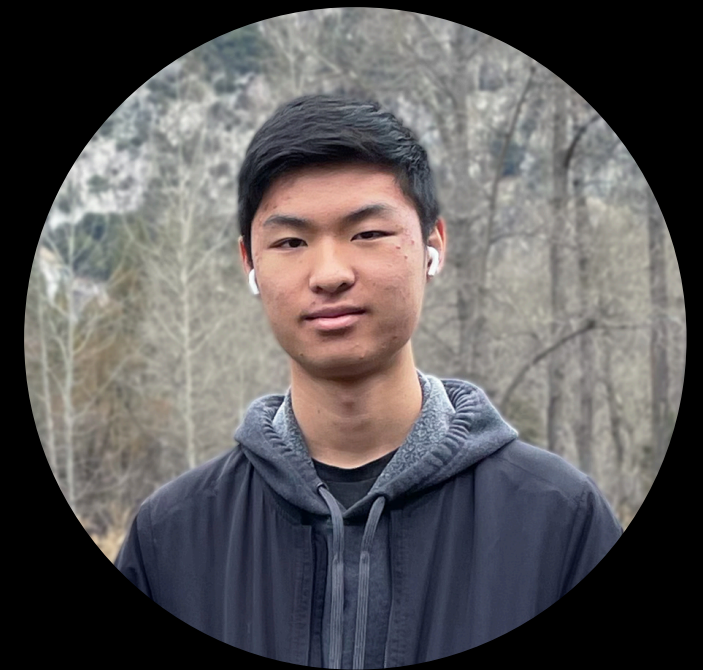
Joy Zhang
She/Her



Abha Dash
She/Her



Cyn Wang
She/Her



Ivan Hsu
He/Him



Meet our Team



Kavni Shah
She/Her



Alyssa Vo
They/He



Jaden Duong
He/Him



Max Stahl
He/Him



Team Management



Nancy Rasche
Professor



Affan Ashraf
Project Owner



Sponsors



Walter Liu
Staff UI Designer



James Manning
Director of User Experience



Xiaotian Zhu
UX Designer



Project Brief & Overview

ABOUT DOLBY LABS

Dolby Laboratories is a **global leader in audio-visual innovation**, developing advanced technologies in audio processing, noise reduction, and immersive experiences for professional and consumer markets.

HEARING LOSS AND CALIBRATION

Hearing loss affects millions, but traditional tests can feel intimidating. With accurate audio calibration, everyday devices can provide easy, reliable hearing checks; helping users detect issues early and track their hearing health.



How might we...

design an **engaging & accessible** hearing check that **assists in audio calibration** while **promoting better hearing health**?

Goals

Sponsors tasked us with creating a mobile audio device hearing and calibration test that is:



Engaging & time-efficient; 5 minutes or less to complete



Backed by data & scientific research



Inclusive to users with all levels of hearing loss

Deliverables



Literary reviews and research findings for mobile and/or desktop applications



Analysis of Dolby's competitors in the hearing check space



Mid-high fidelity prototype of a hearing check application with microinteractions such as transitions



Checkpoints

INITIAL RESEARCH

1

GOAL: a research synthesis to guide our potential solutions's approach

PROTOTYPING

2

GOAL: a mid-high fidelity application prototype taking <5 minutes to complete

ITERATIONS

3

GOAL: a high-fidelity prototype more engaging & enjoyable than competitor apps



Literature Review

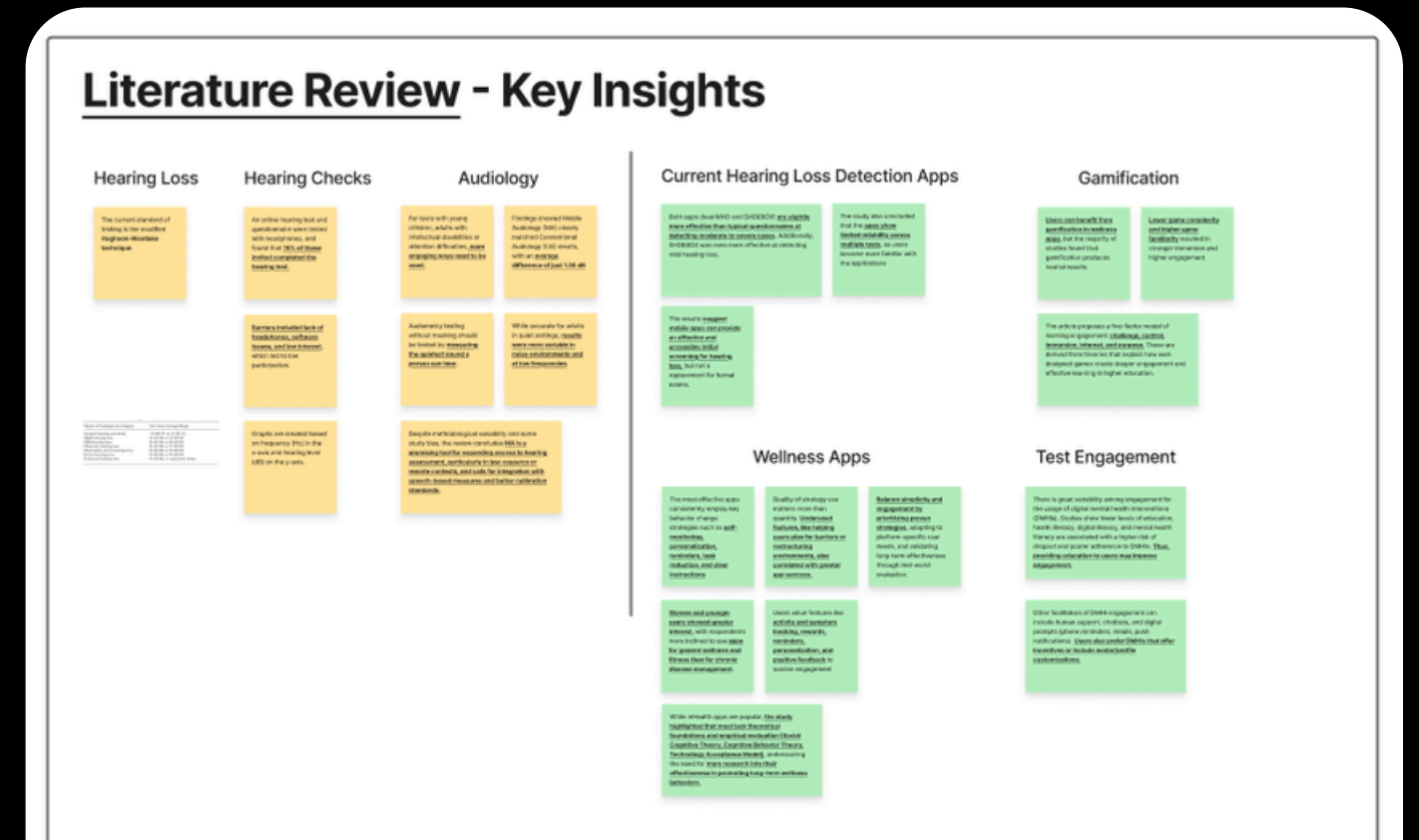
Analysis of 11 scholarly articles on Audiology & Apps to understand the current state

Audiology

- Unengaging tests (low completion rate, dropout, and adherence)
- Mobile test have close accuracy to conventional tests
- Greater accessibility to low-resource areas

Apps

- Prized wellness app features include:
 - Reminders
 - Personalization



Research Keywords	Database	Articles/Citation	In-text citation	Article summary (Describe each of the articles in at least two sentences)
Gamification	Google Scholar	Johnson, D., Detering, S., Kuhn, K.-A., Staneva, A., Stoyanov, S., & Hides, L. (2016, November 2). <i>Gamification for Health and Wellbeing: A systematic review of the literature</i> . Internet interventions. https://pmc.ncbi.nlm.nih.gov/articles/PMC6096297/	(Johnson et al., 2016)	The article talks about a study where they evaluated the effect of gamification on health amongst past studies and reports by conducting their own literature review. It was found that users do benefit from gamification in wellness apps. But the majority of them found that gamification produces neutral results. They identified that it would be on a case-by-case basis, implementing the Self-Determination Theory (SDT). This theory suggests that not all forms of motivation are equal, as every individual will have a different set of intrinsic and extrinsic motivations categorized into three main psychological needs: autonomy, competence, and relatedness.
		Li, M., Jiang, Q., Tan, C.-H., & Wei, K.-K. (2014). Enhancing user-game engagement through software gaming elements. <i>Journal of Management Information Systems</i> , 30(4), 1-36. https://doi.org/10.2753/mis0742-1222300405	(Li et al., 2014)	Game complexity and familiarity are key cognitive-related game elements that shape user engagement. Lower game complexity and higher game familiarity resulted in stronger immersion and higher engagement.
		Whitton, N. (2010). Game Engagement Theory and Adult Learning. <i>Simulation & Gaming</i> , 42(5), 596-609. https://doi.org/10.1177/1046878110379587 (Original work published 2011)	(Whitton, 2010)	The article proposes a five-factor model of learning engagement: challenge, control, immersion, interest, and purpose . These are derived from game-engagement theory, flow theory, and adult learning principles to explain how well-designed games create deeper engagement and effective learning in higher education.
Wellness Apps		AiSlaity, A., Suruliraj, B., Oyebode, O., Fowles, J., Steeves, D., & Orji, R. (2022). Mobile applications for health and wellness: a systematic review. <i>Proceedings of the ACM on human-computer interaction</i> , 6(EICS), 1-29. https://dl.acm.org/doi/abs/10.1145/3534522	(AiSlaity et al., 2022)	The systematic review of 70 top-rated mobile health apps found that while categories like journaling and meditation dominate the market, the most effective apps consistently employ key behavior change strategies such as self-monitoring, personalization, reminders, task reduction, and clear instructions. Apps averaged 12 strategies each, but those using targeted, well-implemented techniques achieved higher user ratings and adoption, showing that quality of strategy use matters more than quantity. Underused features, like helping users plan for barriers or restructuring environments, also correlated with greater app success , suggesting opportunities for innovation. Overall, the findings emphasize designing mobile

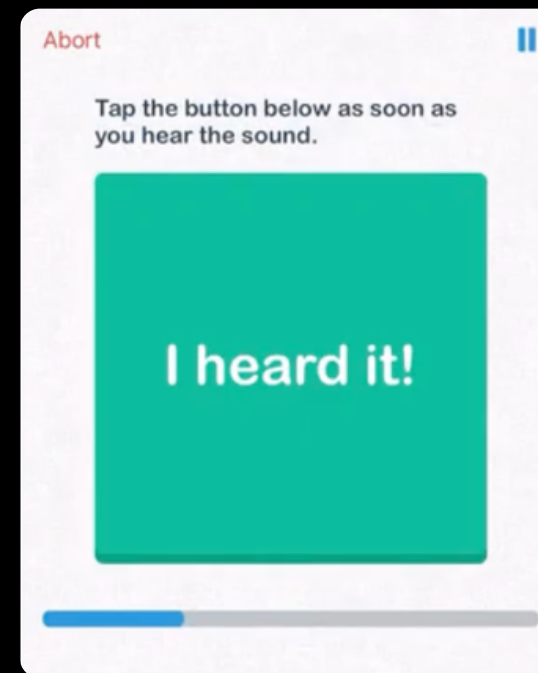
Comparative Analysis



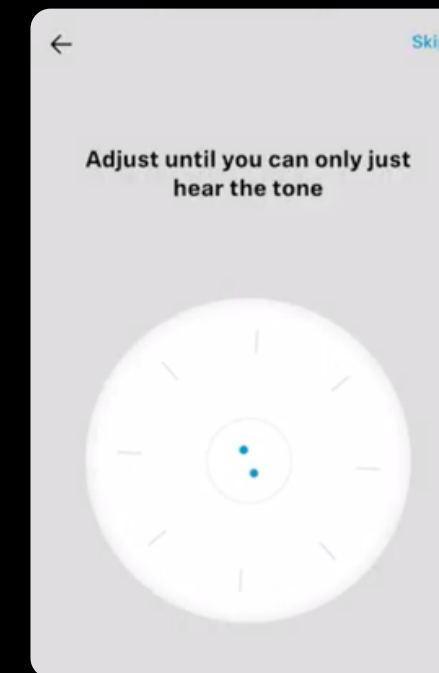
Identified competitors from three different sources to gather ideas:

- Provided by Dolby
- Apple Store
- Desktop

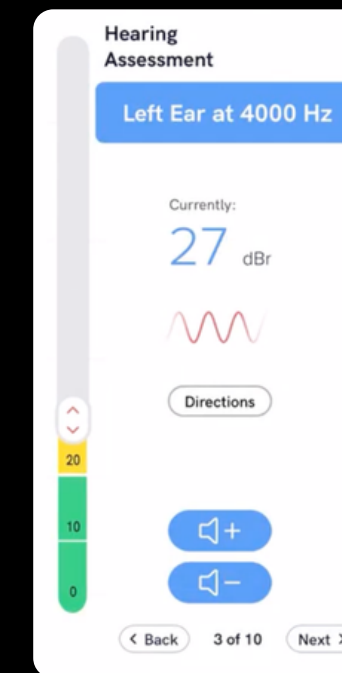
Explored strengths, weaknesses, and opportunities for our design process.



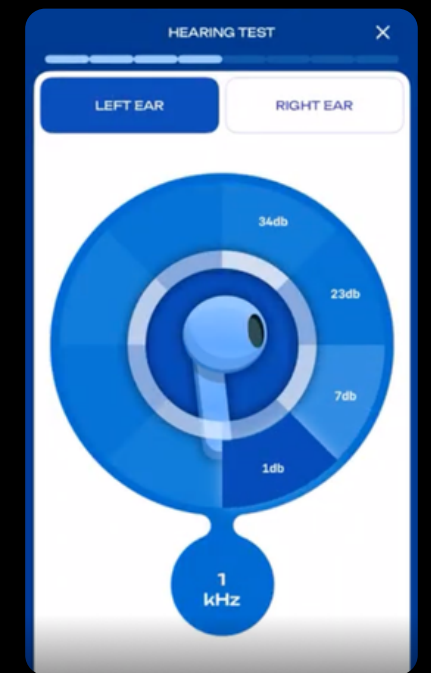
Hearing Test & Ear Age



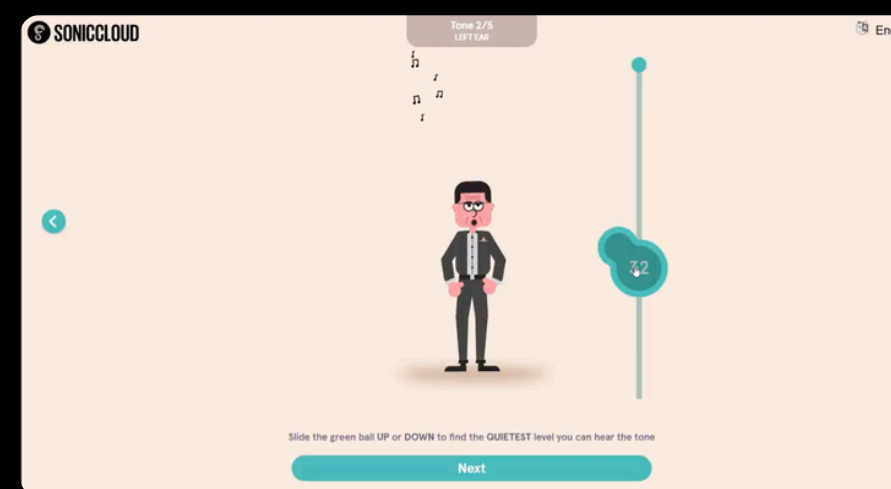
Sennheiser



AudioCardio



Control Time



Sonncloud



Sound Scouts

Comparative Analysis



Pause buttons or other self-pacing tools



Enforces quiet environment with reminders or barriers



Simple instructions



Simple test results & access to history



Estimates of test length



Comparative Analysis



Frequencies are played without pausing



Frequencies are played in a predictable pattern



Limited range of frequencies to test



Primary Research

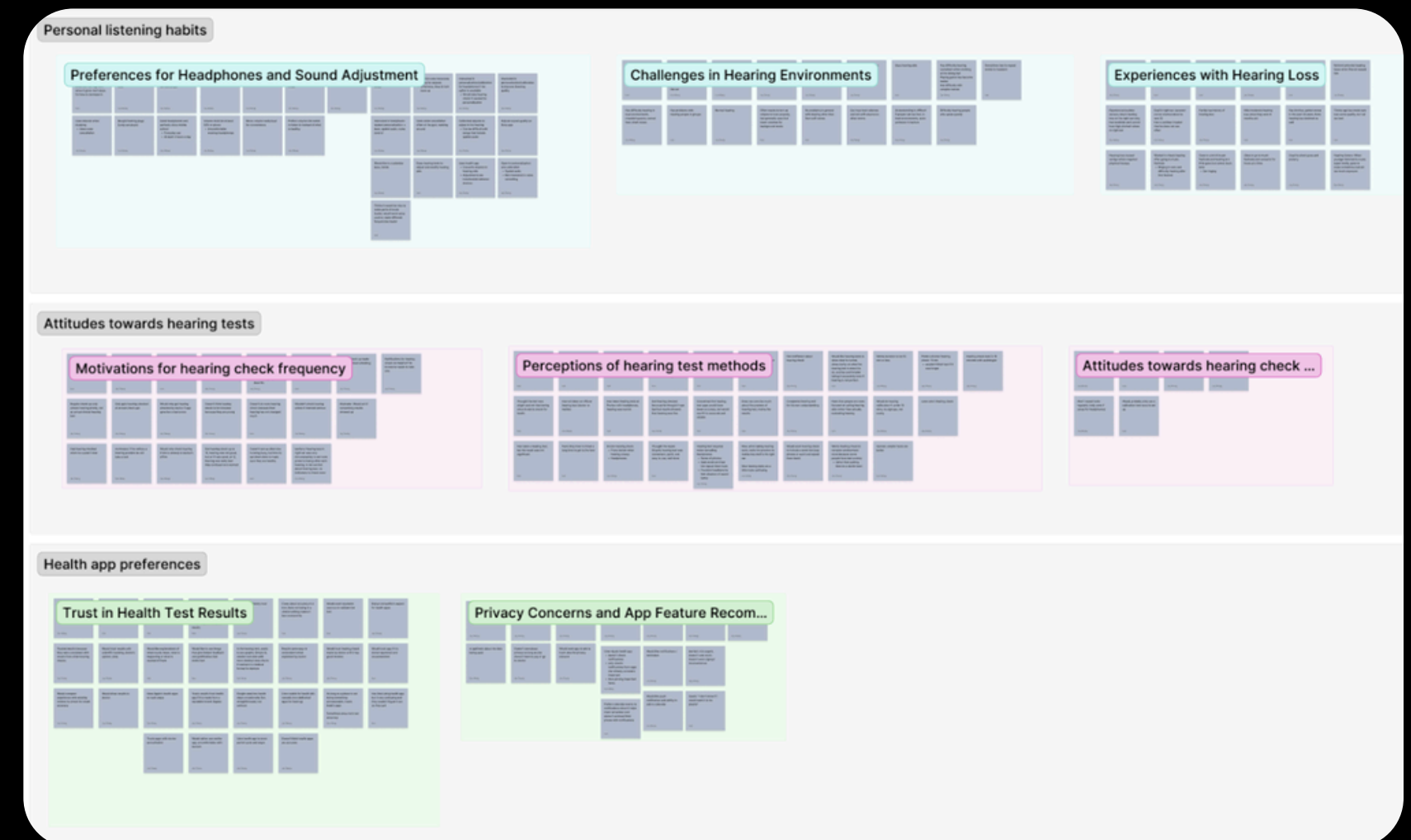


Interviewed 17 users from the ages of 17-74 to see their current thoughts on:

- Audiology
- Gamification
- Hearing test experiences

KEY INSIGHTS

- Users prioritize volume over health
- Preference for quick, verified tests
- Personalized feedback and progress tracking



Shift in Focus



After gaining a foundational understanding of the hearing check space, we found that...

most users are unconcerned with checking their hearing health frequently.



Rather than design an app most people won't use, we addressed why users should use our app by designing...

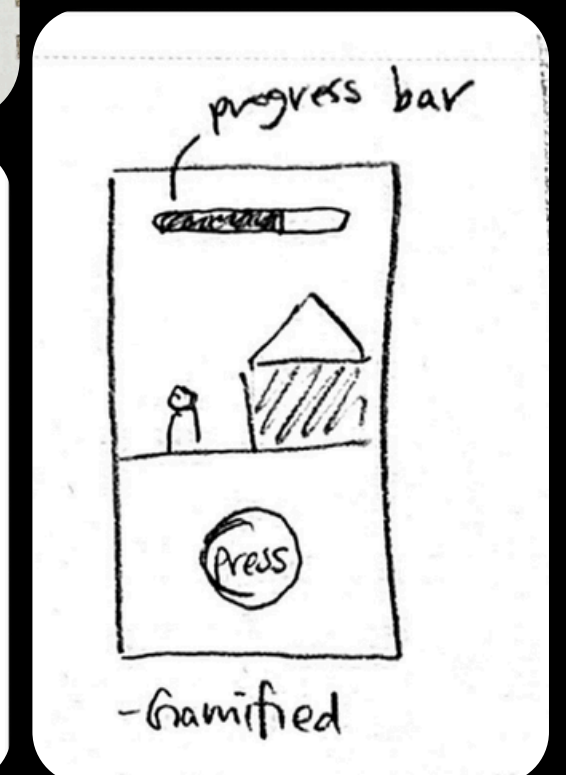
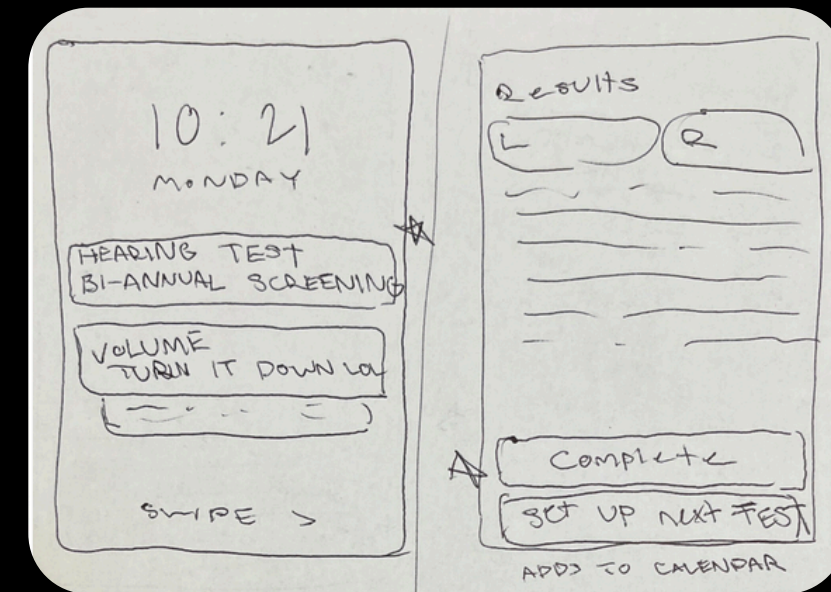
an audio calibration app enhancing users' listening experience to their needs by adjusting hearing levels.



Key Features



- Test demo
- Progress bar
- Captions for instructions
- Result history
- Notifications
- Export feature





User Journey

ONBOARDING

- Sign-up/Profile Creation
- User is instructed on how to complete the hearing test process

TEST

- User goes to a quiet, secluded room
- Tests various frequencies and decibels

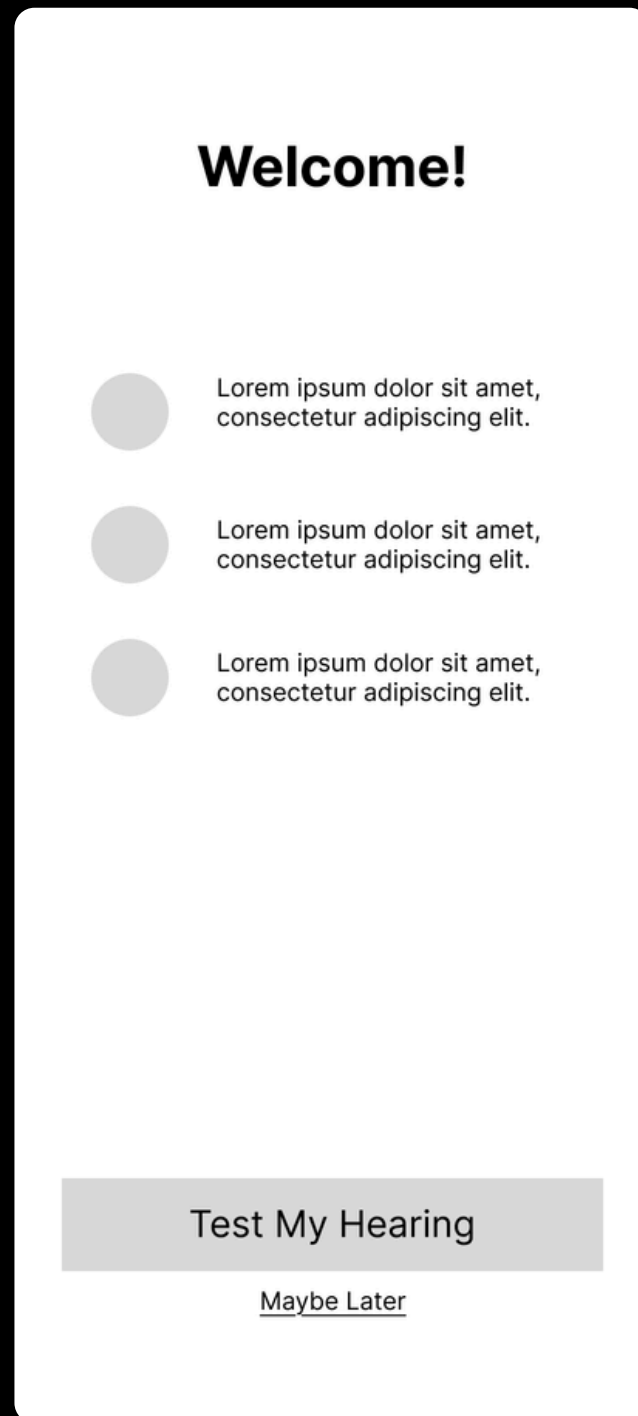
OFFBOARDING

- Personalized results are explained
- Audio is automatically calibrated tailored to personal result

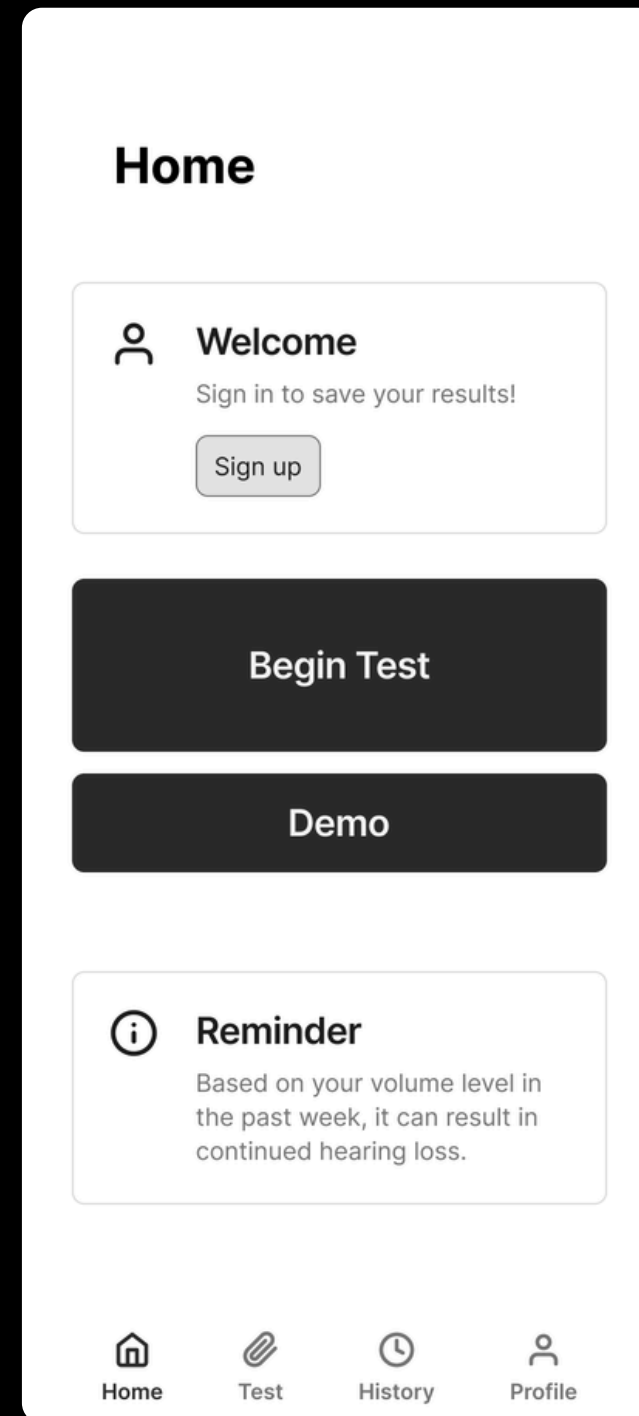
Home (Lo-fi)



Test education

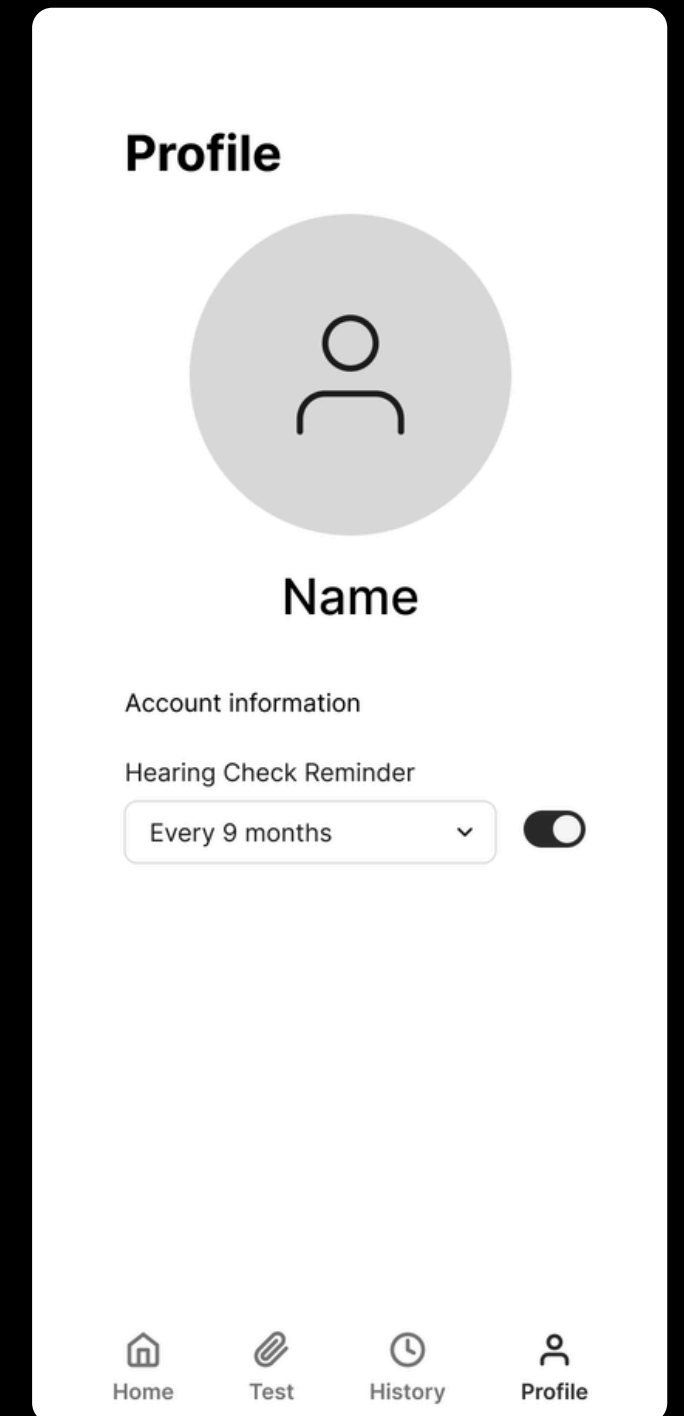


Save Results



Hearing Health Warnings

Reminders to take test again



Immediate test access

Results (Lo-fi)



Show Benefits

Personalize your results

- Lorem ipsum dolor sit amet consectetur. Tempor habitasse ullamcorper nulla eget. Eu netus dignissim nibh purus nullam.
- Lorem ipsum dolor sit amet consectetur. Tempor habitasse ullamcorper nulla eget. Eu netus dignissim nibh purus nullam.
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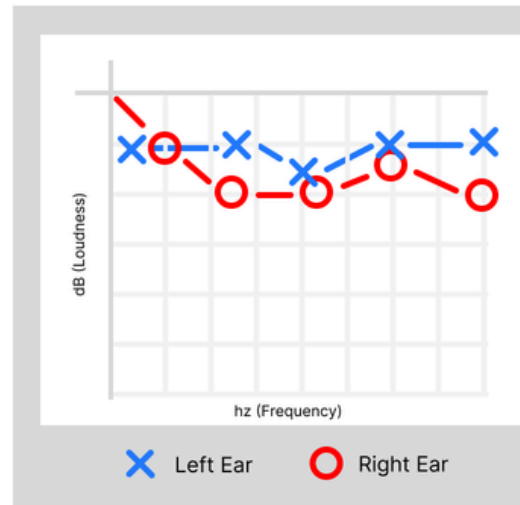
Personalize

[Maybe Later](#)

Audiogram

Results

No Hearing Loss



You hear better than X of Y

Lorem ipsum dolor sit amet consectetur. Turpis porttitor adipiscing donec libero nulla tellus lorem aliquam velit. Turpis porttitor adipiscing donec .

Because you wear headphones

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Other personalized information

Personalized Results

Hear Calibration Changes

Calibration



Your headphones are calibrated!

Hear the difference



Before

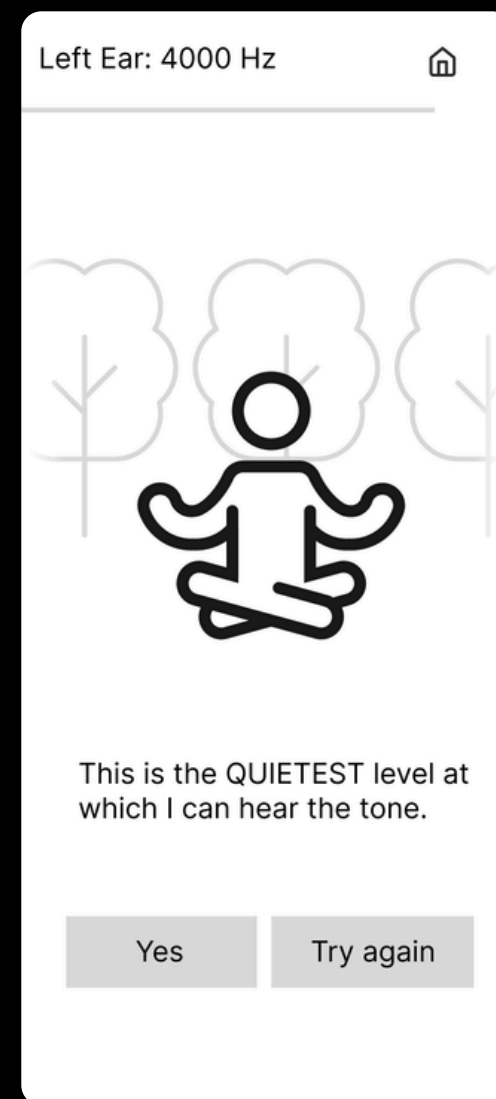
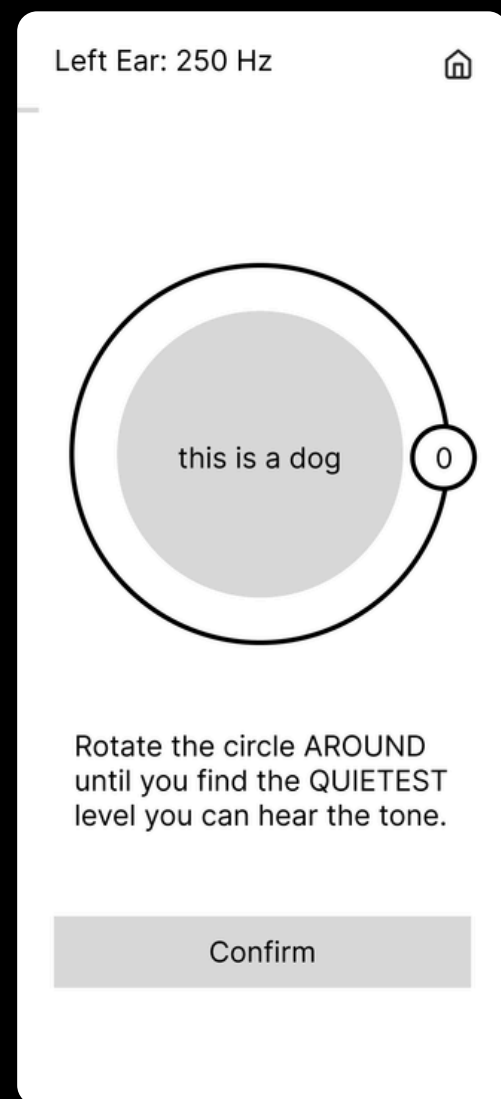


Now

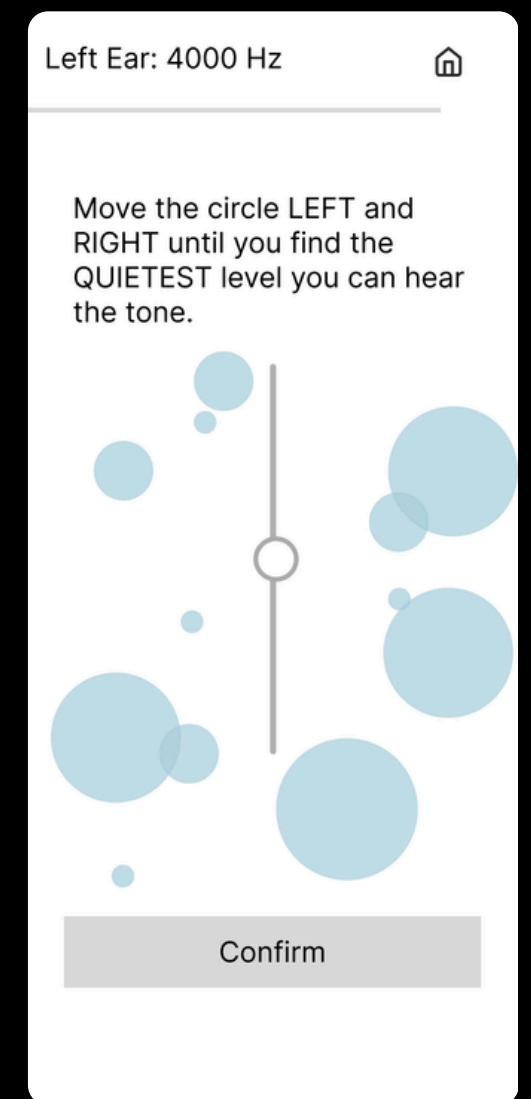
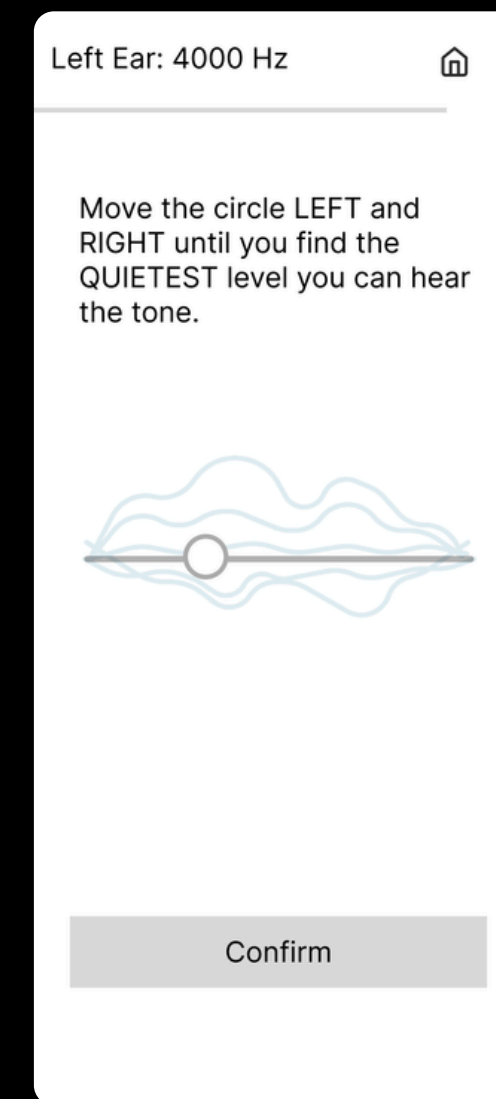
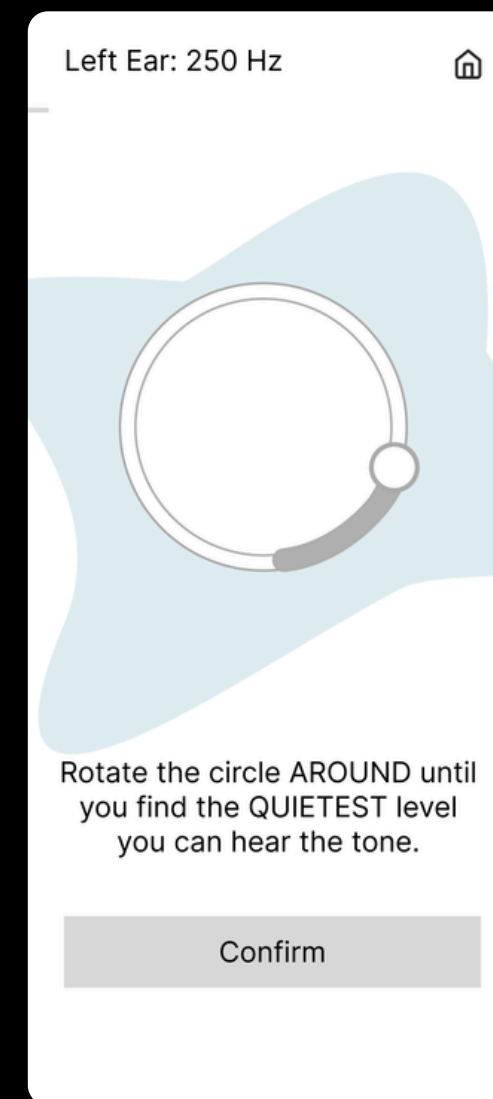
Sounds Good!

Concepts: Testing Page

Concept A - Storytelling



Concept B - Abstract



Concepts: Testing Page

Concept A - Storytelling/Minigames

- Fun, game-like, and motivating
- Easy to follow once the story flow was understood

- May slow them down because they wanted to watch animations
- Changes in visuals might be too abrupt

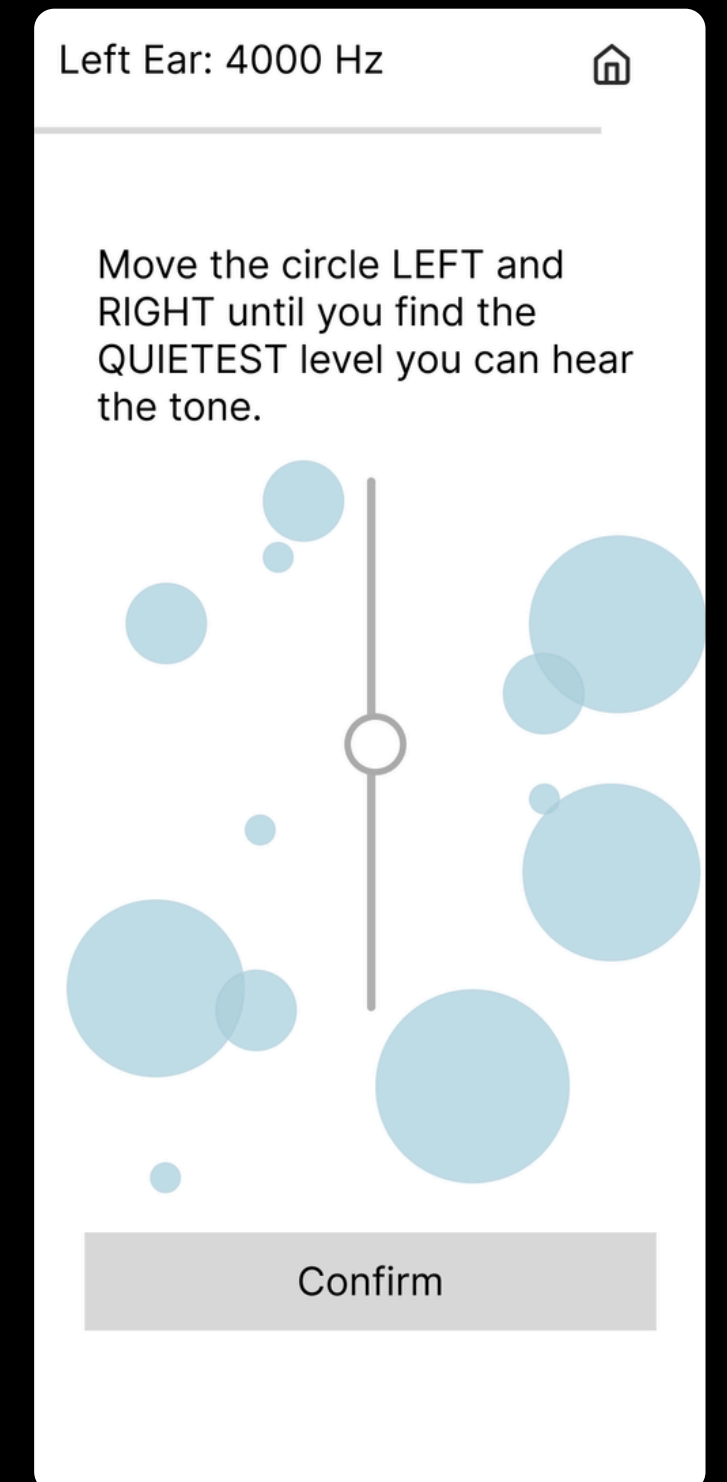


Concepts: Testing Page

Concept B - Abstract Visuals

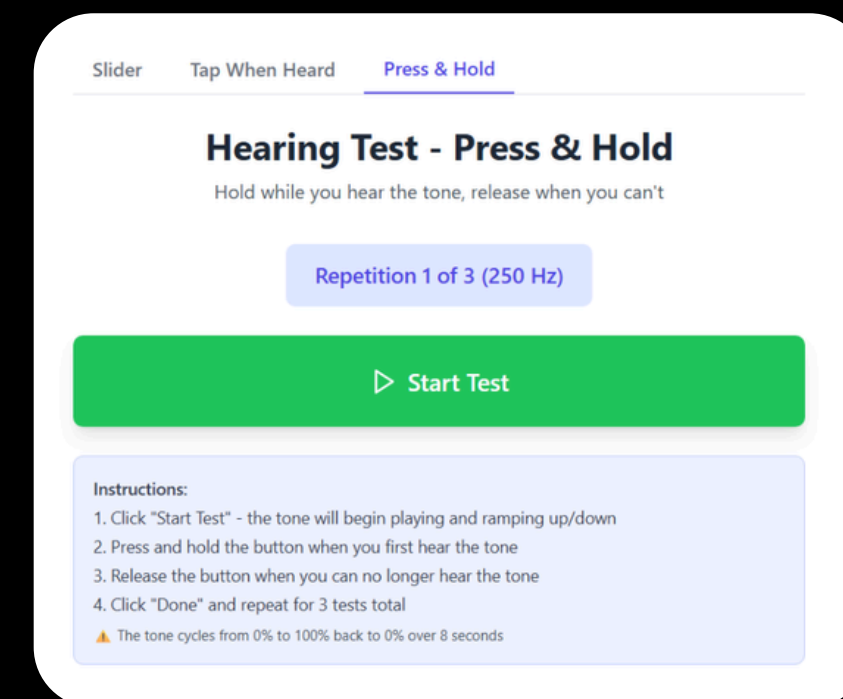
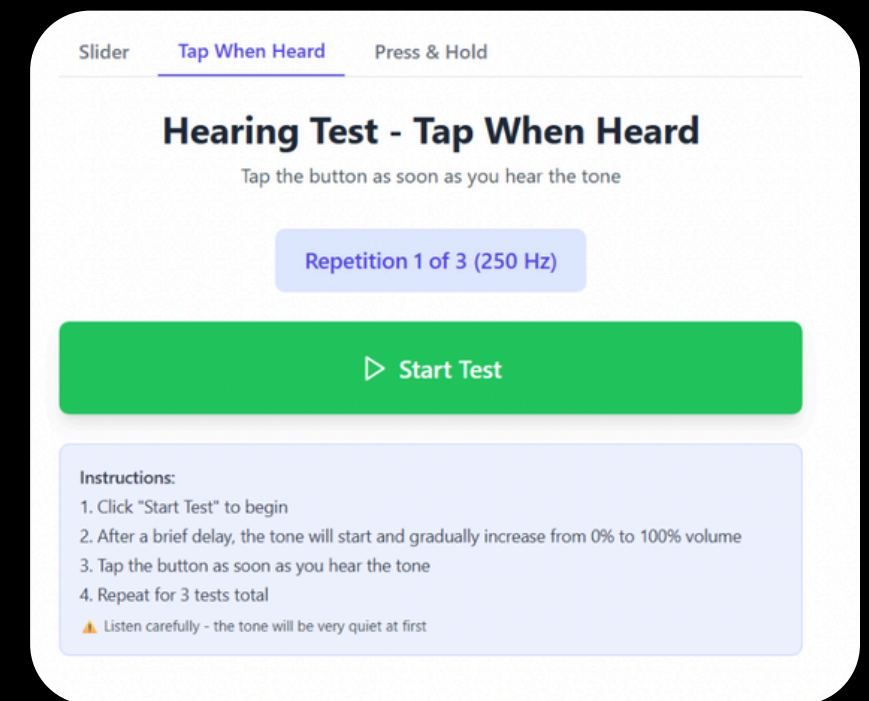
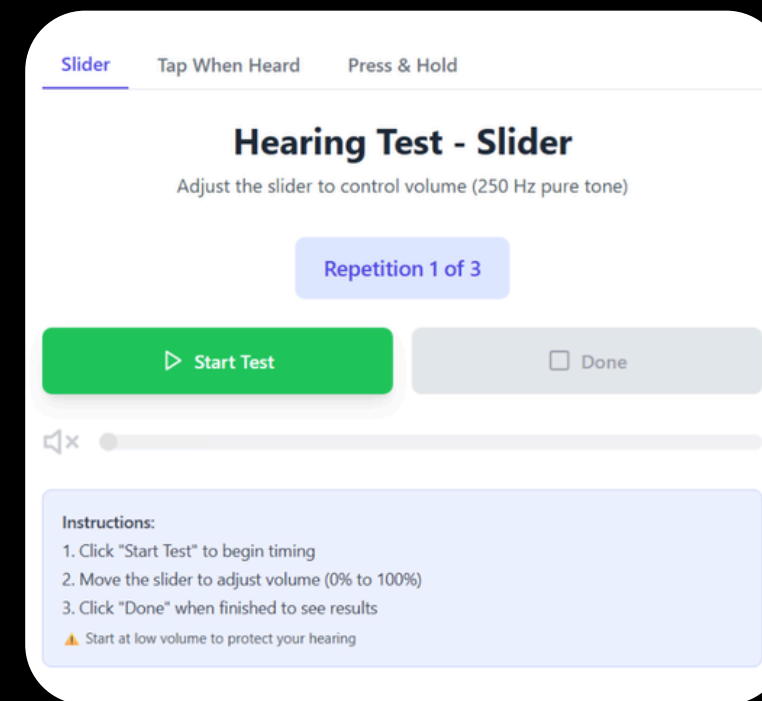
- Described as futuristic, clean, or calming
- Easier for users who prefer minimal visuals or less “narrative”

- Several users found the meaning of the visuals unclear
- Struggled to see how abstract visuals related to the hearing test purpose



Testing Interactive Methods

- Tested with 8 participants from prior interviews
- Used Claude AI to make **interactive dashboard**
- **Tasks**
 - Tested **engagement time**, measuring without visuals to isolate interaction performance
 - Collected **feedback on enjoyment** using a rating scale.



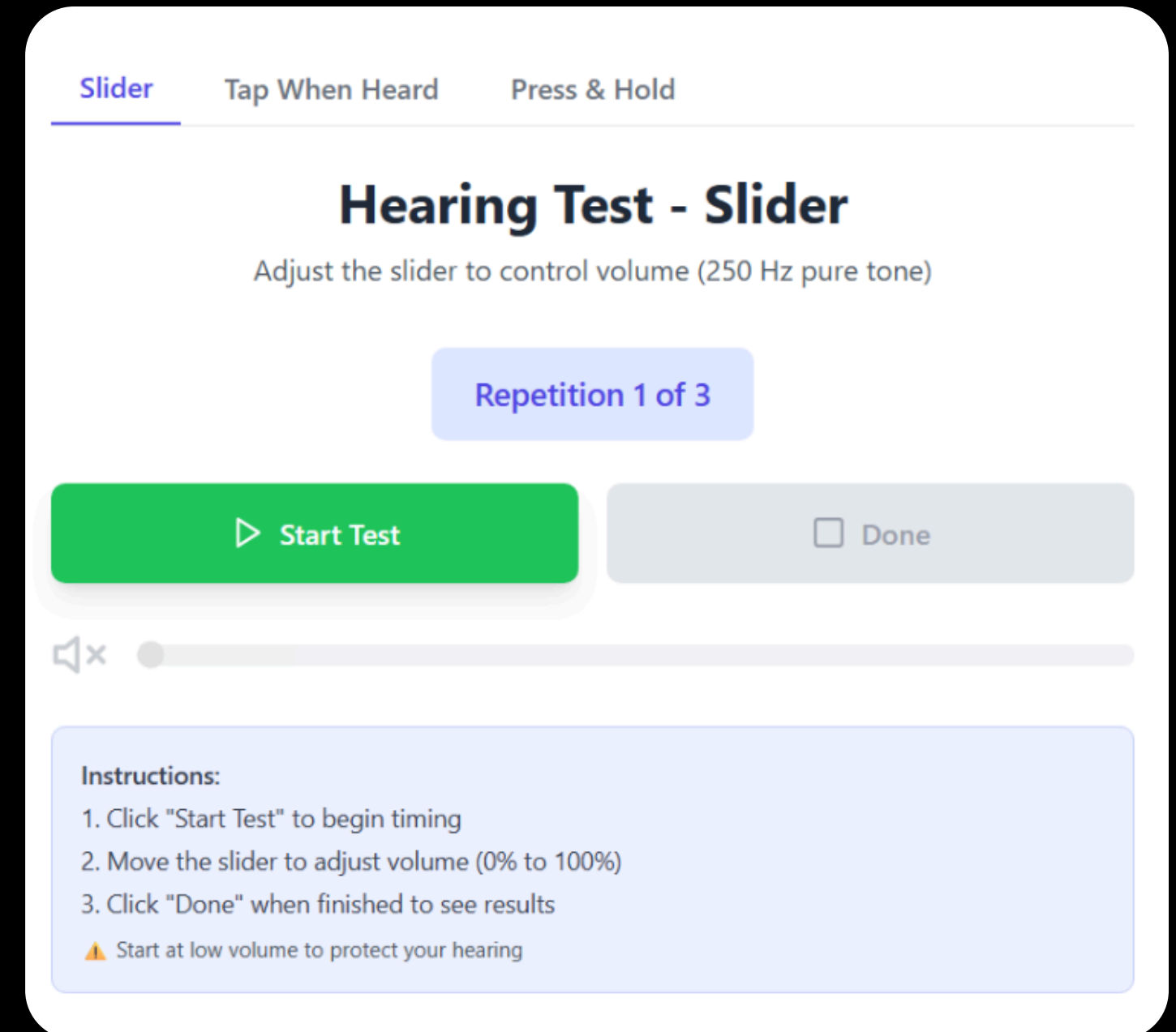
Concepts: Interaction



Slider

- Users felt more in control
- Can give more accurate results due to the precise interaction

- Hard to identify the exact threshold



Concepts: Interaction



Tap-When-Heard

- Quick test
- Reduces overthinking results



- Reaction time affects accuracy
- Higher chance of misclicking
- Couldn't undo an incorrect tap



Slider Tap When Heard Press & Hold

Hearing Test - Tap When Heard

Tap the button as soon as you hear the tone

Repetition 1 of 3 (250 Hz)

▶ Start Test

Instructions:

1. Click "Start Test" to begin
2. After a brief delay, the tone will start and gradually increase from 0% to 100% volume
3. Tap the button as soon as you hear the tone
4. Repeat for 3 tests total

⚠ Listen carefully - the tone will be very quiet at first

Concepts: Interaction

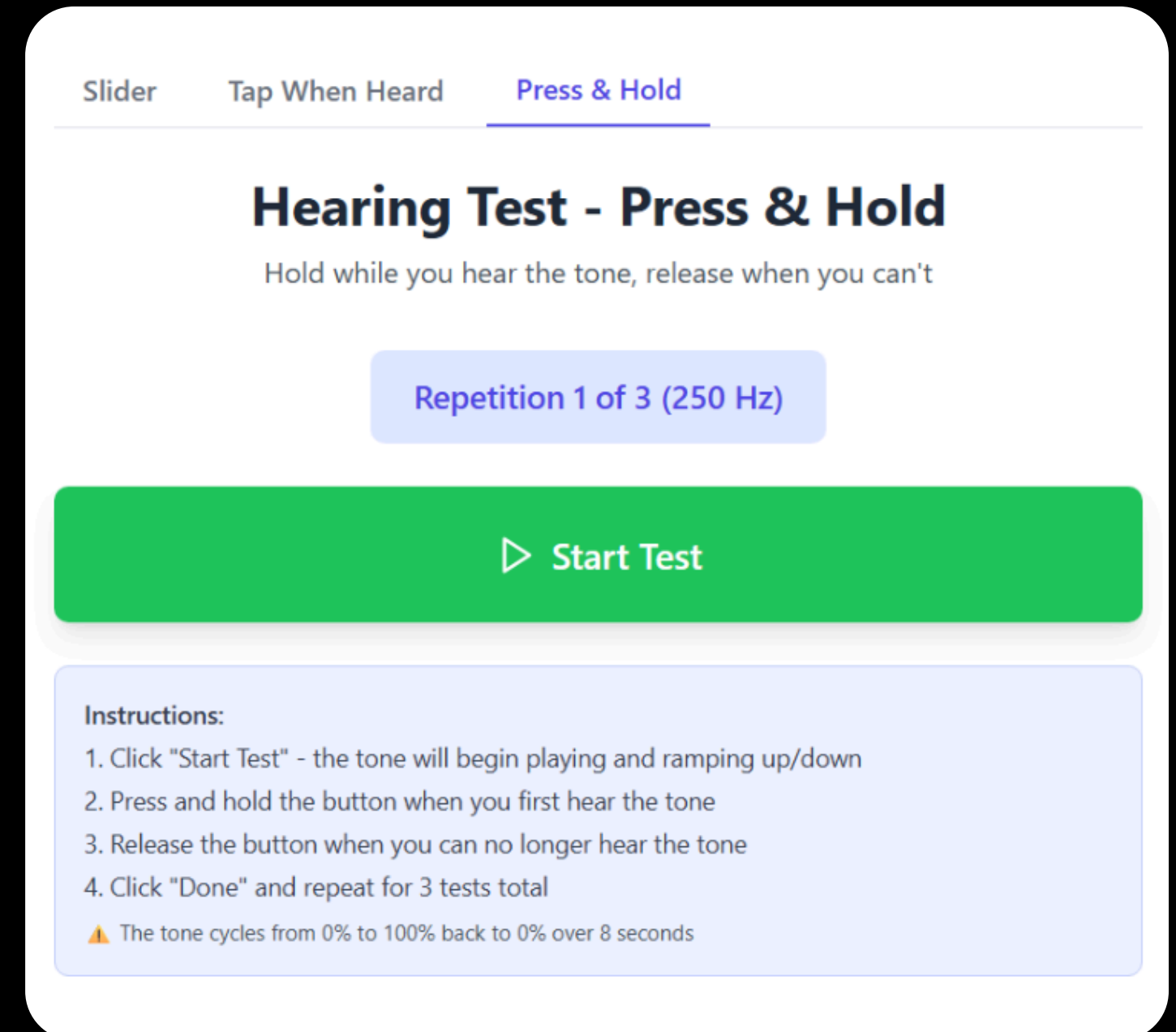


Press-and-Hold

- Users liked “one-shot” concept
- Quick and efficient test



- Can't work for users who have slow reflexes
- Uncertainty about when exactly the tone disappears



Final Concepts



Visuals - Storytelling/Minigames

- 5/7 users preferred storytelling over abstract visuals
- Assists in engagement and navigating the user flow



Interaction - Slider

- Slider interaction felt more user-friendly
- Not based on reaction speed which reduced testing anxiety





High-fidelity Prototypes

How can we elevate our prototype into a **functional and visually pleasing** experience?

Who is Our User?



Meet **Mark!**

- Avid concert attendee
- Self-proclaimed audiophile
- Aware of potential lifestyle-induced hearing damage

Mark wants to:

- Test for any potential hearing loss
- Keep track of his hearing habits
- Improve his audio listening experience



How would Mark Learn of the App?

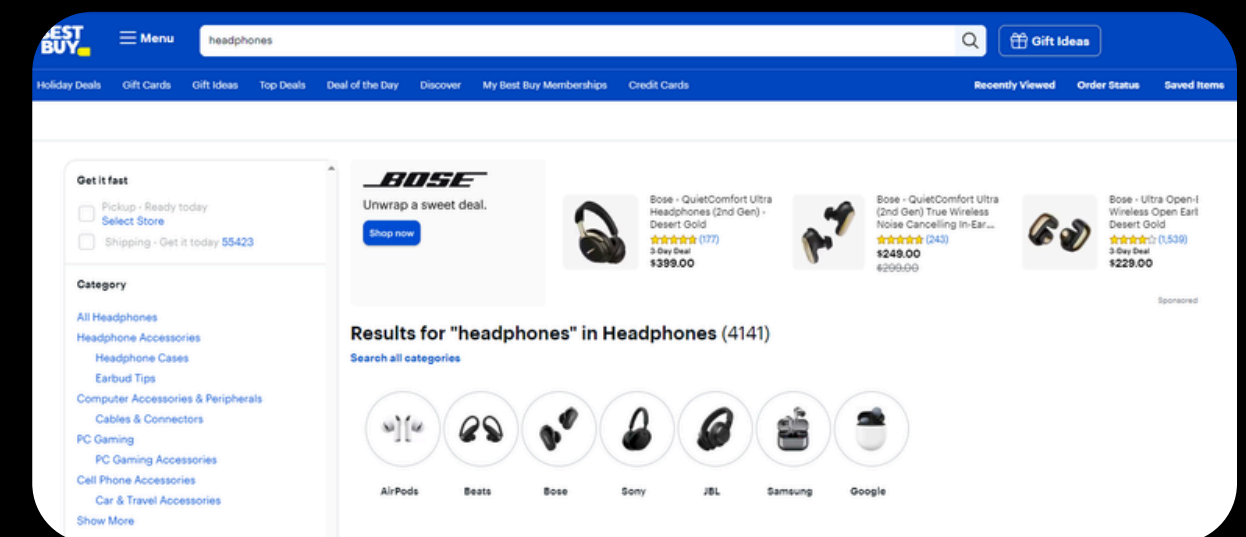


Community Forums (e.g. Reddit)

- Concertgoers
- Music listeners/audiophiles
- Hearing loss patients

Associated Platforms

- Audio equipment retailers
- Ticketmaster, StubHub, etc.
- Health apps/websites



Onboarding

1. Welcome

2. Home

3. Sign-up/ Log-In



Welcome to Dolby Calibration



Check your hearing

Take tests to check your hearing health



Track your habits

Stay aware of your listening habits



Calibrate your devices

Use hearing test results to calibrate your personal audio devices

GET CALIBRATED

[Maybe Later](#)

Onboarding

1. Welcome

2. Home

3. Sign-up/ Log-In



Home



Welcome

Sign in to save your results!

Sign up



Reminder

Your volume level in the past week has been at dangerous levels, continued listening at this level for 1 hr. or more can result in hearing loss.

Demo

Begin Test



Home



Test



History



Profile

Home

Welcome Back, Mark!



You are currently listening to your calibrated audio!



Reminder

Your volume level in the past week has been at dangerous levels, continued listening at this level for 1 hr. or more can result in hearing loss.

Demo

Begin Test



Home



Test



History



Profile

Onboarding

1. Welcome

2. Home

3. Sign-up/ Log-In



← ×

Create Your Account

Name

Email

Password

Re-enter Password

Birthday

Day Month Year

Gender

I agree to the [Terms and Service](#)

SIGN UP

← ×

Sign Into Your Account

Email

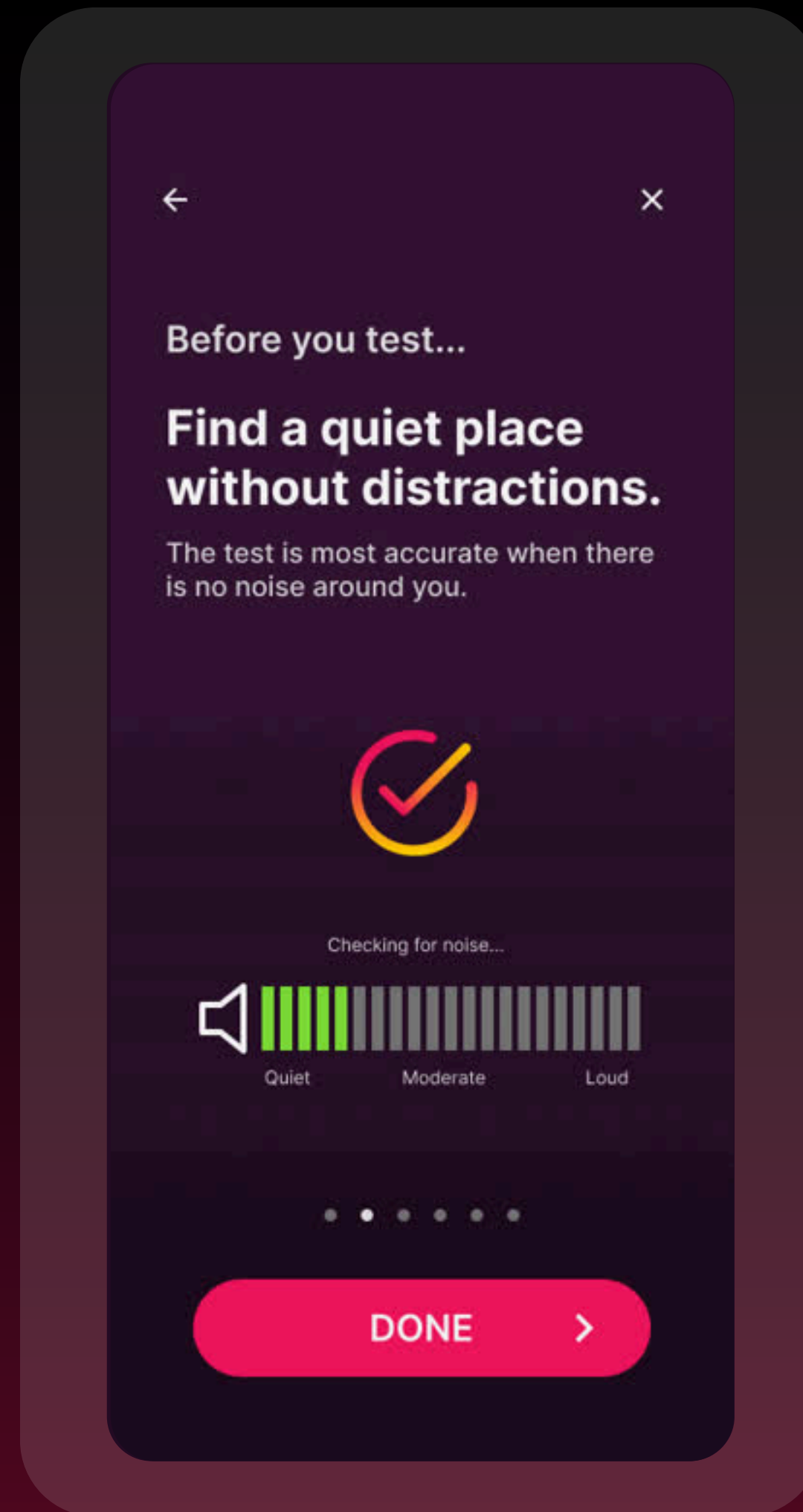
Password

[Forgot Password?](#)

SIGN UP

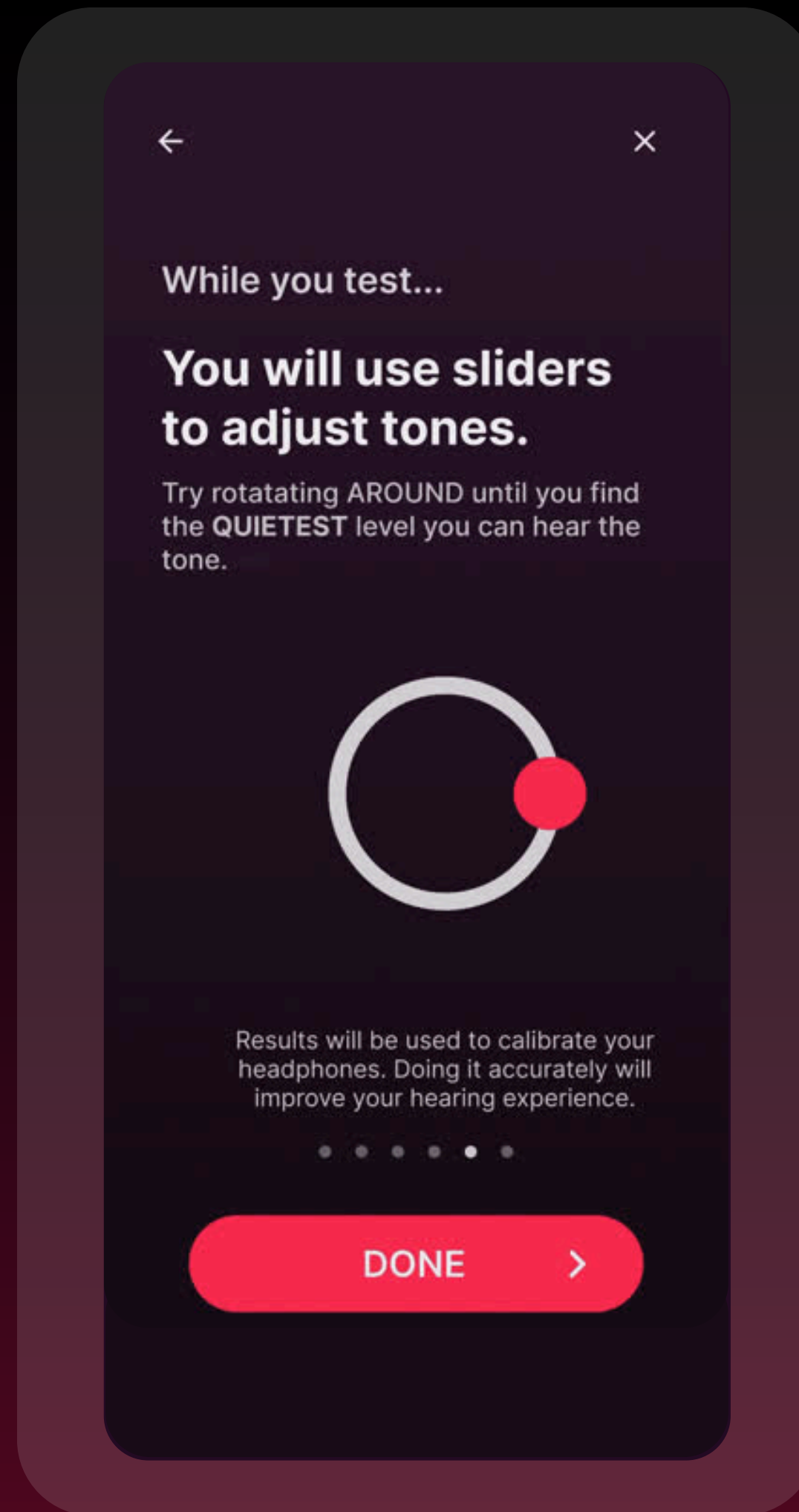
Testing

1. Pre-testing instructions
2. Watch Demo
3. Take Test



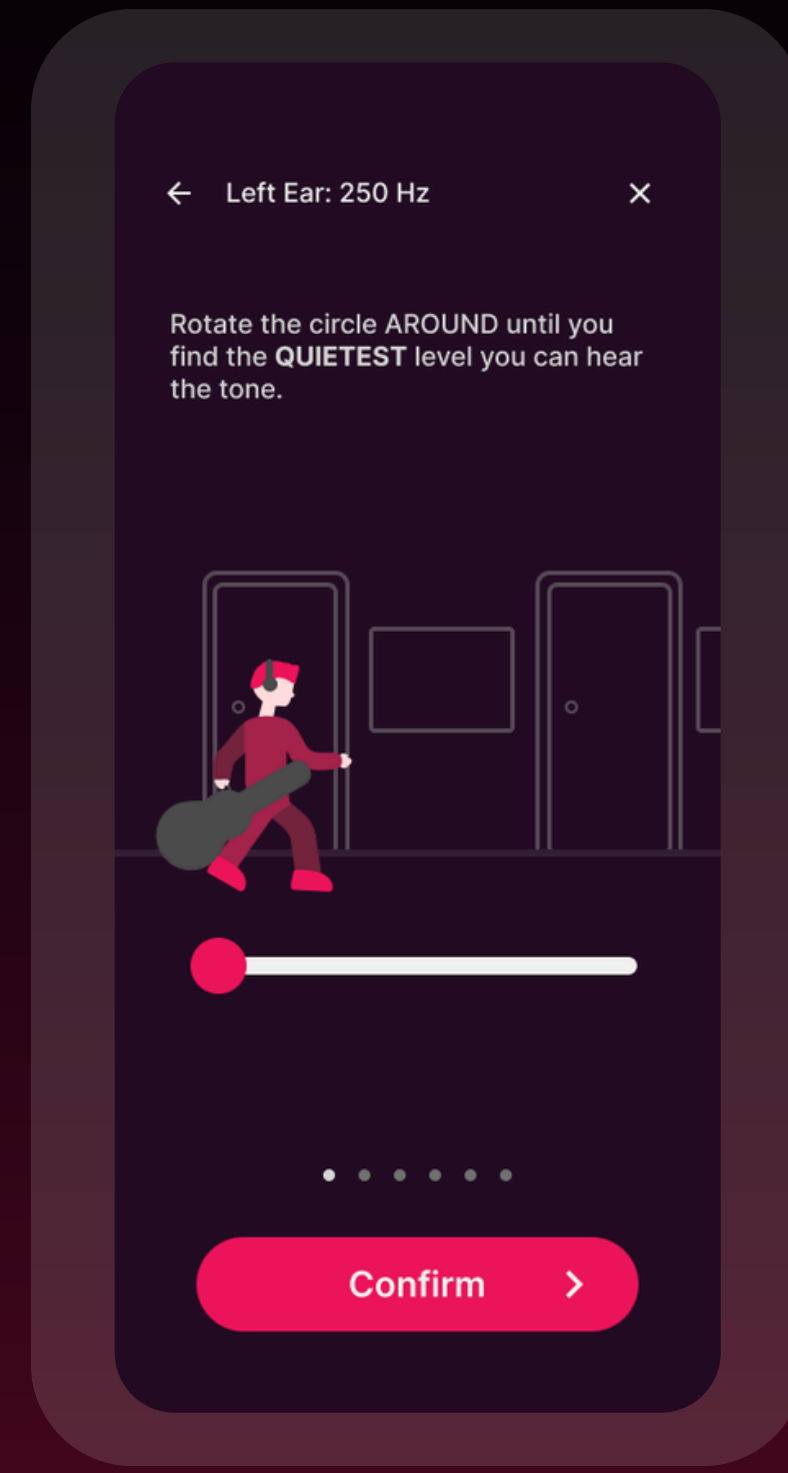
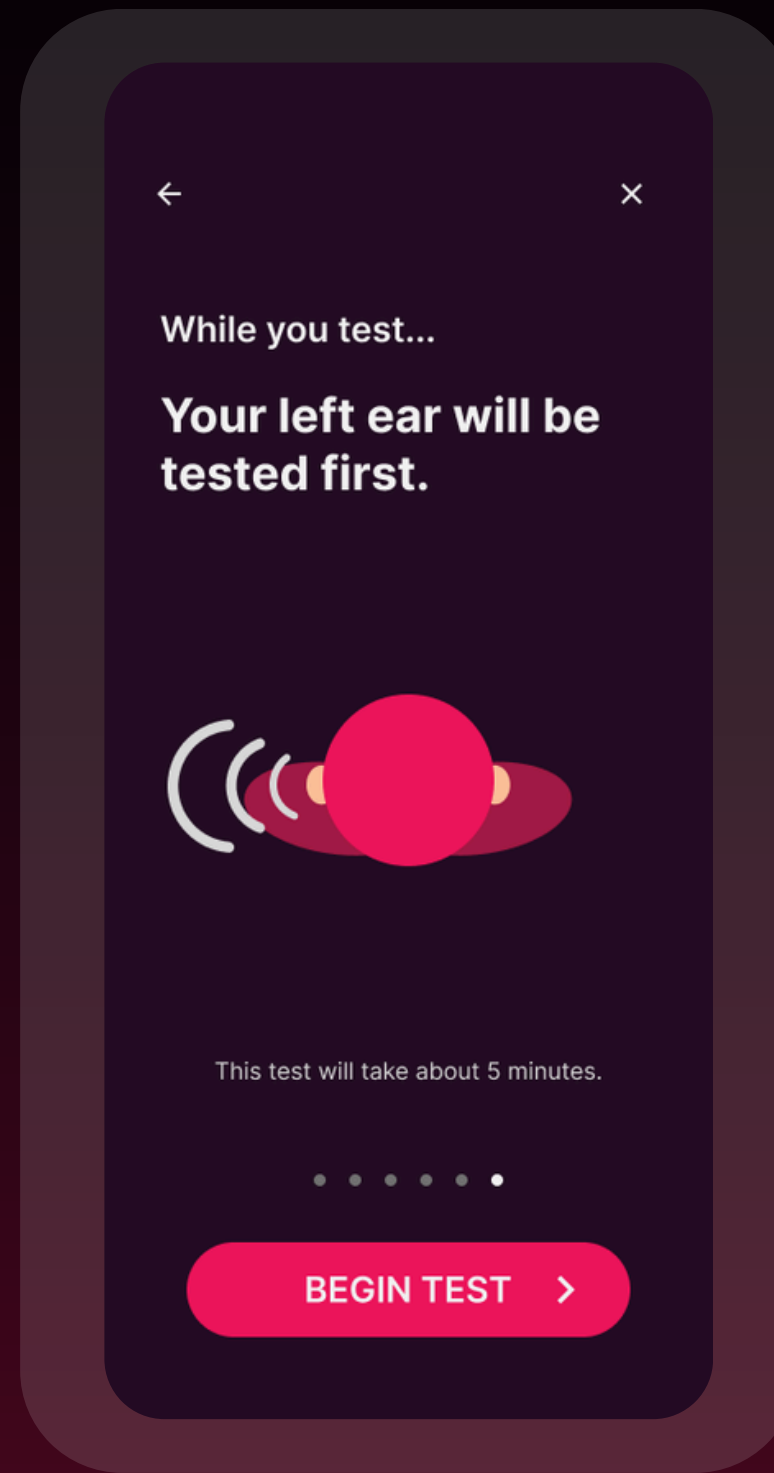
Testing

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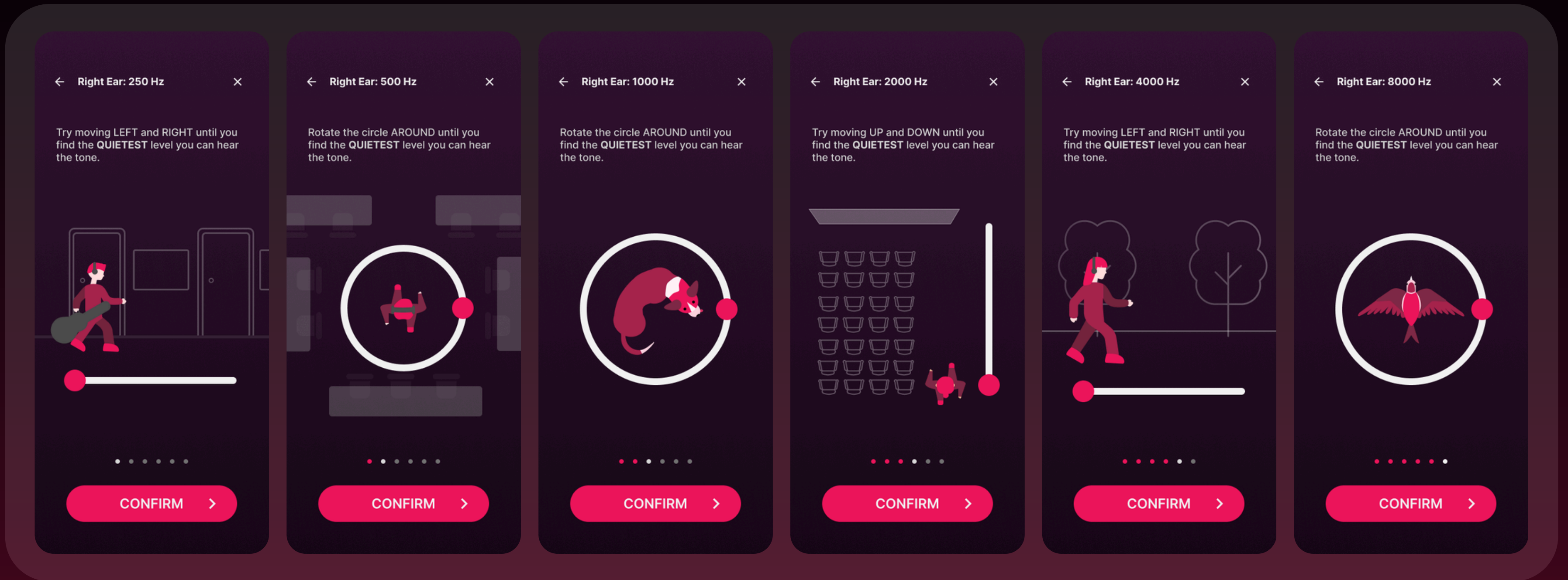


Testing

1. Pre-testing instructions
2. Watch Demo
3. Take Test



Testing: Animated Scenarios



Offboarding

1. Personalizing your results

2. Analyzing your results

3. Calibrating headphones

4. Reviewing history



Personalize Your Test Results



Take care of your hearing

Personalizing your test results can prevent further hearing damage



Receive personalized hearing advice

Get tips on how to practice safe listening in your daily life



Track your habits

Stay aware of your listening habits



See demographic stats

Learn how your hearing health compares to other people your age

BEGIN >

[Maybe Later](#)



Questionnaire

What's your sex?

- Male
- Female
- Other
- Prefer not to say

Do you frequently engage in any of these activities?

- Work with loud machinery, appliances, and/or power tools
- Listening to loud music
- Riding in loud vehicles (airplanes, motorcycles, snowmobiles, etc.)
- Handling firearms or explosive tools

SUBMIT >

Offboarding

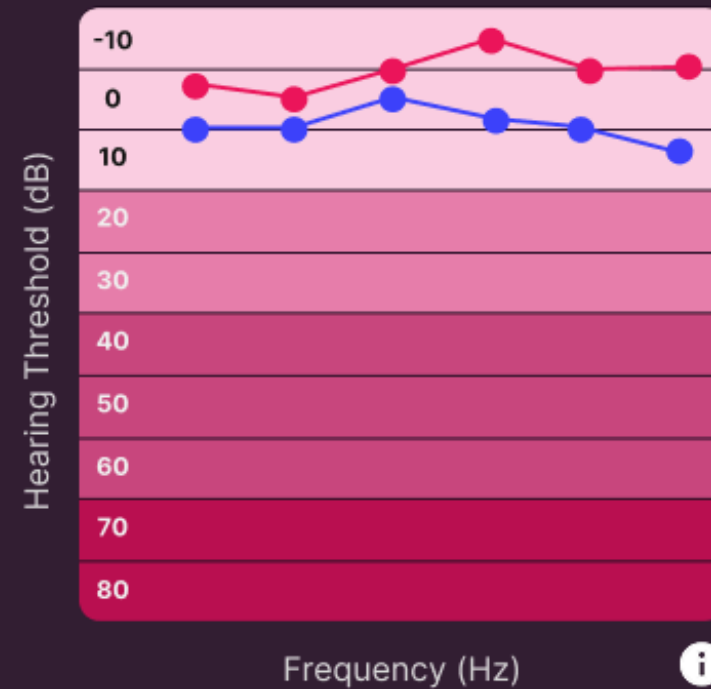
1. Personalizing your results
2. Analyzing your results
3. Calibrating headphones
4. Reviewing history



Your Results

No Hearing Loss

● Left Ear ● Right Ear



About your test



These test results indicate that your hearing abilities are at normal levels. Your left ear (40-50 dB) has is 5 dB better than your right ear.

You hear better than 15% of the population



These test results indicate that your hearing abilities are at normal levels. Your left ear has a range of 40-50 dB which is 5 dB better than your right ear.

Tips for your hearing health



1. Lower your headphone volume by 15%
2. Because you go to concerts, bring along ear plugs for safer enjoyment
3. Reduce headphone usage to 3 hours a day.

Calibration Adjustments

Right Ear

This test indicates that your Right Ear has lower hearing thresholds than your Left Ear.

Right Ear volumes will be increased.

Low Frequencies

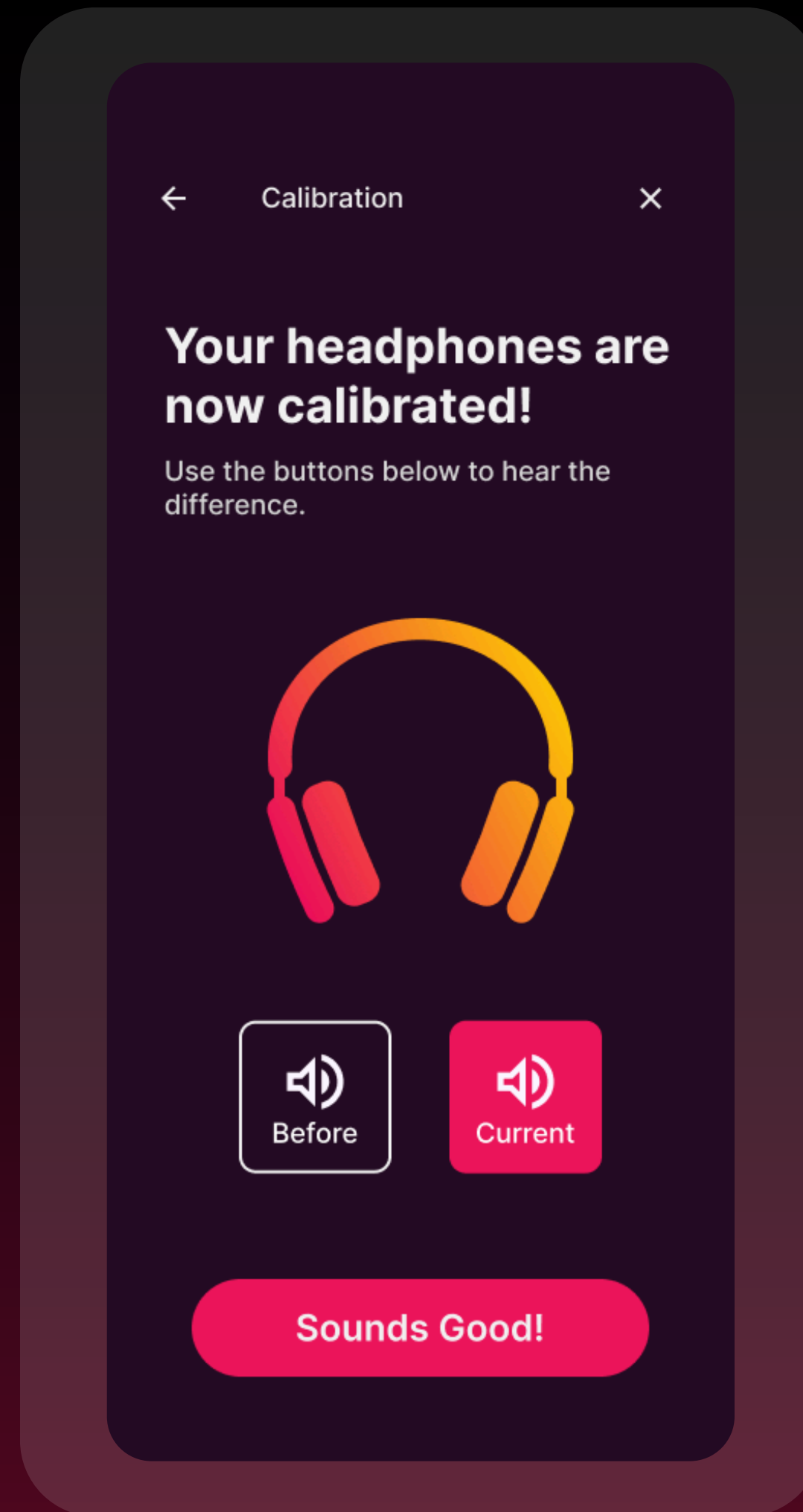
This test indicates lower hearing thresholds for Low Frequencies, such as bass or low-mid sounds.

Low Frequencies' volumes will be increased.

[Calibrate Audio >](#)

Offboarding

1. Personalizing your results
2. Analyzing your results
3. Calibrating headphones
4. Reviewing history



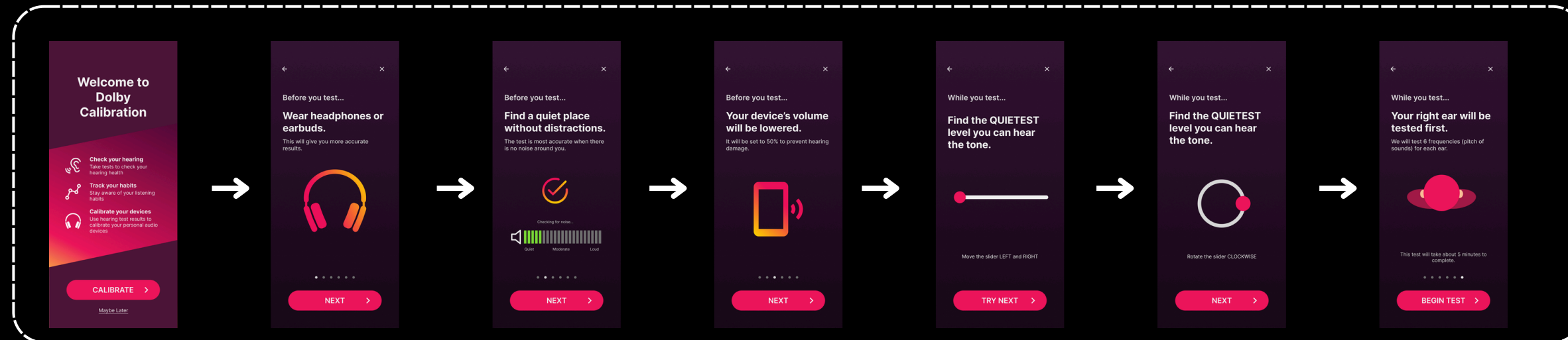
Offboarding

1. Personalizing your results
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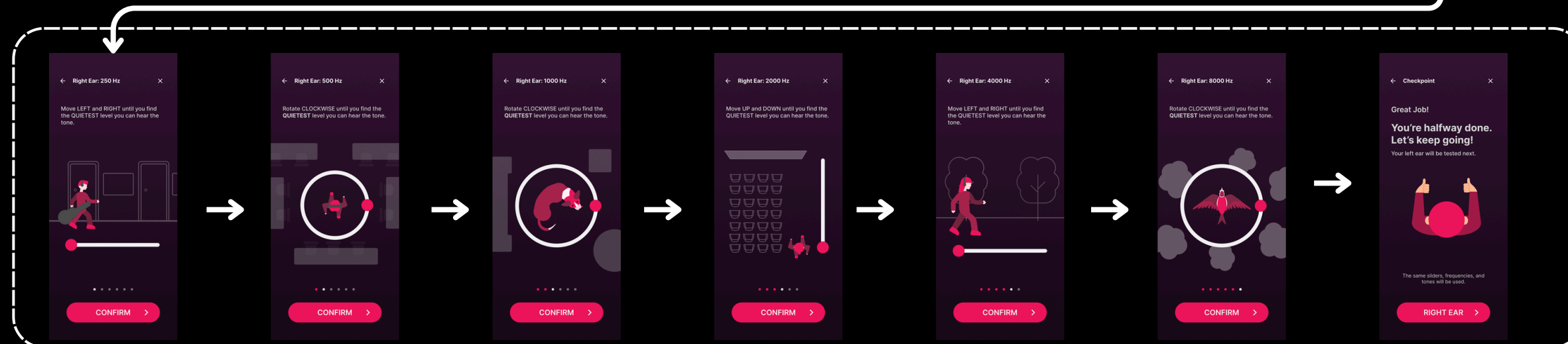
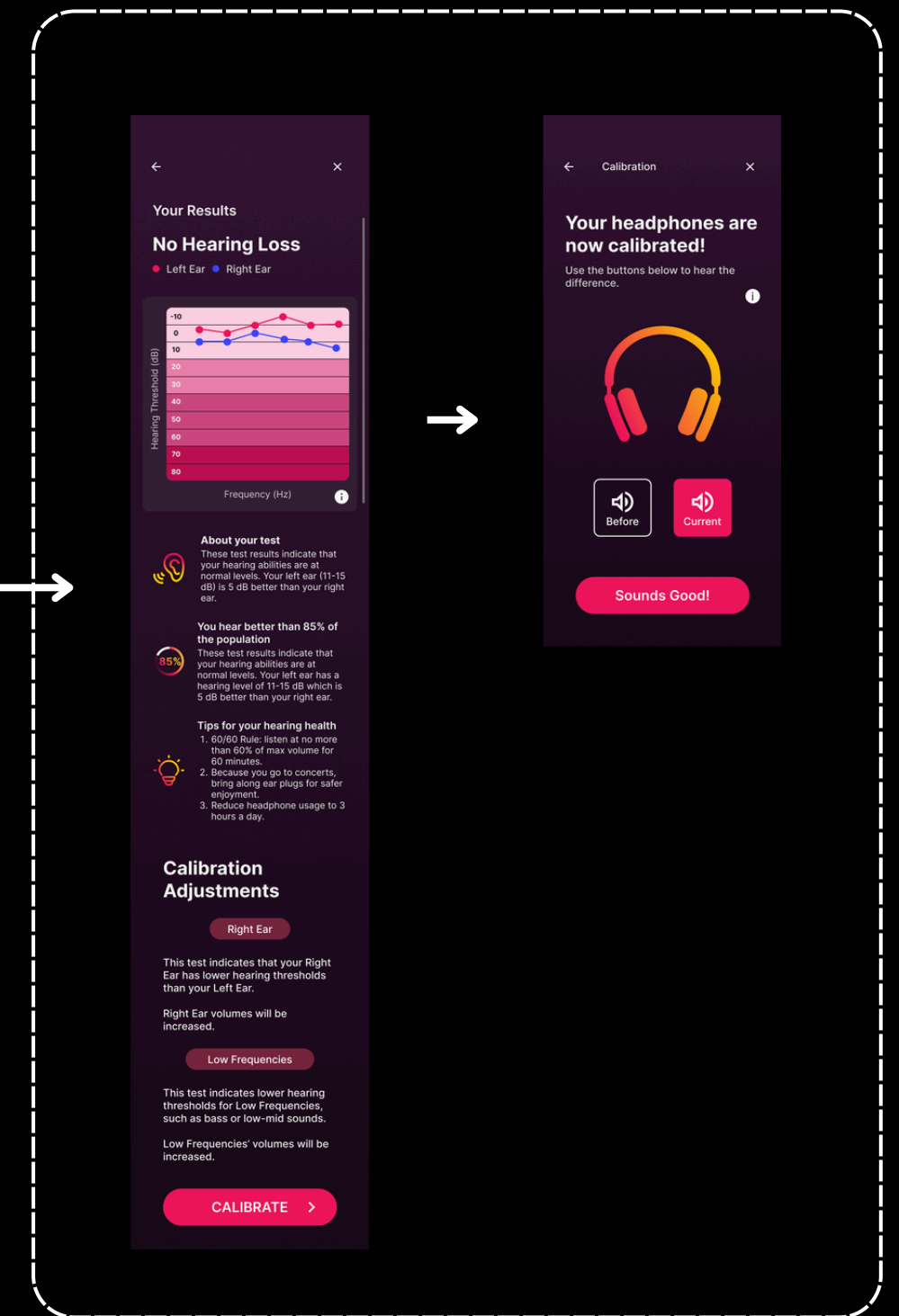


Ideal User Flow

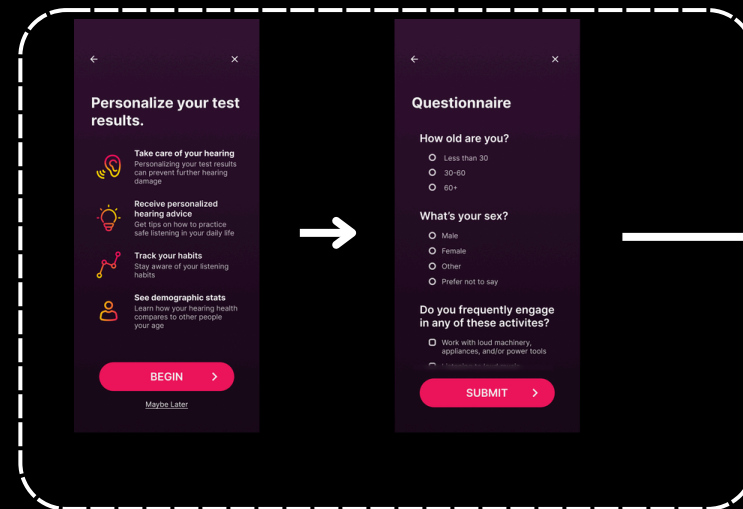
Onboarding and pre-test



Results

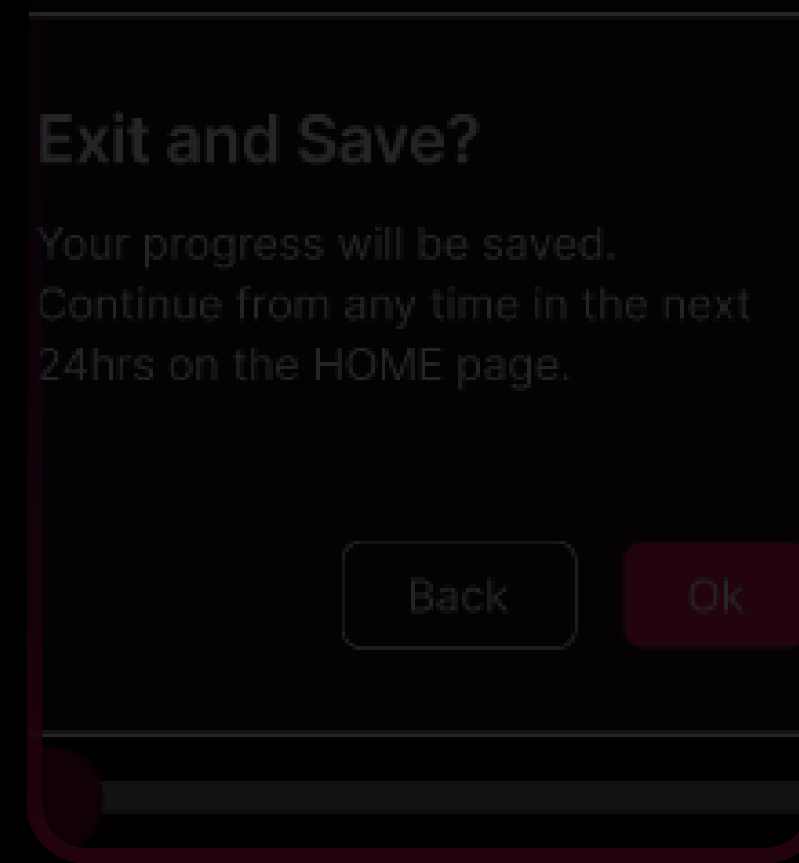
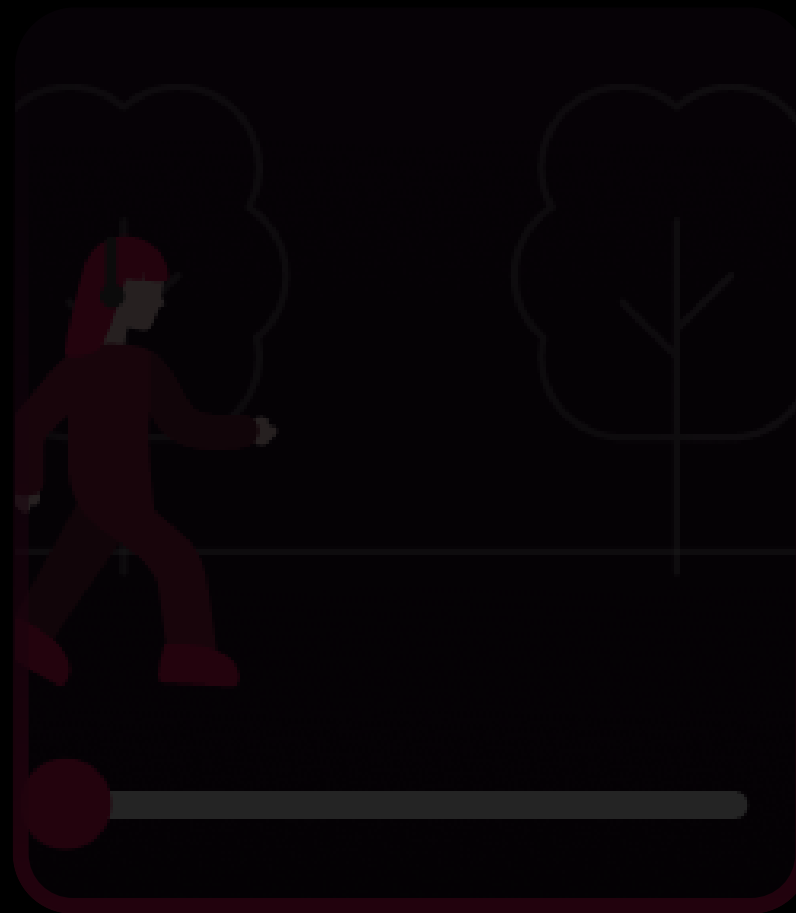
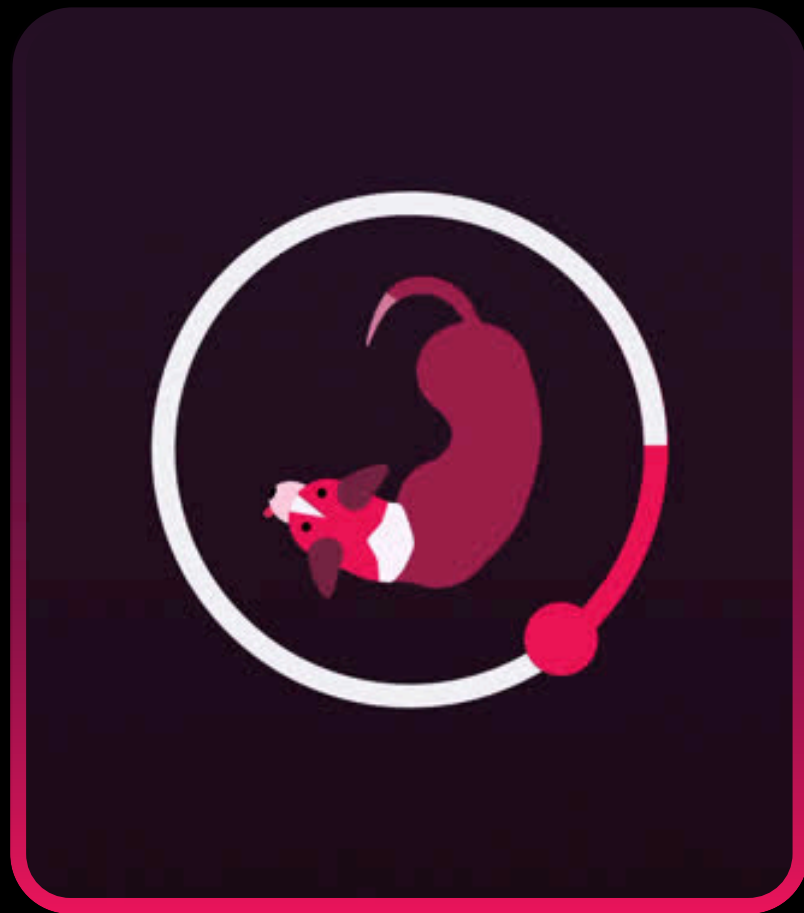


Testing screens x2 (each ear)



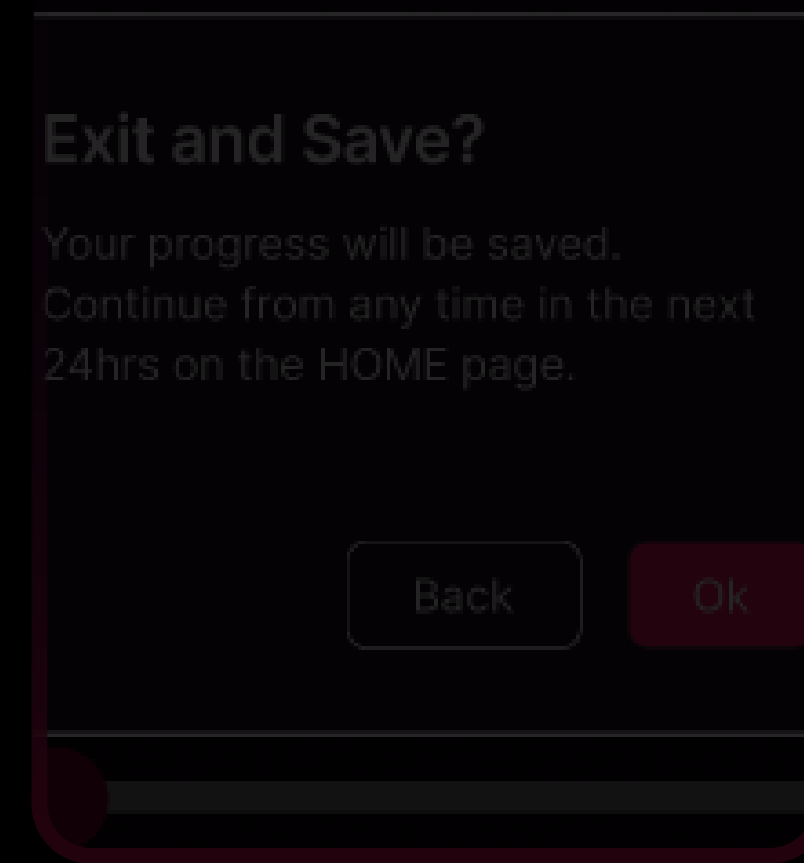
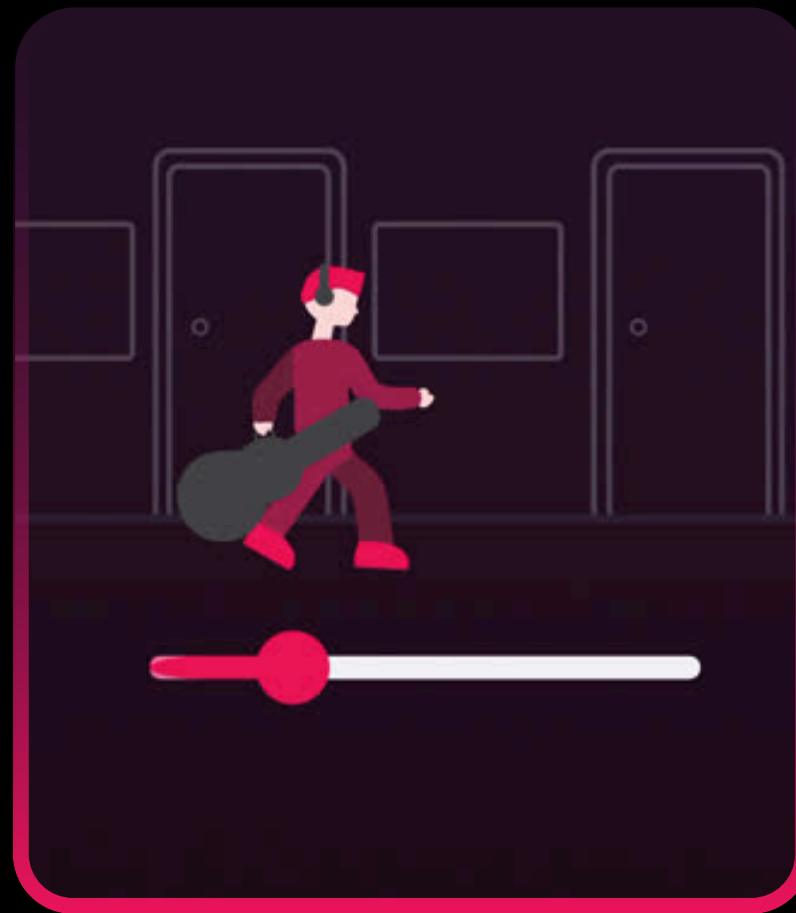
Offboarding personalization

Micro-interactions/ Pop-ups



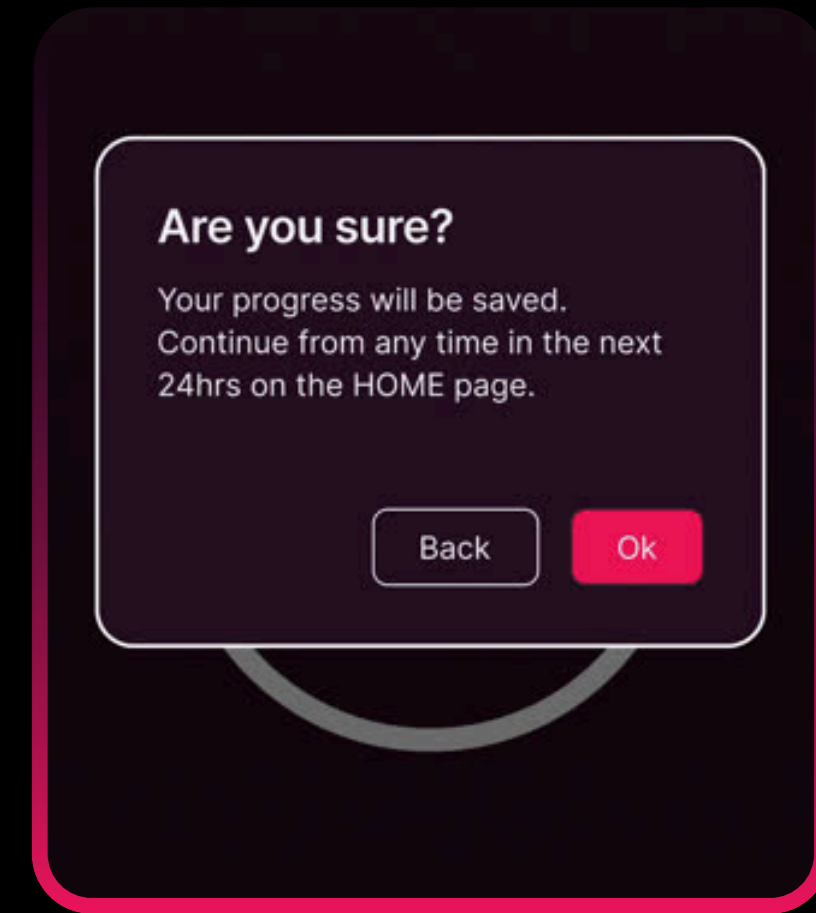
Wanted ways to add engagement to the test

Micro-interactions/ Pop-ups



Multiple visuals/interactions to prevent boredom

Micro-interactions/ Pop-ups



Popups to notify users of warnings

The Business Value

How does this fit into Dolby's Business Model?

The app **extends Dolby's core audio expertise into consumer-facing accessibility tech**, creating opportunities for freemium features, partnerships with device makers, and long-term user retention.



How would users heard about it?

Discovery would happen through **social media** (TikTok, Instagram), **accessibility and hearing-health communities, and app stores**. It can also be marketed through user group activities such as gaming and music channels.





Next Steps

CONDUCT A
FINAL USABILITY
TEST



COMPLETE
HI-FIDELITY
PROTOTYPES



DOCUMENTATION
AND DELIVERABLE
HANDOFF



Thank you!

Questions for us?