



HI-FI REPORT

CS 147 - Augmented Humans Studio - Assignment 8

VALUE PROPOSITION

We're your rock.

OUR TEAM

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PROBLEM AND SOLUTION OVERVIEW

Everyone's uncomfortable sometimes, but we want people to get comfortable with being uncomfortable. Whether it be meeting new people, public speaking, or finally getting the courage to talk to your crush, everyone needs a little push and guidance to navigate to lean into those experiences and grow in competence and confidence.

BOLDer gives people the structure to identify and practice social areas of growth. We provide encouragement and motivation to continue practicing even when it's easier not to. We provide formal training for resiliency in a setting that's safe. We're BOLDer: we're your rock.

TASKS AND FINAL INTERFACE SCENARIOS

Simple Task

Turn on the earpiece, record a conversation, and file the conversation.

This task is accomplished using only the BOLDer earpiece. The user presses and holds the touch sensor to power the earpiece on. There are then two avenues the user can go down. One option is to double tap and immediately begin recording. A second double tap will stop the recording, and the user is then prompted by the earpiece to select a task (or create a new one) to file it under. The user scrolls through tasks using the earpiece and then taps to select one. The second option is to first scroll and select a task, and then double tap to start/stop recording. In this scenario the audio is automatically saved to the selected task.

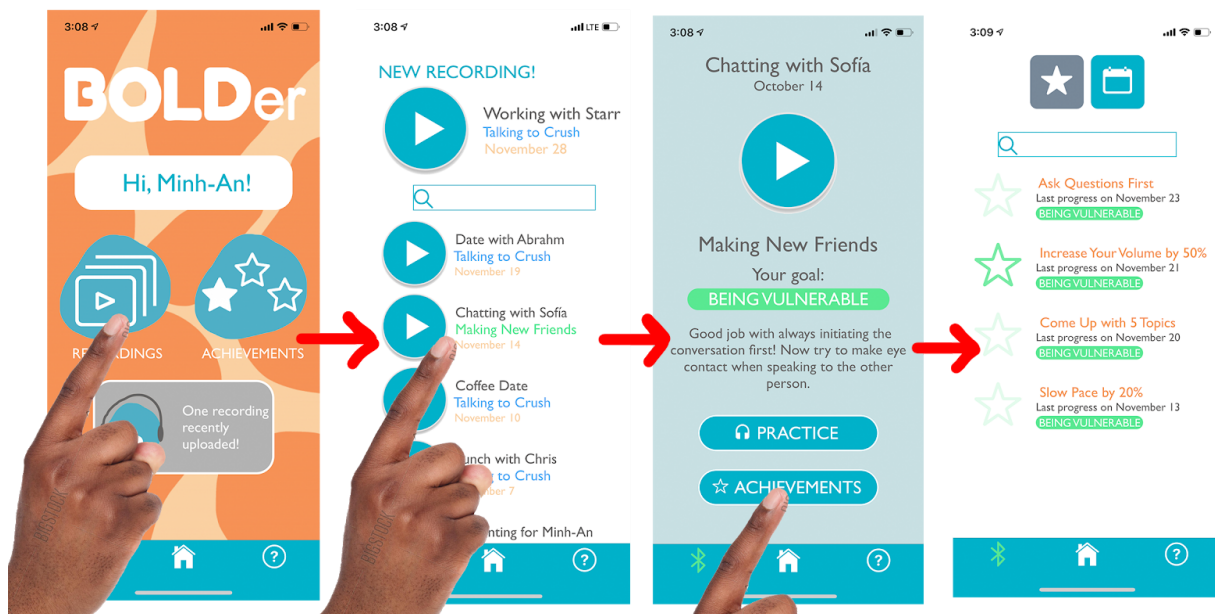
(Walk-through of simple task / earpiece recorded [HERE](#))

We chose this task because it is the most fundamental to BOLDer's purpose. It's essential that users understand how to operate the earpiece and the basic functionality of recording awkward snapshots of their lives, as we believe that re-living and listening to yourself is a great way to learn and reflect on how to improve.

Medium Task

Find an past recording and view achievements related to that recording's goal.

The user starts on the homescreen and navigates to 'Recordings' via one of the large center buttons. The user scrolls through their recordings, listed in chronological order, with the associated color-coded skills listed below each recording. The user selects one of the recordings which brings up a screen with more detailed information about that recording and an option to practice. The user then selects the "Achievements" button, which brings the user to a view of all of their achievements related to that goal, namely which is a small subset of specific goals related to the skill. The achievements are represented as star icons, with opacity indicating the progress. The darker shade of the color, the more progress made!



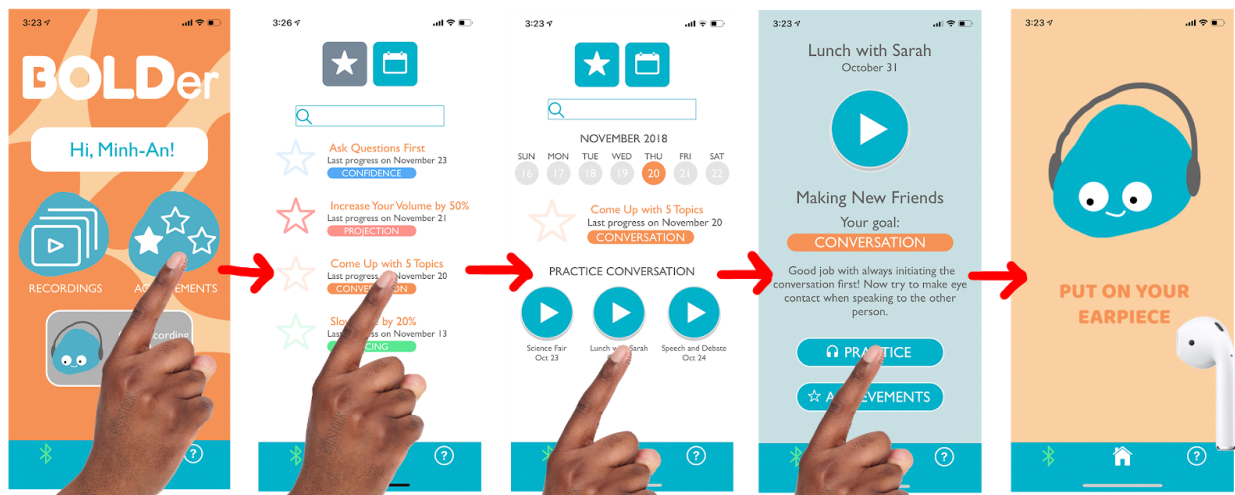
We chose this task because this is the central purpose of the app. We envisioned the purpose of the app as being a visual representation of all recordings, and visual metrics of progress to motivate the user to get back on their earpiece. By navigating the app to find the achievements related to that recording's goal, the user is able to get motivated to put themselves in similar situations and practice

that goal to improve their progress on their achievements, getting back on their earpiece and building resilience in this way.

Complex Task

Find an achievement with partial progress done related to a specific goal, and practice on similar recordings to get practice!

The user starts on the homescreen and navigates to ‘Achievements’ via one of the large center buttons. The user then selects any star that is not completely shaded in, indicating only partial progress. The user is brought to a screen detailing the date progress was last made for that achievement, as well as suggested recordings to practice the goal related to the achievement to make progress. The user can select any of these recordings, and then select the “Practice Button” once on the details page for that recording. The user is then prompted to put on their earpiece, where they are able to practice the recording.



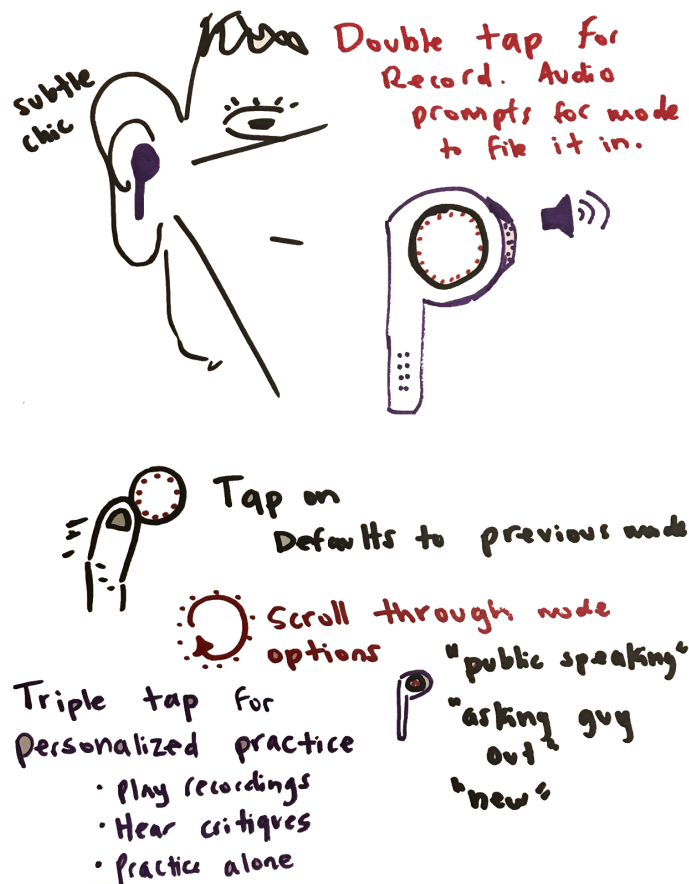
We chose this task because we believed it demonstrated best how the app and the earpiece connect. The earpiece was designed to be able to stand alone, without the app, as one of our goals was limiting the time the user would spend on their screen with the app. However, the purpose of the app was to motivate the user visually to practice more with their earpiece. The task of finding an achievement and going on to practice on similar recordings with the earpiece to

make progress on that achievement is at the cruz of how the app and the earpiece should work together.

DESIGN EVOLUTION

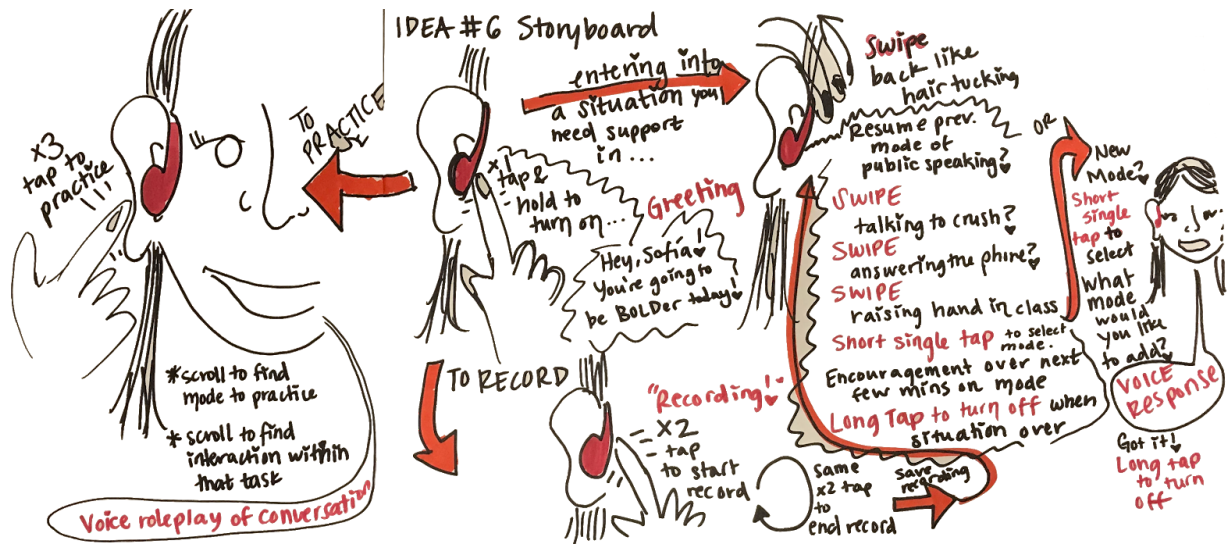
Initial sketches

Our design process began with designing an earpiece because we felt it was really important to get users off their phones and screens, as many of the stresses young people faced were due to pressures of social media and phone notifications.

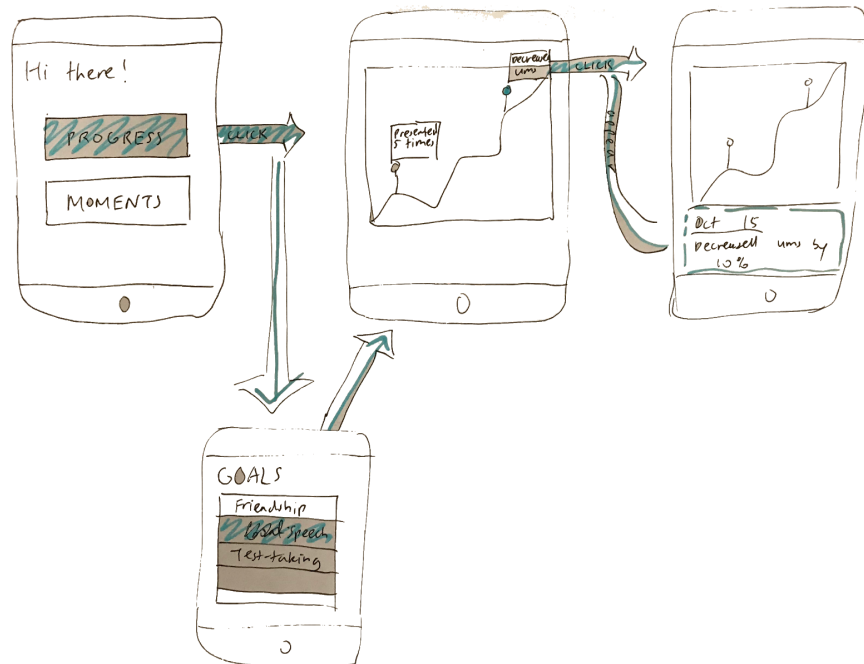


We then identified two main features the earpiece could accomplish: provide support in awkward interactions, as well as having a “practice” feature where users could practice reliving hard situations in a safe place, to build resilience in a controlled way. We storyboarded how the earpiece could do both these things as a stand-alone earpiece, again trying to get users away from their screens. Much of the design of the earpiece had to do with trying to find canonical

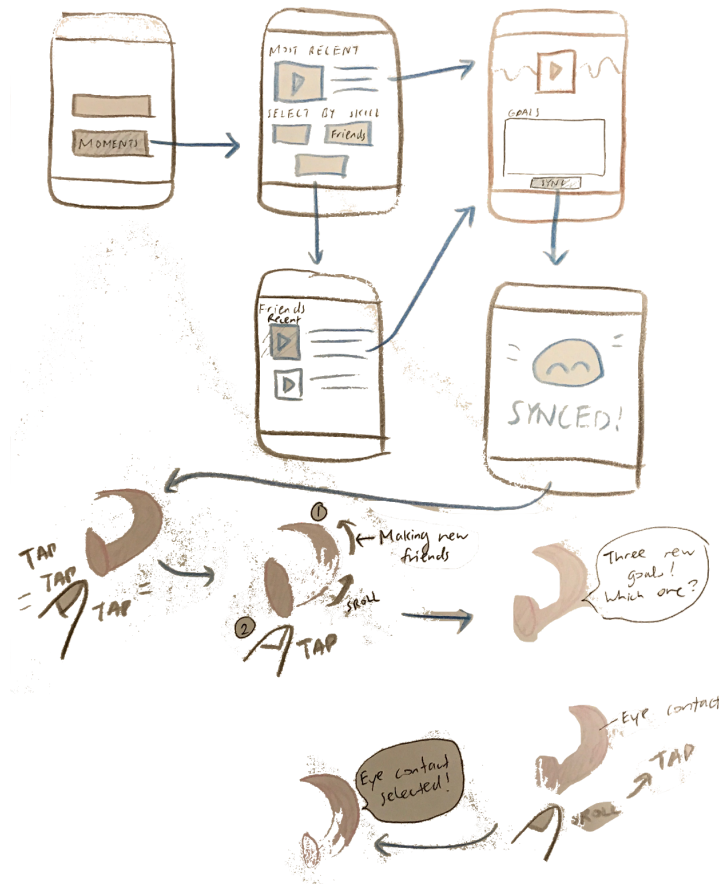
physical gestures for turning on a device, scrolling through a file system, and selecting certain options.



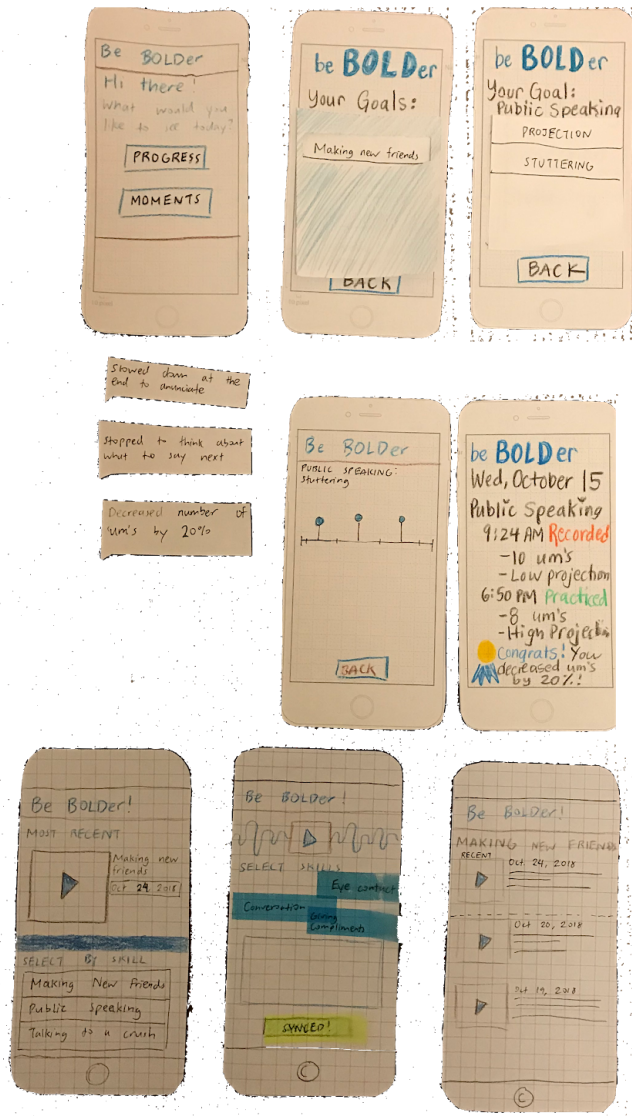
From here, we decided that we liked the idea of a stand-alone earpiece, but also thought it was hard for users to keep track of a filesystem through just audio prompts without any visual representation. Additionally, we wanted to add in an element of incentivization for users to continue practicing and building resilience. From here, we decided to add in an app that could display achievements to incentivize the user:



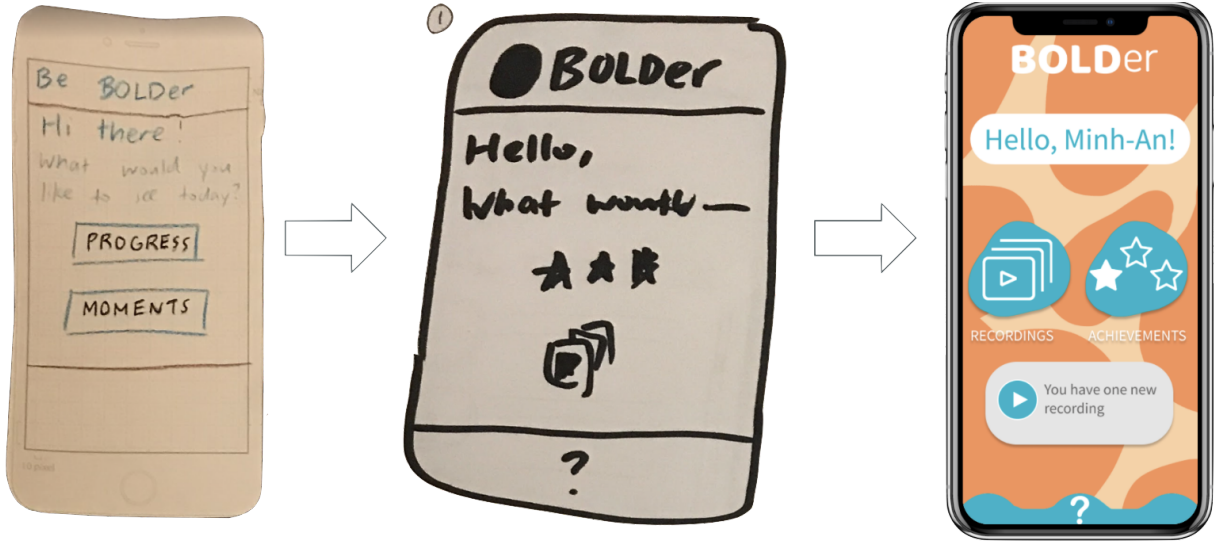
We also wanted the earpiece to display the filesystem of recordings, and past recordings, in some way visually so users didn't have to keep track of all this in their heads and through auditory prompts by the earpiece. This prompted us to design a way for users to view recordings and goals and sync with their earpiece.



We named these two features of the app “Moments,” where the user had access to the file system of past recordings and their goals, and “Progress” for a visual representation of use of the BOLDER software over time and user achievements and progress. From here, we tested our app and earpiece design in a low-fi usability test:



From our user testing, we found several needs not addressed. Firstly, we found that the boxy layout of our low-fi prototype app sketches were ineffective. For the boxy icons representing recordings, users were confused that these were audio recordings and not videos. Thus, we changed these icons to circular/rounded objects with the play button, which we felt better represented audio files, as it is more similar to current playlist/audio clip file icon representation. This also prompted more consistent choices throughout the app to go with more rounded, friendly, and playful shapes and imagery.



This also prompted more consistent choices throughout the app to go with more rounded, friendly, and playful shapes and imagery.

growth



Light hearted

rounded



encouraging

friendly



bold

cute



Logo: Baloo, 72 pt, **bolded**
first four chars

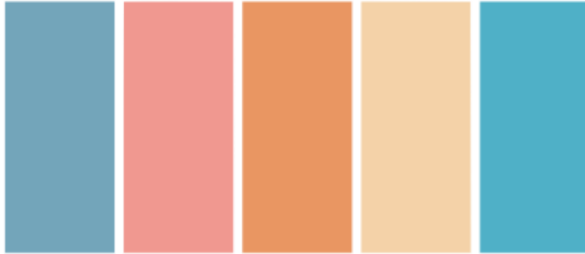
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24 pt for subtitles
18 pt for body text

Text Color:
#646363



Light Gray: #E5E5E5

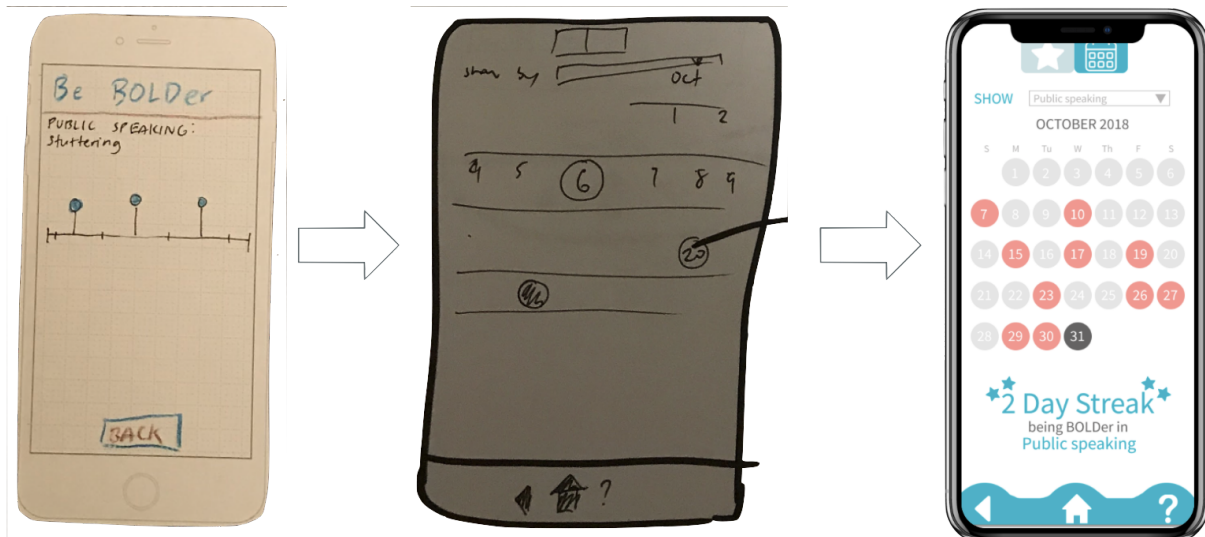
Rounded, friendly shapes



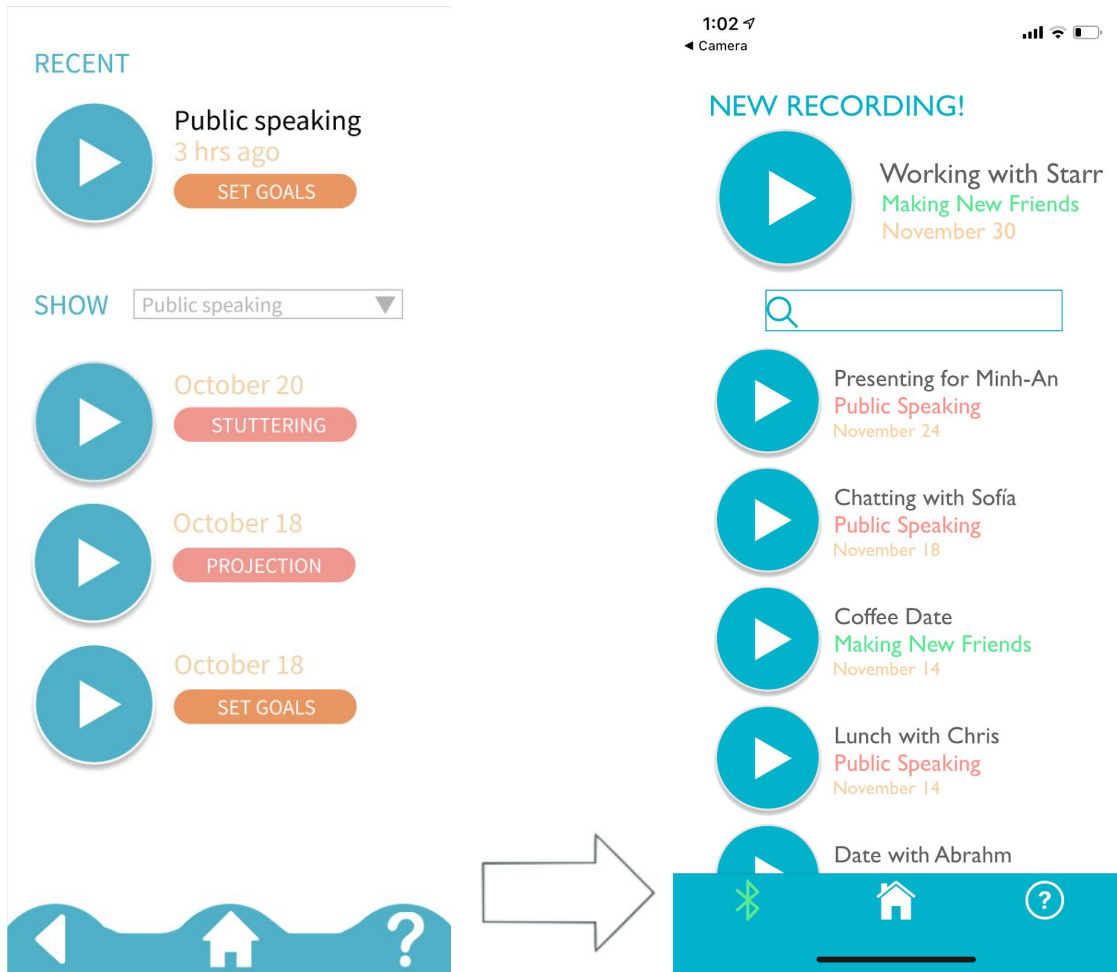
HEX	#646363	HEX	#E5E5E5	HEX	#F79256	HEX	#F4A2	HEX	#00B239
RGB	100 96 99	RGB	254 254 254	RGB	247 146 84	RGB	251 209 162	RGB	0 178 202
HSV	196 47 74	HSV	4 45 100	HSV	22 65 97	HSV	52 29 98	HSV	187 100 79
CMYK	47 12 0 26	CMYK	0 42 45 0	CMYK	0 41 63 3	CMYK	0 17 35 2	CMYK	100 12 0 21



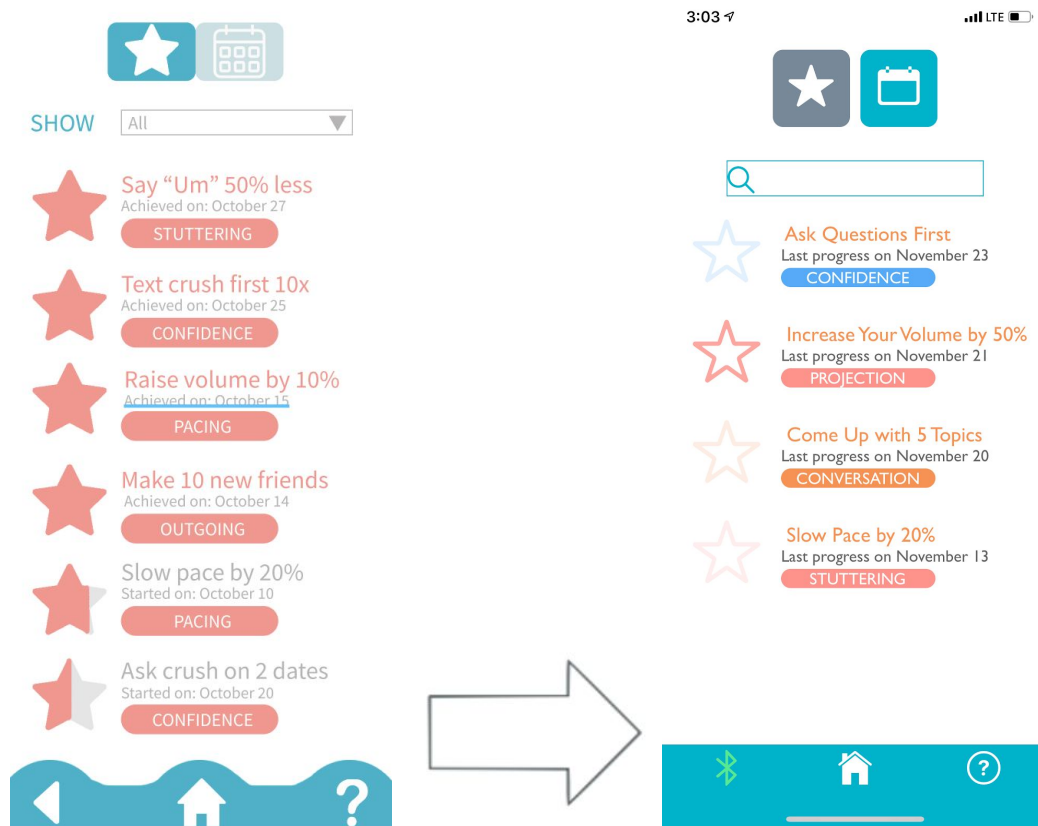
the need for a different display of achievements and progress that were not linear pinpoints in a timeline without any description. This led us to a calendar view of hotspots in our Medium-Fi prototype to better communicate activity over time:



From our medium-fi design to our hi-fi design, we worked on greater consistency in our color choices and use of color to make choices more visible and important information pop out, such as on our recordings screen:



We also focused on our minimalist design, and aiming to declutter the appearance of screens that were displaying long lists of lots of information:

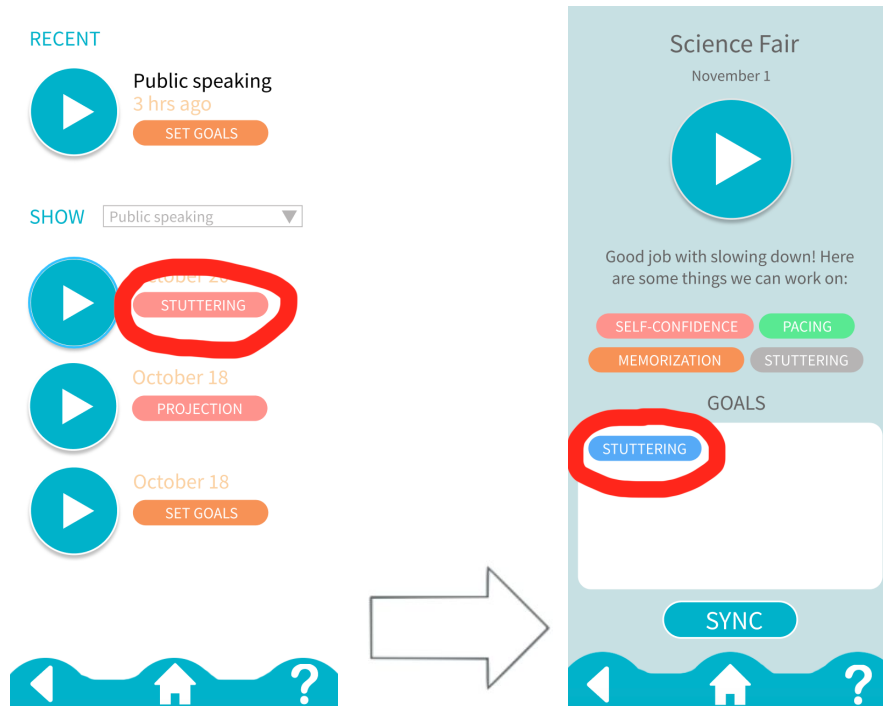


MAJOR USABILITY PROBLEMS ADDRESSED

Level 3 & 4 Violations

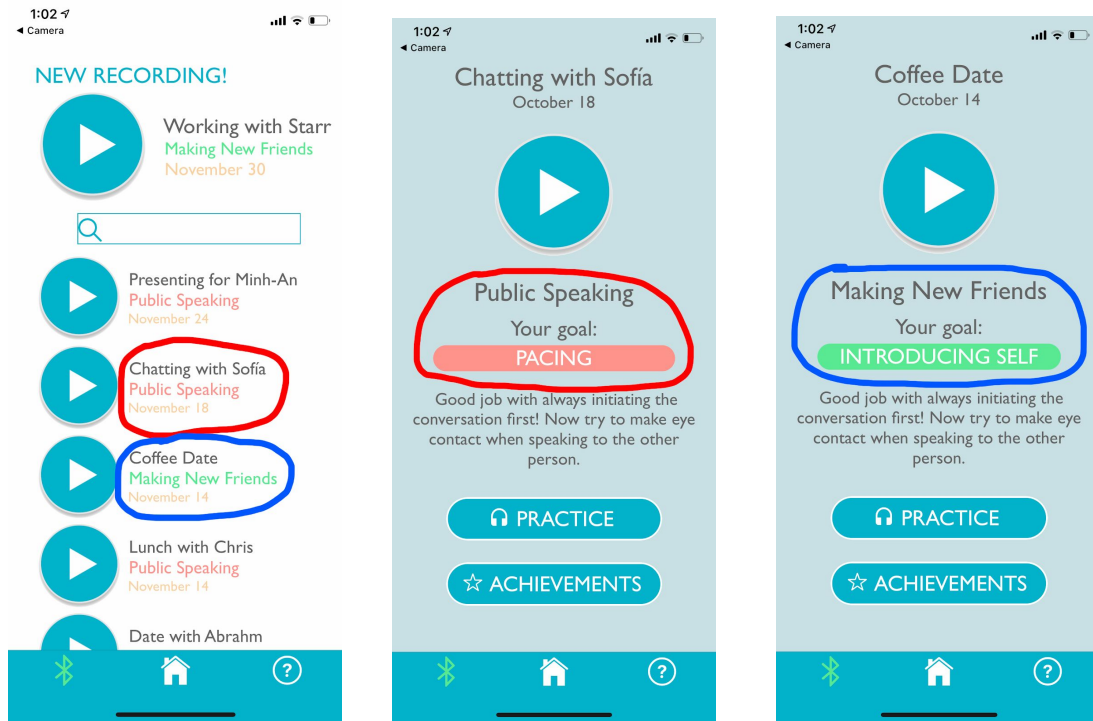
Consistent colors for goals:

In BOLDer, users can set goals they want to work on with their recordings, which are annotated with a small colored pill button in the BOLDer color scheme. In our Medium-Fi prototype, we arbitrarily colored the pill buttons to colors in our color scheme. The colors we used to represent the goals in were not consistent page-to-page, which the heuristic evaluators found confusing for quickly identifying goals.



As you can see, in the snapshots depicted above, stuttering is depicted as a pink button (circled) on the list of recordings screen, but listed as a blue button (circled) on a recording details screen.

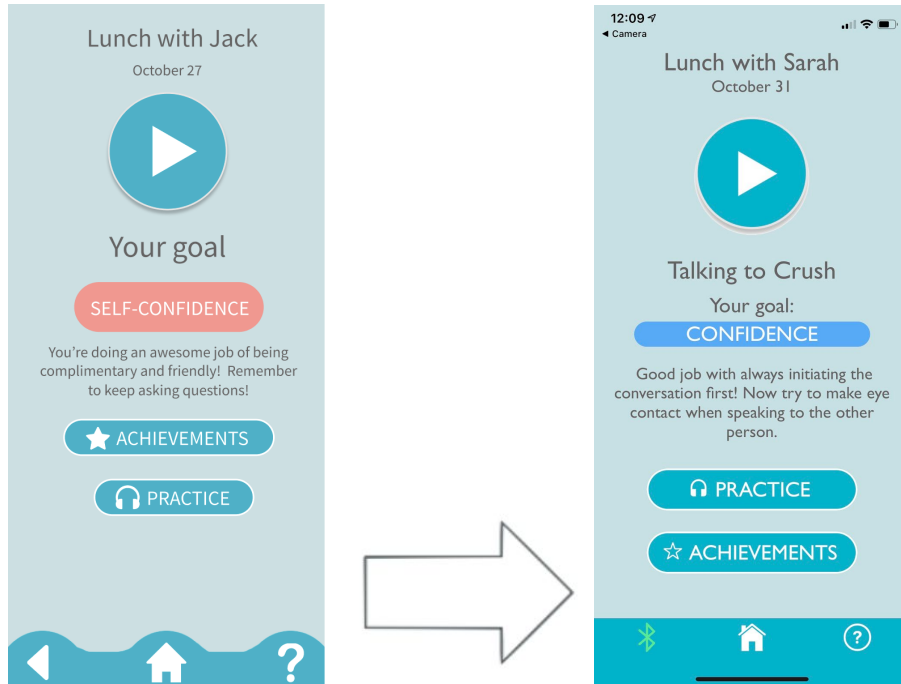
In our hi-fi prototype, we remedied this issue by keeping a map of all skills on the app to corresponding colors in the BOLDer color scheme. Every time a particular goal related to a certain skill was listed, it would be represented in its corresponding skill color.



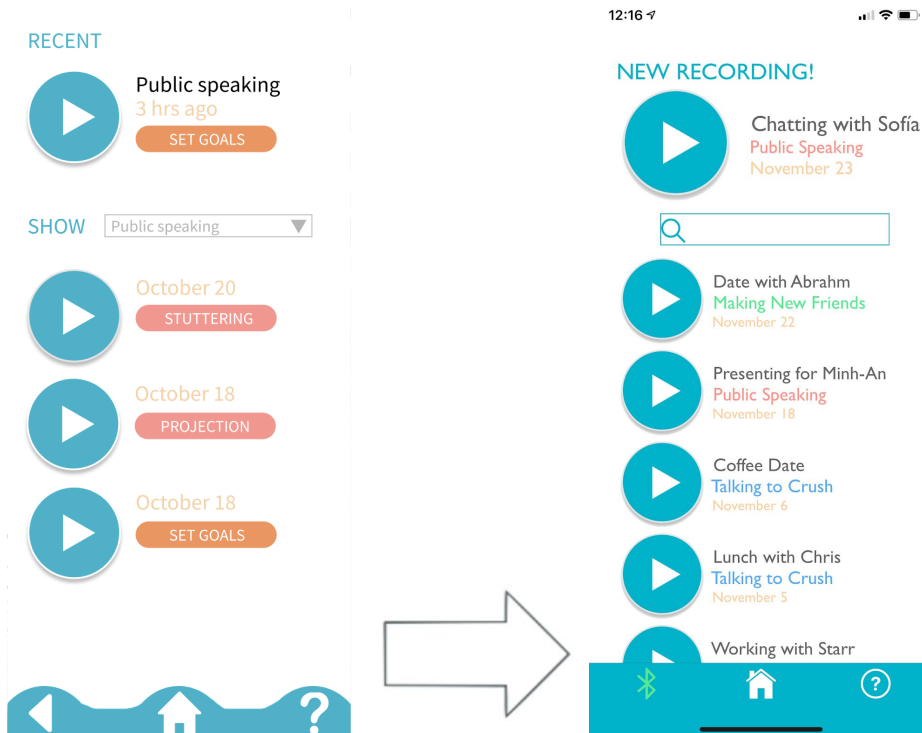
As you can see above, the “public speaking” recordings, goals, and information all have pink color accents, whereas the “making new friends” recordings, goals, and information all have green color accents. This color consistency will enable users to more quickly identify recordings with similar goals, and thus more quickly navigate through the app.

Less space for recording icon, more space for details:

In our medium-fi prototype, our screen displaying recording details had really small text and over-emphasized the recording icon. We shrunk this icon slightly, and instead made the focus of the screen the text and information about the recording. We believe that now, space is more appropriately allocated to objects based on their importance.



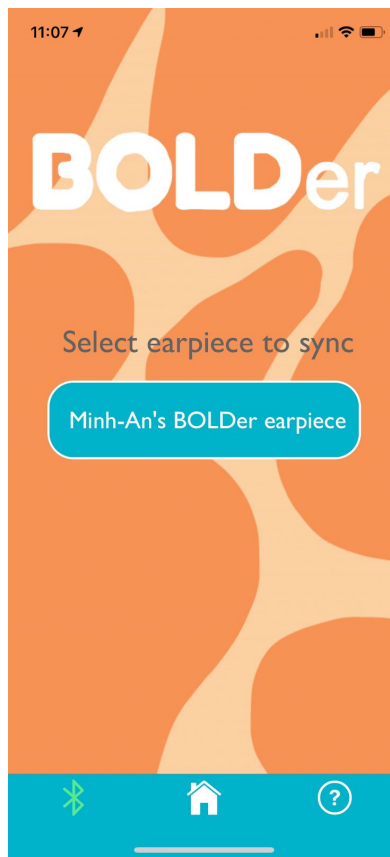
Additionally, on our list of all recordings screen, we similarly shrunk the recordings icon slightly and emphasized the text and communicating more textual information on the screen.



App paired indicator & “Remember this Phone” Feature:

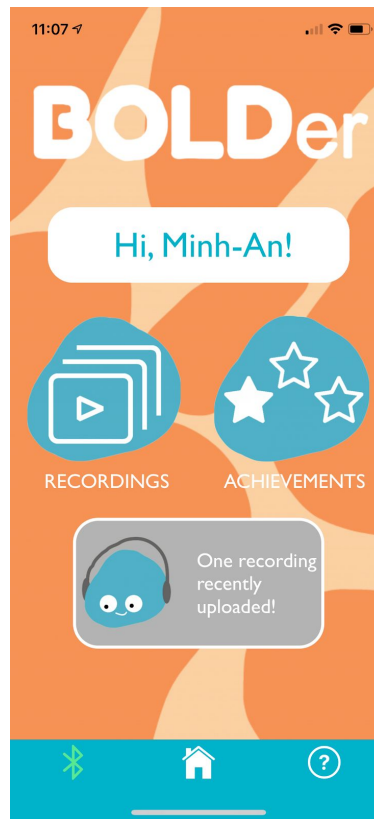
We previously had no information about the connected BOLDer earpiece available on the application. Users could elect to “Sync” with an earpiece, but there was no indication of what earpiece the app was connected to.

We added an initial screen when opening the app to select the BOLDer earpiece to connect.



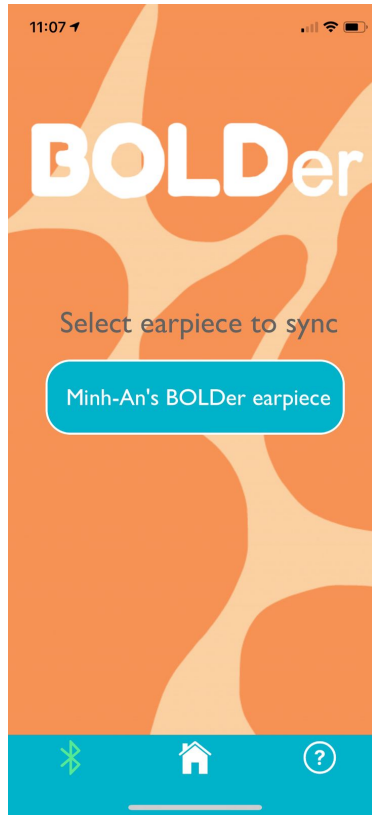
Listed on this screen are previously synced and remembered BOLDer earpieces. We envision the earpieces connecting via Bluetooth, although this is currently a Wizard of Oz feature. A Bluetooth device must be selected in order to continue on with the app, as the intention is for the app to purely supplement the earpiece by encouraging the user to continue on practicing with the earpiece. The app is not meant to stand alone without an earpiece.

Once a earpiece is connected, the bluetooth icon at the bottom bar glows in green, signaling that an earpiece is connected. This icon persists on all screens.



After the app is opened and a Bluetooth device is selected, the user is brought to the Homescreen, which shows a greeting depending on the user's name, taken from the Bluetooth device. The green Bluetooth icon glows in the bottom toolbar, confirming that a device is connected.

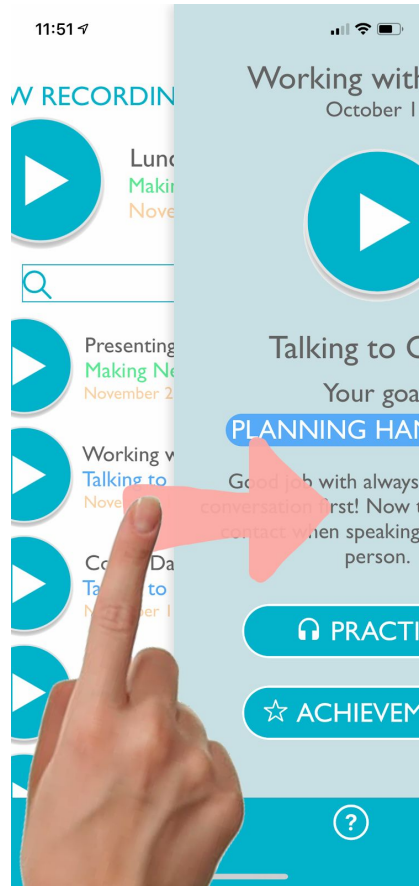
If the user continues navigating through the app and wants to check which earpiece is connected, they can click on the green Bluetooth bottom icon at any point, which brings them back to the Bluetooth selection screen, displaying which device is already connected.



We hope that this provides users with a feeling of security that their recordings are being sent to the appropriate device, and feel kept in the loop at all points of who could have access to their most private conversations.

Consistent back button and option:

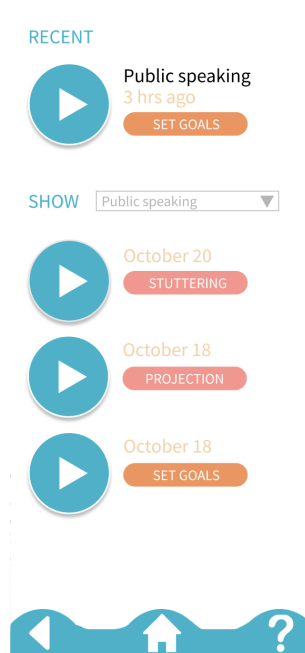
In response to feedback that a back button to the previous screen or state was not always available, we implemented a “back” feature that works on every screen. The user is able to swipe from the left side of the screen to the right to swipe back one step, a very canonical gesture to move back.



Previously, on our Medium-Fi prototype, we had a back button in the toolbar that directed the user to the page we assumed they accessed the current screen from. With our new back-swipe implementation, the user is brought back to whatever screen they previously came from with a simple, intuitive gesture.

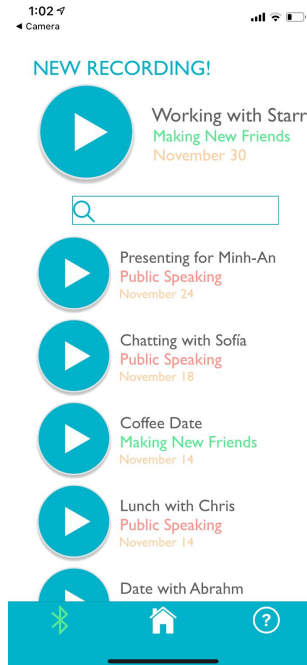
More details about the recording than just the date:

In our Medium-Fi prototype, on our main list of recordings screen, we offered sparing information about the recording. We only listed the date and the goal.



Our heuristic evaluators pointed out that this made it difficult to identify recordings from this screen, and that we should provide more information on this screen so that users can more quickly find a specific recording, especially if they forget the date.

Thus, we added information about the title of the recording, the skill the person was working on, as well as the date. We believe that users can now find their recordings with greater ease.



Get rid of the things the earpiece cannot do:

In our medium-fi explanation of the earpiece prototype, it was not clear what sorts of data the earpiece was able to monitor on your recordings. Our heuristic evaluators were unclear whether the earpiece was able to take in visual information and track things such as eye contact, or whether it was just audio. We decided to keep the earpiece to just taking in audio information, and kept all of the discussion on the earpiece to things that the earpiece could have feasibly understood from just audio data.

VIOLATIONS WE DID NOT ADDRESS

Add a goals page:

Our Heuristic evaluators requested that we add a 'goals page' where users could visually see and track their progress on particular 'goals,' opposed to having to only see goals through their specific recordings and only track progress of achievements. We ultimately opted not to include a goals page in this way, because it wasn't in line with the function of goals that we envisioned. We envisioned users recording interactions that fell under certain concrete skills, such as "Public Speaking," or "Making New Friends." Within these various skills,

we had high level focuses of work, that we denoted as goals, such as “Projection” or “Confidence.” We didn’t view users as being able to make concrete progress on these broad goals, because that doesn’t mirror the real world. Can anyone ever say that they have actually achieved 100% confidence? That seems a bit contrived.

Instead, we envisioned users being able to actually track progress on their goals through something called “Achievements.” Achievements were “AI-generated” concrete benchmarks that could denote progress towards the goals. These were things such as “Increase your Volume by 50%,” or “Slow Pace by 20%,” as concrete measures of progress towards the goals “Projection” and “Stuttering,” respectively. In this way, we thought that our “Achievements” screen which tracked the progress of these measures served the purpose that the Heuristic Evaluators were envisioning for the requested “Goals page.”

PROTOTYPE IMPLEMENTATION

Tools we used:

We used a variety of tools to implement our Hi-Fi prototype. To create our background art and icons, we used Photoshop and exported the art and icons as pngs. We then used a free online tool called “imgbb” to host these pngs online so that they could be accessed through image source in our React Native Hi-fi app implementation. We found that accessing the images through their path in a folder was much slower and took a long time to load. For this reason, we hosted all of our images online through this free tool.

To create our iOS application, we used React Native with Expo. Expo was great in providing many ways to easily view live-time visual updates to the code through their App and QR code scanning. In addition to viewing the app on our phones, we also used the XCode Simulator to view the app on a virtual iphone screen. The documentation on React Native was quite helpful in creating this app, and we used many documentation tools such as Snack to view examples of code and how it looked visually, as well as a [Facebook’s documentation](#) of React

Native, which gave great walk-throughs of using various visual layouts. The pros of React Native were in the variety of available package installs that made lots of visual layouts easy to use, and the plethora of documentation about React Native and Expo. Limitations to this tool were that none of us really knew Javascript, had any experience with app development, or any familiarity with script languages in general. This made understanding a lot of the basics really difficult and frustrating to try to learn in the last few weeks of a class where app development had not been the focus thus far.

Additionally, we used Github to collaborate on the code together, which we linked to terminal, which made pushing, pulling, and merging very easy. Limitations of this tool were we had to push/pull really regularly to avoid merge conflicts.

In addition to our app hi-fi prototype, we also created a hi-fi prototype for the earpiece voice recognition software. To prototype the Boldie (personified BOLDer character who speaks to you on the earpiece) voice interaction, we used a combination of Google's text-to-speech API and the speech recognition module on PyPi. We first used the text-to-speech to craft a number of default phrases that Boldie could say, such as greetings, questions, prompts, and user options. Then, using the speech recognition module, we accepted the user's speech input, and through a long series of If/Then statements, Boldie would respond accordingly. This tool worked very well in producing life-like audio responses. The limitations of this tool were in that it wasn't very canonical for the python packages to hold states as objects and navigate the states depending on which response the tool got from the user. Instead, we had to use many if/then statements, which left something to be desired.

Wizard of Oz Techniques:

All of the interaction between the App and the earpiece software is a wizard of oz technique. There is no implemented communication between the two, and the alleged bluetooth connection to a BOLDer earpiece device is also a wizard of oz technique. Additionally, the prompt to select a recording and practice it on

the app, which directs you to your earpiece, does not actually sync with an earpiece and prompt the earpiece to go into practice mode for that interaction. All of this is a wizard of oz technique.

Additionally, our prototype of a BOLDer earpiece is an apple airpod, which is non-functional as an actual earpiece. Although the audio can play through the airpod and the airpod microphone can be used with our voice interaction software, none of the swipes and taps register on the earpiece.

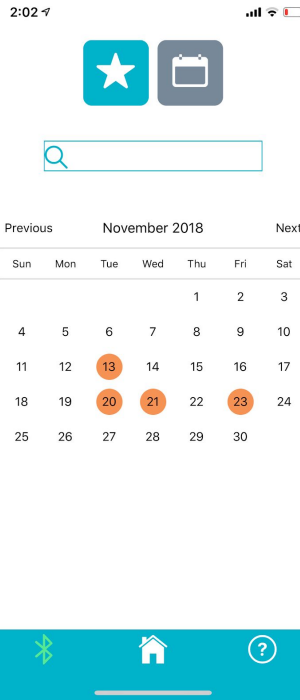
Another wizard of oz technique is the AI-generated goals and achievements. These are all hard-coded and selected based upon hard-coded arrays of options and maps between skills / goals / achievements, which are randomly selected within the map through a random number generator.

Finally, the recording functionality of the app is a wizard of oz technique. The earpiece and voice software does not currently record any interactions.

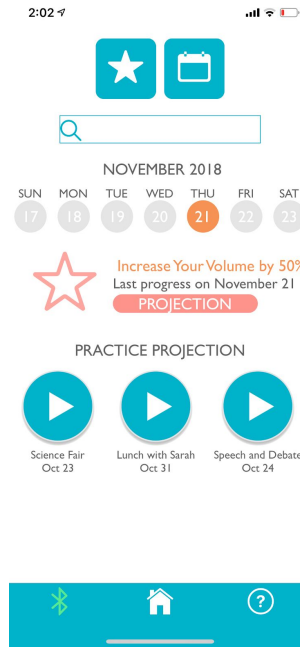
Hard-Coded Data:

As of now, Boldie can only handle certain inputs and cannot handle unfamiliar phrases. The practice sessions and recording mechanism are not fully implemented, as this would require more detailed natural language processing and artificial intelligence, what is outside the scope of this class and what we had time for.

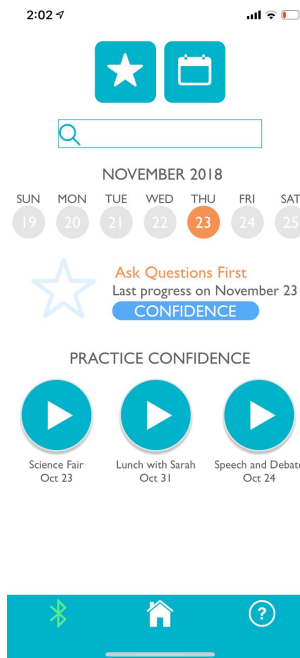
Additionally, within the app there are a hard-coded, randomly generated (process described above) set of recordings that fall under specific skills, goals, and achievements. This is all backed by a global data structure in the app that gets reset every time the app is opened. Additionally, many elements of the calendar view are hard-coded. For example, all of the hotspots in the month-calendar view that you can click on to see activity on that day are pre-set. On the image below, all of the dates with orange highlighting, indicating activity on that day, are pre-set:



After clicking one of the month hot-spots, you are brought to a screen with more specific details about the achievement progress that occurred on that day. There is a small snapshot of the week above it, and it is hard-coded that the selected day with activity always appears as a Thursday. For example, were a user to select to view the 21st of November on the month view, which occurs on a Wednesday, the details screen still shows it as a Thursday:



Similarly, if they were to select the 23rd on the month view which is a Friday, the details screen would still show it as a Thursday:



Finally, in the calendar view, the suggested recordings to practice that specific goal are hard-coded in their dates and titles (Science Fair, Lunch with Sarah, Speech and Debate), however appear to be practicing the intended goal when selected, which varies on which date and achievement was selected by the user.

What we would add with more time:

With more time, we would back the app with Redux to manage the memory and state of the screens better, so that information could persist on the screens even when closed. Additionally, this system would enable more dynamic memory and enable us to keep a database of sorts of the recordings in the app.

Additionally, we would add a more dynamic calendar view more time, featuring a horizontal scroll on the week details view.

It would also be interesting to add in actual audio information to the app, enabling it to play back “old recordings.” Currently, there is no audio information stored in the app.

Finally, we would add in more variants to the types of responses that Boldie could respond to, to be more flexible in its use.

SUMMARY

Modern technology can connect us to billions of people in an instant, but sometimes we forget about the few people right in front of us. Online interaction is important, but expressing an idea through text is fundamentally different than face to face interaction. In a world of increasingly ubiquitous technology, our team fears that these real-world skills are becoming a thing of the past. So how can we help people get back into the real world? In every teen’s pocket there is already a device that allows them to socialize with friends, play games, browse the internet and so much more with just the tapping of a few buttons. Perhaps the last thing anybody needs is another app to get lost among the clutter.

That’s where BOLDer comes in. Our wearable earpiece is tailored through real user’s needs to help steer people away from their distracting technology and back into the real world. By providing feedback on social interactions, real time

tips and tricks, and helping users track their progress, BOLDer is the tech that's augmenting our ability to relate to other humans in an authentic way.