

Super 8

Process Book

Prototyping for Electronics
Professor Park
Winter 2021

Overcoming
Nicotine
Reliance in
Young Adults

Gorby

Curb Your Cravings



The Problem

Smoking is the leading cause of preventable death in the world and with the sudden resurgence of smoking rates in younger generations, users need a personalized solution to combat their addiction.

The Solution

An app designed to facilitate smoking cessation through the use of the Gorb-E wearable. With its personalized design and ability to connect users throughout their individual journeys, users will feel more in control of their decision to quit.

Gorby

Executive Summary

Application

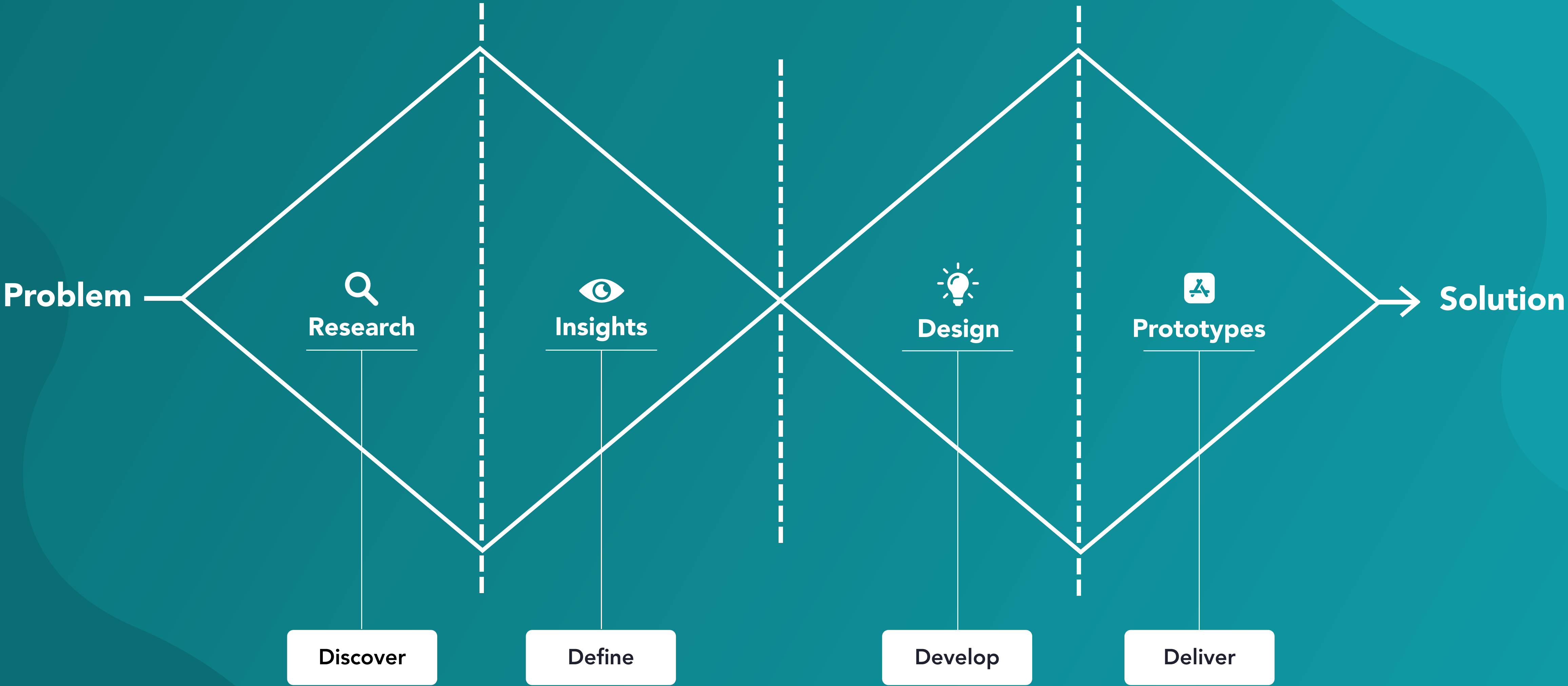
- Meet people in the forum to add to your gorby lobby
- Review your triggers, insights, and mood history
- Gain achievements to rank up your in app Gorby
- Receive advice during triggered events or heightened emotional states

Wearable

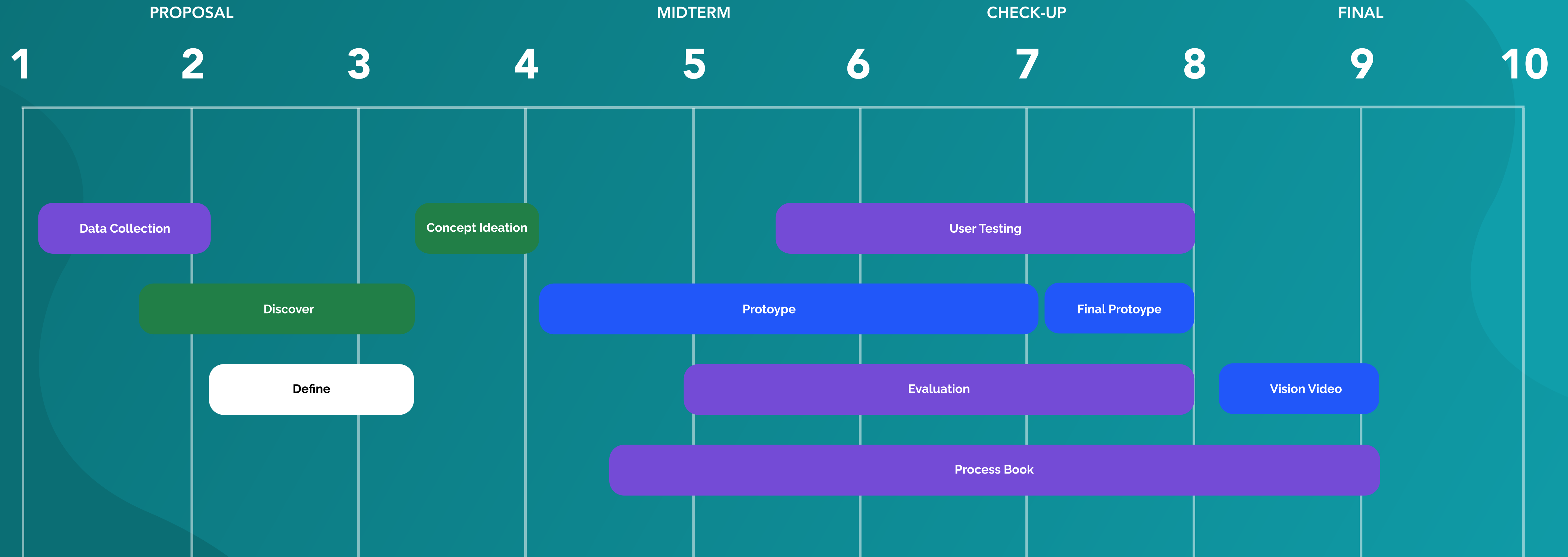
Direct connection to the application where you can review your insights.

Heart Rate sensor and GSR Sensor allows the application to identify heightened emotions.

Smoke sensor to identify when the user is around smoke.



Project Timeline





Sara Williams

Project Lead



Anh Tran

Co - Project Lead



Taylor Rosenfeld

Research Lead



Isabella Gonzalez

Graphics Lead



Jungmin Ahn

Interaction Lead



Satchel Hallmark

Product Lead



Sullivan Wilcox

Visual Lead



Colin Cheng

Branding Lead

chapter 1

Discover

Our topic of Interest.

Recovering from a vaping and smoking addiction.



Secondary Research





People with mental health problems may be more vulnerable to misleading messages about tobacco.



The more frequently a stimulus is presented, the faster habituation will occur.



Higher rates of smoking are found in those in institutions than those living at home.



Family and peer support provides the reinforcement necessary for the patient's success.



There were lower drinking consequences for those in Network Support, as alcohol is a common cause for relapse.



Activities are not as enjoyable or motivating to them in the absence of nicotine.



Smoking is the **leading cause of preventable death** in
the **world**.




11 million adults in the United States vape.



One in four US high school seniors vape.



Teens are **more susceptible to addiction** than adults because their **brains** are still developing.

A close-up, slightly blurred photograph of a person's hand holding a Juul e-cigarette. The person's face is partially visible in the background, looking towards the camera. The image has a teal overlay. The text is white and positioned on the left side of the image.

Although the aerosol in e-cigarettes is significantly less harmful than the 7,000 chemicals in a cigarette, it is important to note that the nicotine content of just **one Juul pod is equivalent to smoking an entire pack of cigarettes.**

Admin, and Admin -. "Teen Vaping: What You Need to Know." StrugglingTeens, 26 Oct. 2020. strugglingteens.com/parents/articles/teen-vaping-what-you-need-to-know/.



The Problem with Nicotine

Nicotine is a highly addictive substance, sometimes **compared to cocaine and heroin in its potency**, is the impetus to a smoking addiction.

"Why Is It so Hard to Quit Smoking?" Why Is It so Hard to Quit Smoking? | The Psychologist, thepsychologist.bps.org.uk/volume-26/edition-5/why-it-so-hard-quit-smoking.



Short Term Risks

Weight Loss

Nausea & Vomiting

Diarrhea

Breathing Difficulties



Long Term Risks

Disruption of Brain Development

Expanded Tobacco Use

Potential Drug Experimentation

Mood Disorders

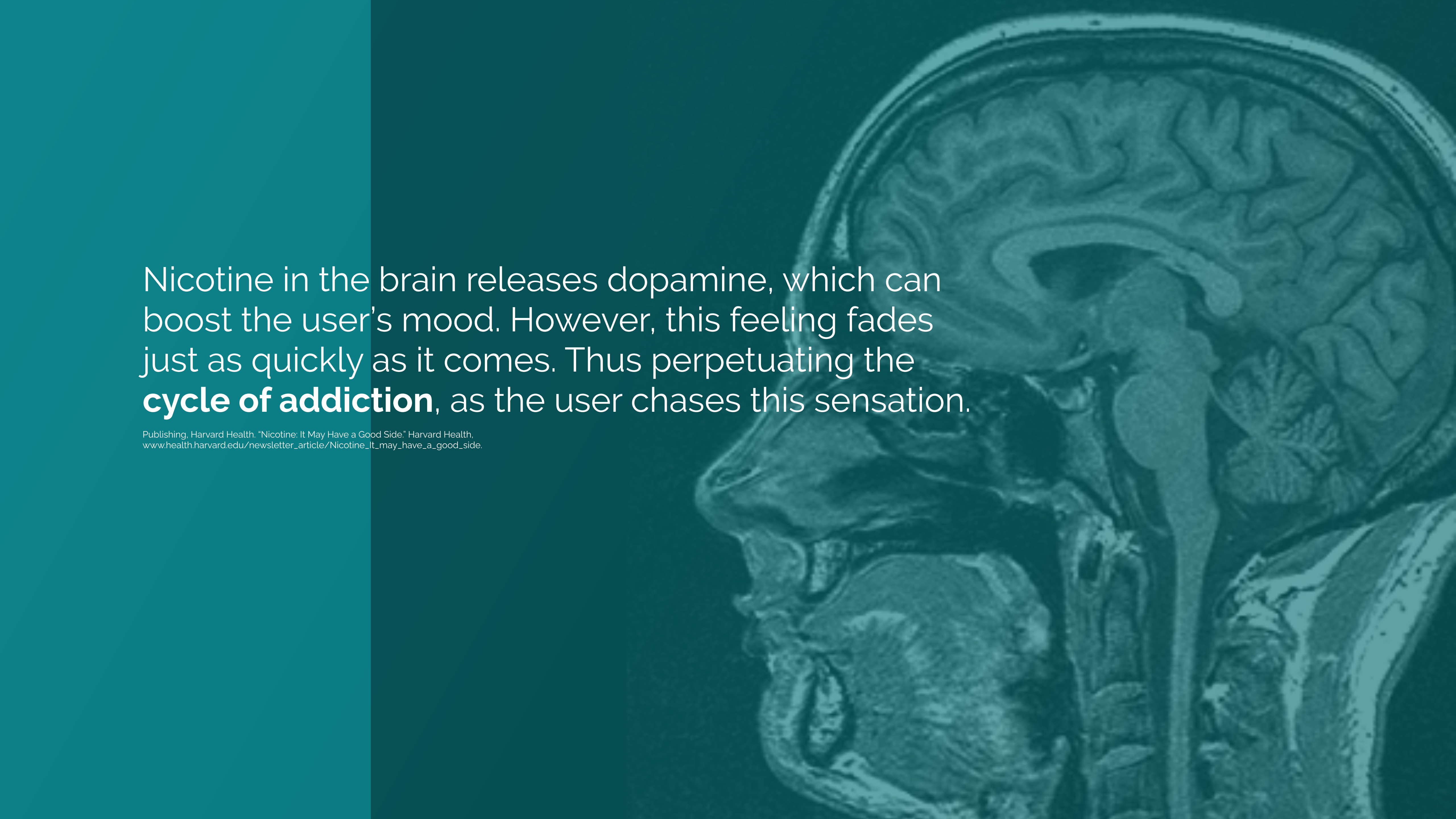
A hand holding a lit cigarette with smoke rising, and several discarded cigarettes lying on a wooden surface. The image is monochromatic with a teal/cyan tint.

There are more than **16 million Americans** living with a disease caused by smoking.

Florida Health. "How to Quit Smoking, Tobacco & More." Tobacco Free Florida, 2020.
tobaccofreeflorida.com/how-to-quit-tobacco/



**What does nicotine
do to the brain?**



Nicotine in the brain releases dopamine, which can boost the user's mood. However, this feeling fades just as quickly as it comes. Thus perpetuating the **cycle of addiction**, as the user chases this sensation.

Publishing, Harvard Health. "Nicotine: It May Have a Good Side." Harvard Health, www.health.harvard.edu/newsletter_article/Nicotine_It_may_have_a_good_side.



Nicotine & Mental Health

People living with **depression, anxiety or other mental health conditions are three times** as likely to smoke.

"Why Is It so Hard to Quit Smoking?" Why Is It so Hard to Quit Smoking? | The Psychologist.
thepsychologist.bps.org.uk/volume-26/edition-5/why-it-so-hard-quit-smoking.

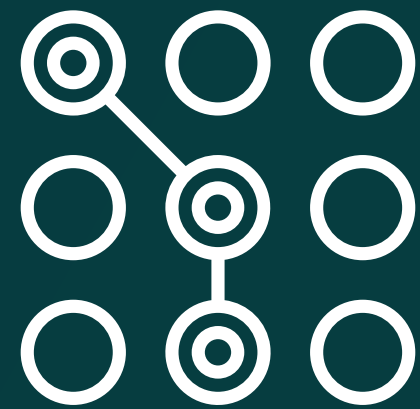
Just about nicotine consumption?

The more frequent the nicotine use, the higher the craving or desire for the dopamine release is.

The Four Types of Smoking Triggers



Emotional



Pattern



Social



Withdrawal

Overcoming and attacking triggers is a key part in recovery

Understanding your cravings and overcoming the triggers that cause them, is an essential step to beating addiction.

Opportunity Area

Avoiding the habituation and reliance of vaping & smoking in young adults, while keeping them motivated to recovery.

Problem Statement

Young people are at a higher risk of addiction to vaping & smoking (In US). Overcoming addiction is a difficult process that can **push people back into their old habits** if they **don't have a strong enough support system.**

Target Audience

Nicotine Addiction

18

Graduating high schoolers

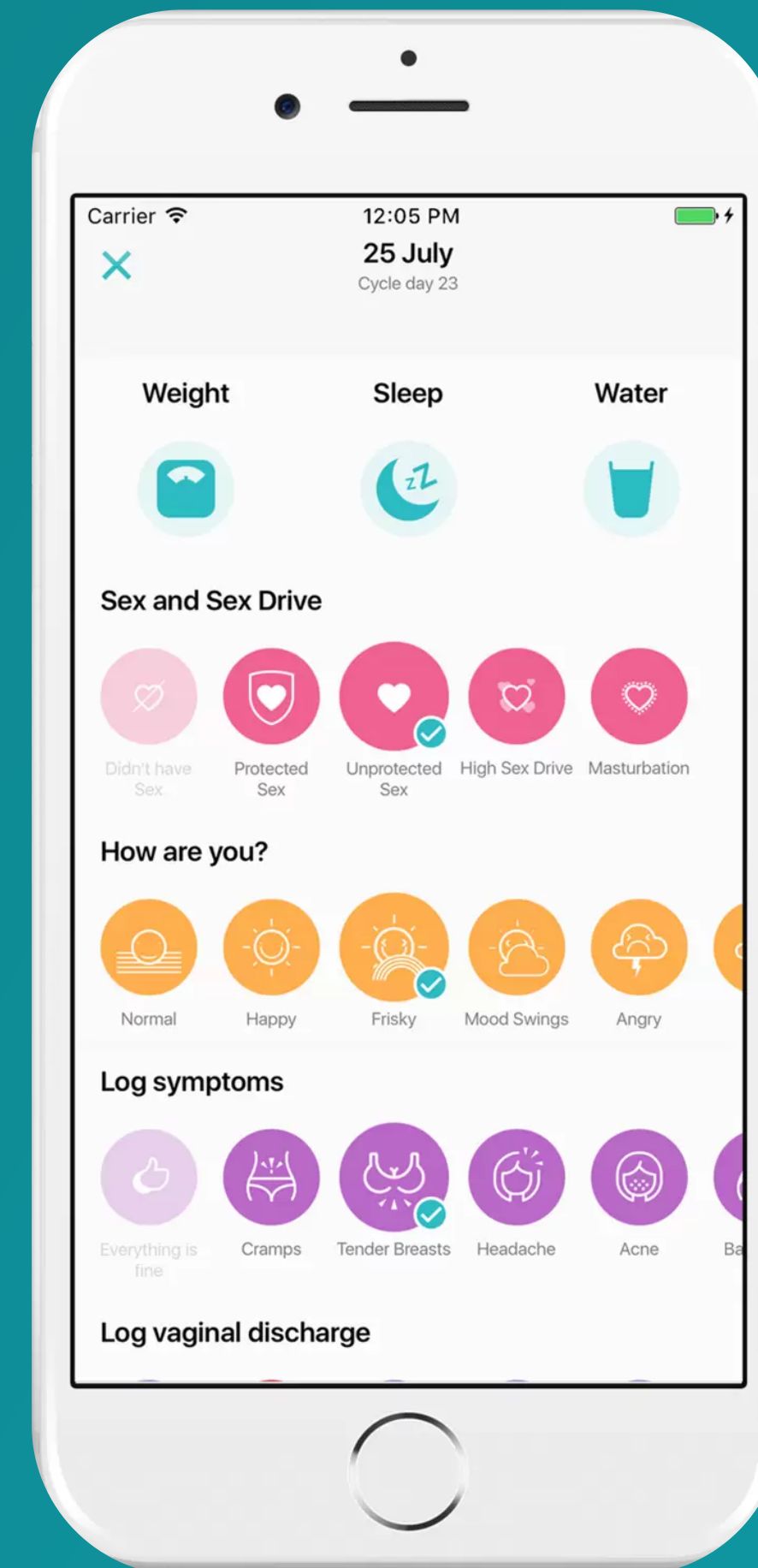
24

Young working adults

Competitive Analysis

Flo app

Flo App provides a community for users to ask and talk with strangers around the world. It identifies the patterns in user's experience and it monitors user's status and condition for giving them feedback to tackle the problem that they're facing.



Moodily

Moodily is an app tracking user's mood changes over time with a calendar-based user interface. It provides specific user experience data which will be submitting to the medical team afterward.



QuitNow!

QuitNow! aims to help users quit smoking just with their mobile phones. It suggests alternative activities to users to treat as a habit reversal and provides advice from professional organizations to users. To motivate users to keep active in the journey, the app has designed a series of games and challenges.



Primary Research



Primary Research

Survey:
51 Responses

User Interviews:
1st Round: 15
2nd Round: 6

51

Survey Responses

2

Interview Rounds

15

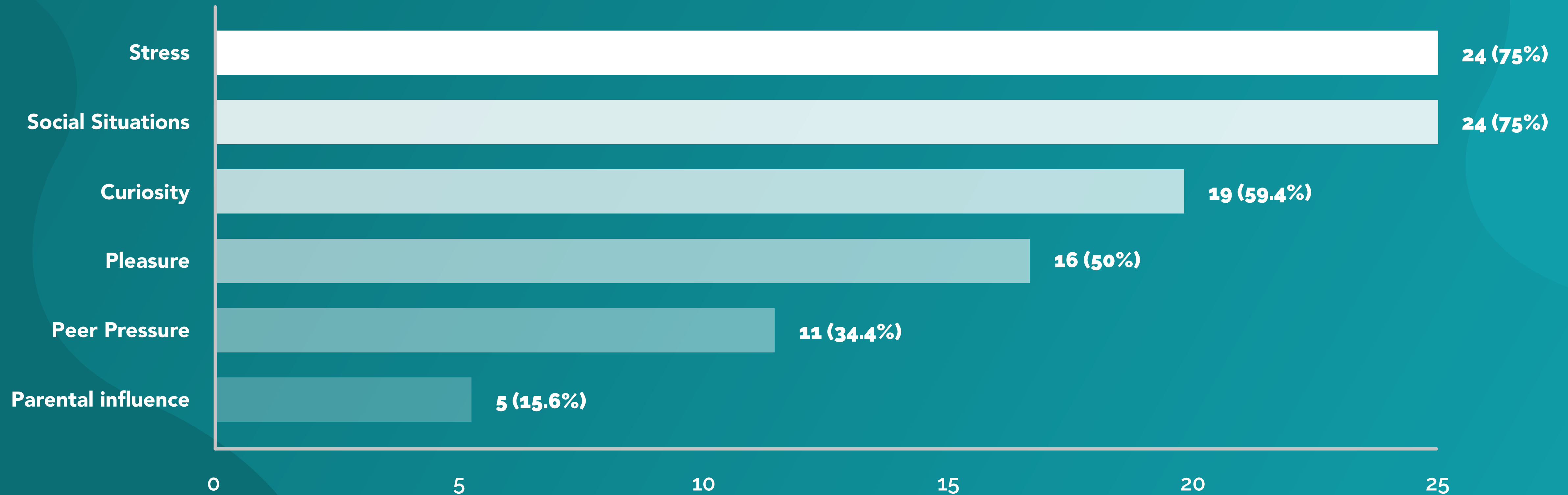
1st Round Interviews

6

2nd Round Interviews

Stress and social situations were the most common reasons users started smoking.

What made you start smoking? Check all that apply.

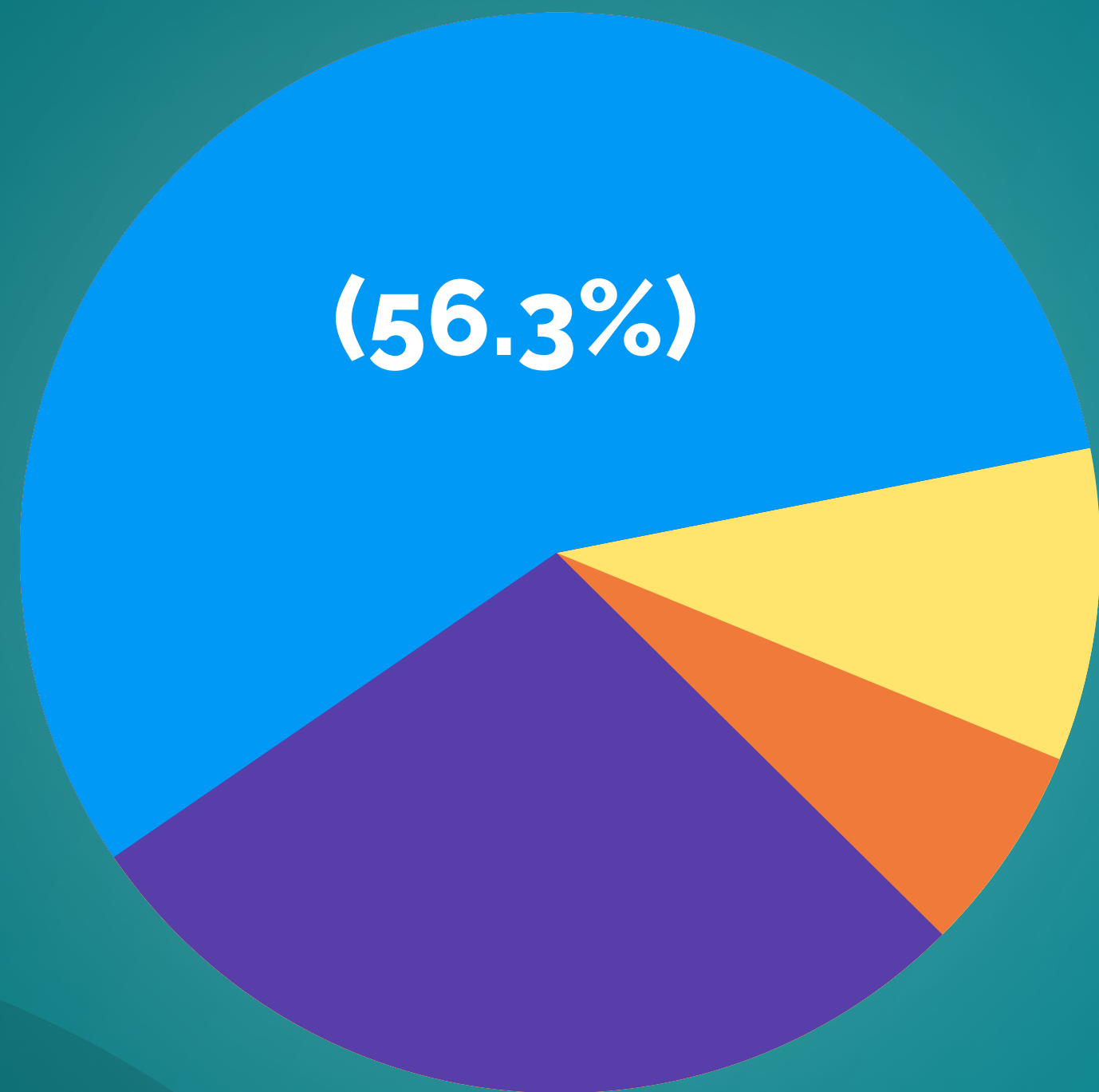


Majority of users have people in their social circle that smoke.

Do people in your family, social circle, or yours peers smoke? Check all that apply.



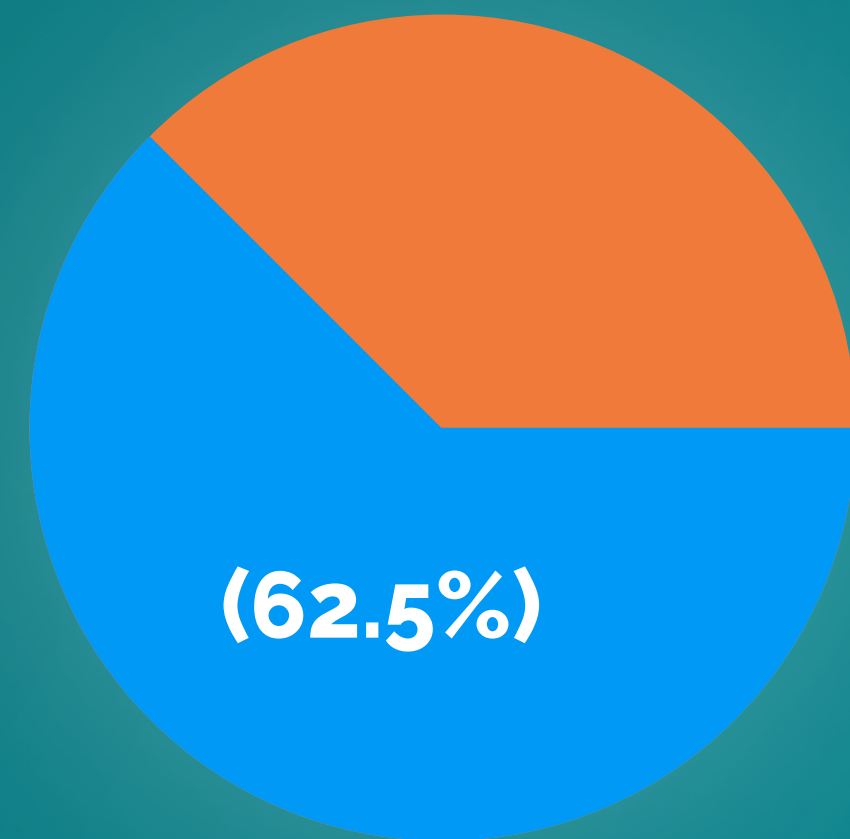
More than half of users use nicotine hourly (56.3%).



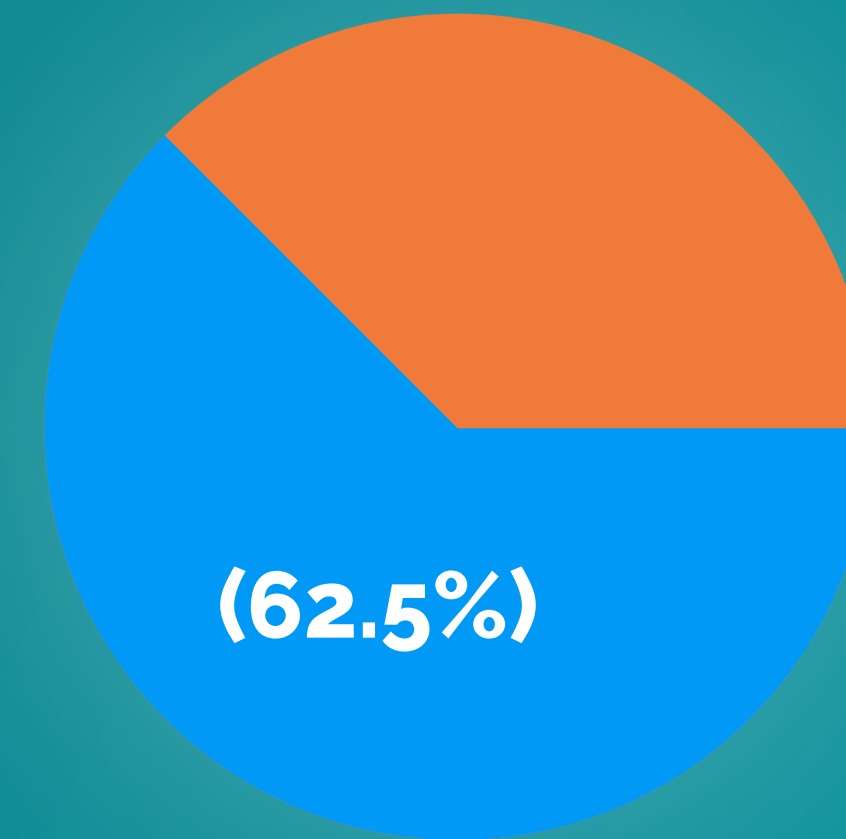
How often do you use nicotine?

- Monthly: 2
- Weekly: 2
- Daily: 9
- Hourly: 18

More than half of user have tried and want to quit nicotine (62.5%).

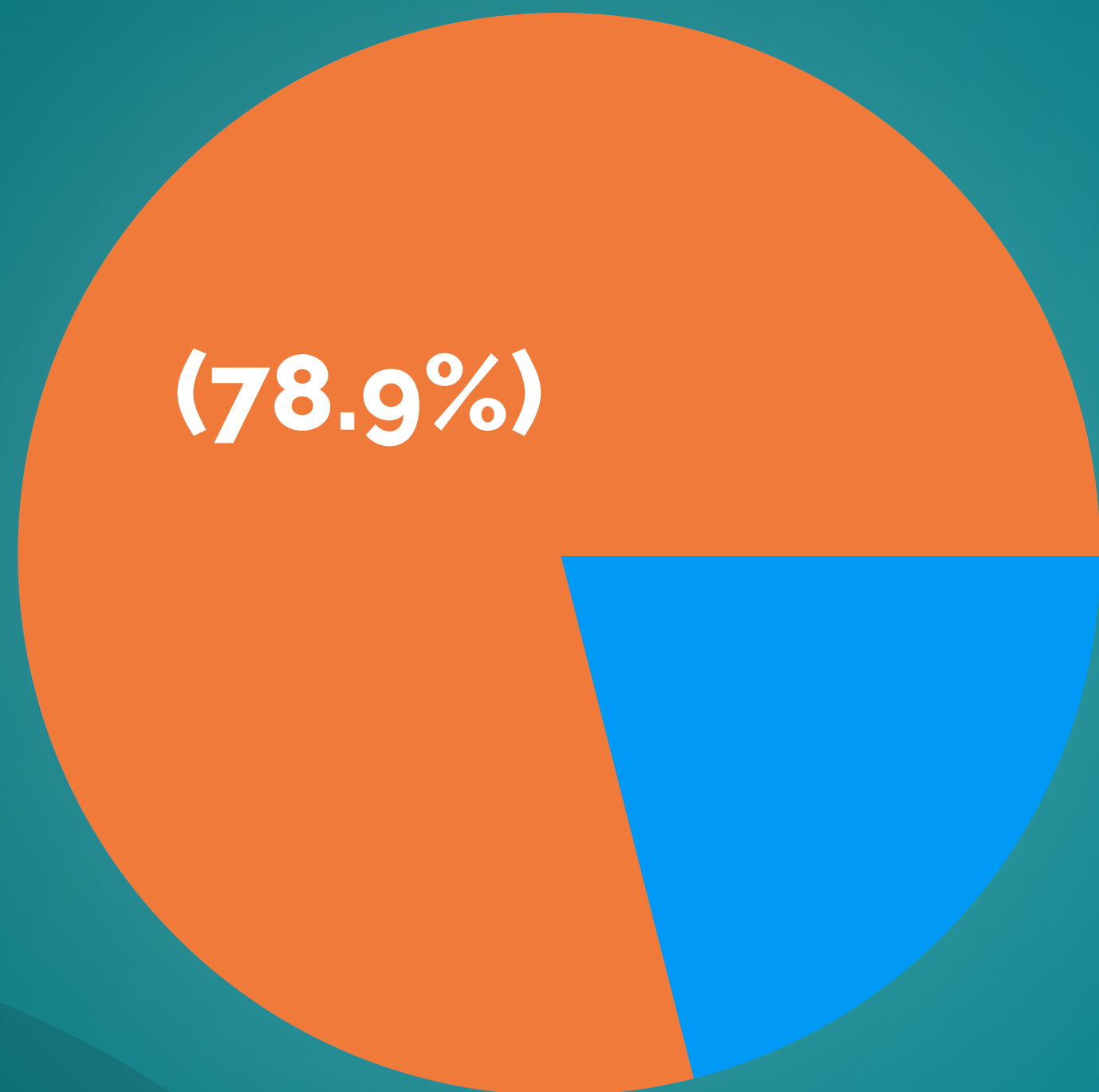


● Yes: 20 ● No: 12



● Yes: 20 ● No: 12

78.9% of users took on the journey of quitting nicotine by themselves.



Did you have the help of family, friends, or peers during your journey?

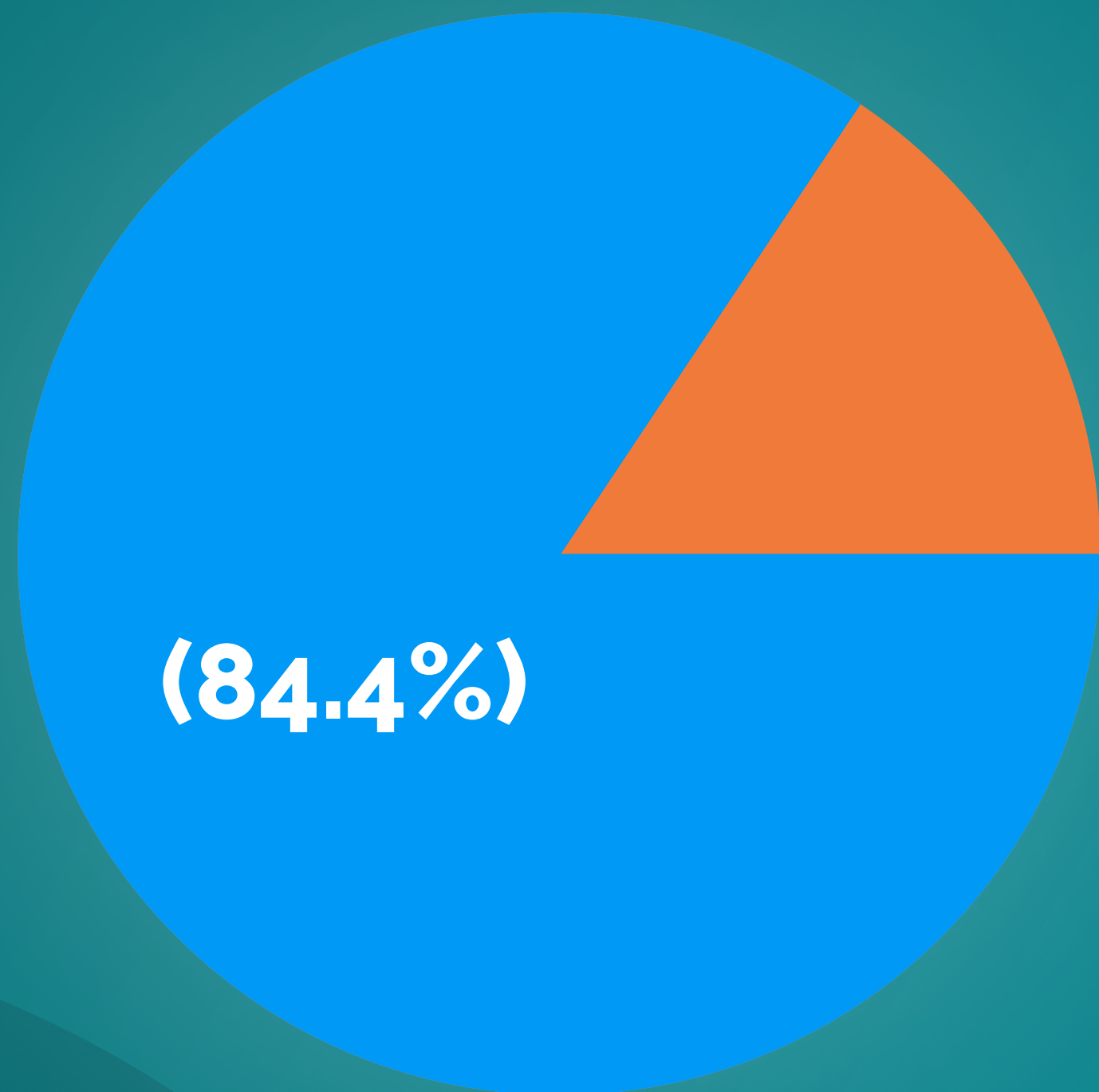


Yes: 4



No, I took it on by myself: 15

Users would say that nicotine decreases their stress level (84.4%).



Would you say that nicotine decreases your stress level?

- Yes, it does decrease my stress: 27
- No, it DOESN'T decrease my stress: 5

User Interviews: Round One

First Round Insights: Current Smoker

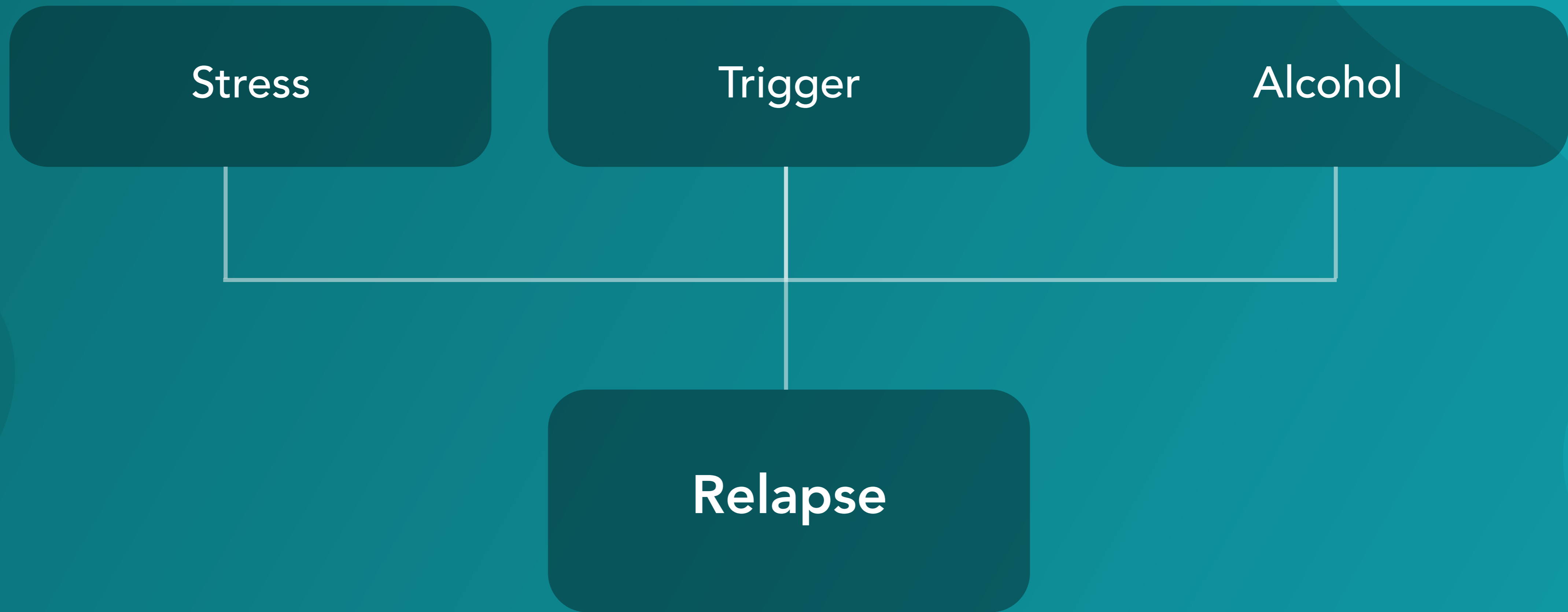
- Majority of users started smoking due to social and environmental aspects.
- Stress, anxiety, and alcohol trigger users to smoke.
- Users would want someone to hold them accountable when quitting.
- Smoking withdrawals alter your mental state.

“ I dont think smoking helps stress but it definitely makes me think it helps”

First Round Insights: Successfully Quit

- Started smoking in a social situation or party
- All of them started to smoke within an hour of waking up
- Having someone keep you accountable helps when quitting.

“Just being there for them and being that second voice saying you dont need it (smoking)”



We found that people's stress, their triggers and the consumption of alcohol are the 3 reasons of relapse

While social drinking events is the most difficult situation, someone has to overcome when trying to quit.

User Interviews: Round Two

Second Round Insights:

- Users smoke at home because it's habitual and private.
- If cravings aren't addressed they feel irritated, angry, stressed, and annoyed.
- Smoking distracts users in high stress situations.

"Smoking is harder to quit in high stress situations, although I'm not sure if smoking really helps me improve my situation"

"I use more as a crutch, it is more of a distraction than it actually reducing stress"

"It is a good excuse to get outside and escape from the situation."

Second Round Insights:

- Most users don't vape in front of respected peers.
- Users who prefer to quit smoking alone don't involve friends because of fear of judgement and future conflict

"Too many opinions, especially if it is someone who is constantly trying to micromanage my life"

"I don't want to put any pressure on my friends about the fact that I'm quitting"

Affinitization

134 Blues

34 Pinks

756 Yellow

12 Initial HMWs

6 Final HMWs



Some users **didn't have any concerns** about quitting and do not care **what their peers think about smoking**

x26



Users are **more at risk** to start smoking at younger age because they are more **easily influenced by social factors, stress, and media**

x65



Users smoking **habits** are **based off** their **surroundings** and the **triggers** they face throughout the day

x145



People **without a reliable method to cope** with stress are **more prone** to smoking/vaping, especially those who have **pre-existing mental health issues**

x41



Users can **successfully quit** by **avoiding triggers** like **stress and alcohol** coupled with the **support** from their community

x46



Some users will **not feel guilty about their nicotine** dependence even if it may affect their schedule

x51



Users had varying methods to **quit successfully** while also **avoiding environments** where they would be **triggered** to smoke

x56



The **quitting withdrawals**; cravings, irritability, and anxiety were difficult but I **coped with candy, music, and keeping myself busy.**

x52



Because users **started smoking** with cigarettes or other nicotine devices, they would be **interested in nicotine** alternative products to **help them quit** on their own

x48



Some users felt as if **quitting on their own** would be best, however majority said they would have **no opposition to** being **encouraged** by their peers or **receiving support** from strangers or counselors

x133



Users have clear **preferences on who they will and won't smoke around**, which leaves a significant impact on social relationships

x24



Users feel **motivated to quit** for personal health, social relationships, and the financial **benefits of no longer smoking**

x77



chapter 2

Define

Overarching HMW

How might we create a product to detect user's emotions and provide insights on their environmental triggers to motivate them to facilitate change?

Sub HMWs

HMW develop a product that visualizes user insights on their emotional and environmental triggers to aid smoking cessation?

HMW create empathy for users in social environments that pressures or triggers them to smoke, such as stress or alcohol?

HMW create a product that enables users to quit smoking alone while also providing an empathetic community of family, friends, strangers, or counselors to create a system of accountability?

HMW empathize with user's mental health by creating a reliable system to cope while also educating users on the impacts that smoking has on their health, social, and financial life.

HMW develop a product that aids users who are more at risk for smoking due to social and academic stress, while inspiring them to care about the long-term effects of smoking?

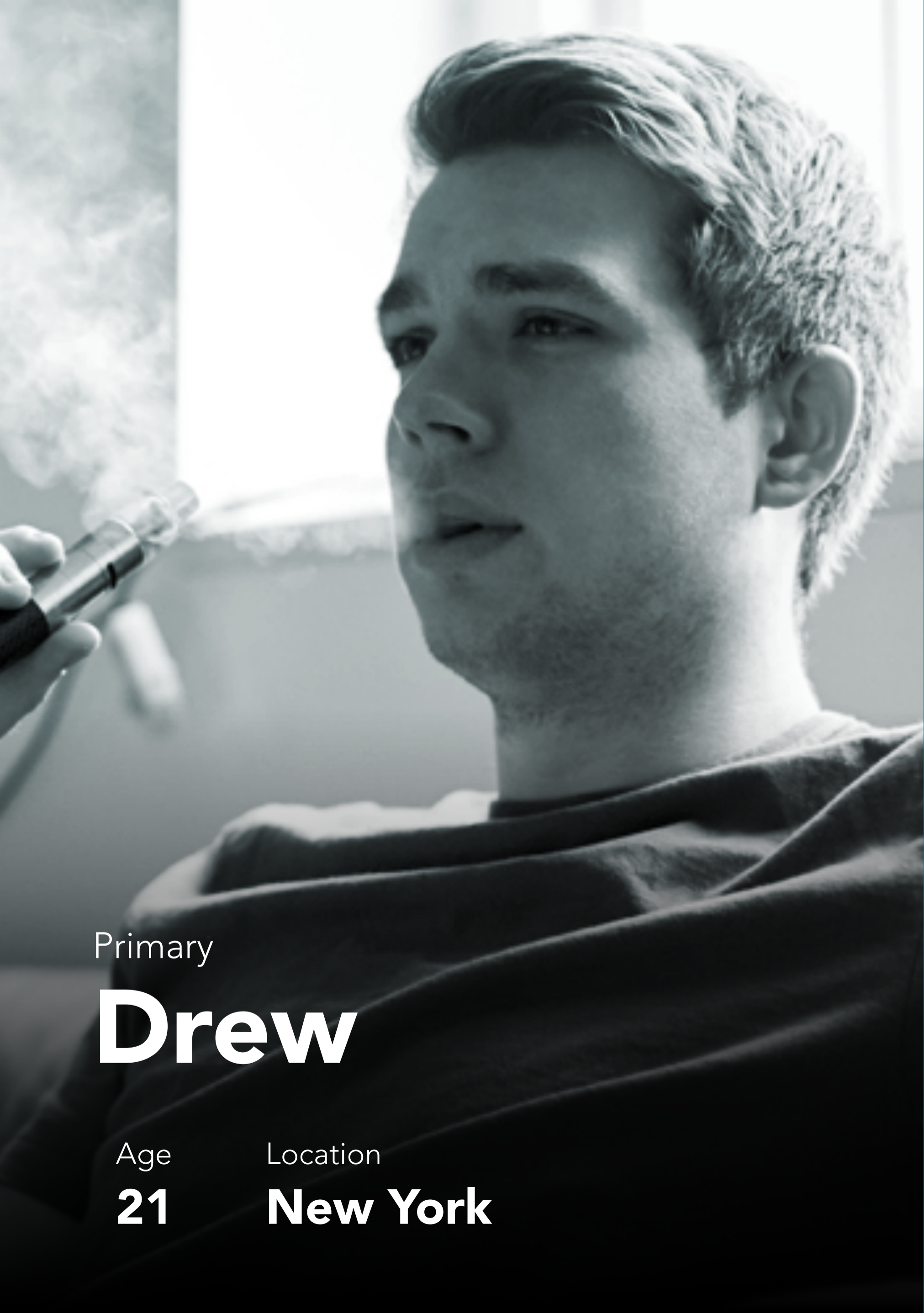
How does
this relate to
empathy?



Using Empathy to Treat Addiction

Empathy is the ability to understand and relate to the emotions of others. It is the key component in successful, **long-term recovery**.

Empathy sets a solid foundation for many of our relationships throughout life – whether with family, friends or even colleagues. It also plays an essential role as you continue on the path to long-term recovery and sobriety.



Primary

Drew

Age

21

Location

New York

Biography

Drew is a sophomore college student, who has been addicted to nicotine since his junior of high school. He started smoking only because all of his friends were, and didn't realize the effects it would have on his health. He has tried to quit multiple times, but hasn't been able to overcome his triggers and withdrawals. During his quitting attempts he's relapsed at parties when all of his peers expect him to smoke. He wants accountability, but is scared to ask his friends who smoke to help him.

Drew's Frustrations

- Has no one to ask for help to quit
- In social situations peers expect him to smoke
- Symptoms of withdrawals

Drew's Needs

- Accountability
- Overcoming triggers and withdrawals
- Healthy coping mechanisms

Drew Personality





Drew's Current Journey



Do	Throws out Juul and cigarettes to help quit smoking.	Suffering headaches from nicotine withdrawals, and craving his Juul from being stressed out from his school work.	Withdrawals only get worse and starts suffering from insomnia on top of constant headaches.	Withdrawals start to slowly get a little better with every day that goes by.	Goes to a party, and relapses when his friends ask him if he wants to smoke.	After smoking the night before, his withdrawals come back and to start the process all over again.	Buys another Juul, tired of the withdrawals and thinking he can't overcome his triggers.
Think	<p>"I'm actually going to quit smoking this time"</p> <p>"If I don't have my juul and cigarettes I won't relapse"</p>	<p>"I wish I could hit my Juul more than anything right now"</p> <p>"The withdrawals can only get better from here"</p>	<p>"How am I going to get through the day"</p> <p>"Is this going to keep getting worse"</p>	<p>"I still feel horrible, but it's becoming more bearable"</p>	<p>"I'll just smoke this one night"</p> <p>"I feel amazing without the withdrawals"</p>	<p>"I didn't know smoking one night would make all the worst withdrawals come back"</p> <p>"Am I actually going to be able to do this"</p>	<p>"I'll just quit later, I this will be such a long grueling process"</p> <p>"What's another few months or year"</p>
Feel	Determined, Focused	Stressed, Frustrated	Tired, Stressed	Motivated	Relieved	Stressed, Frustrated	Complacent

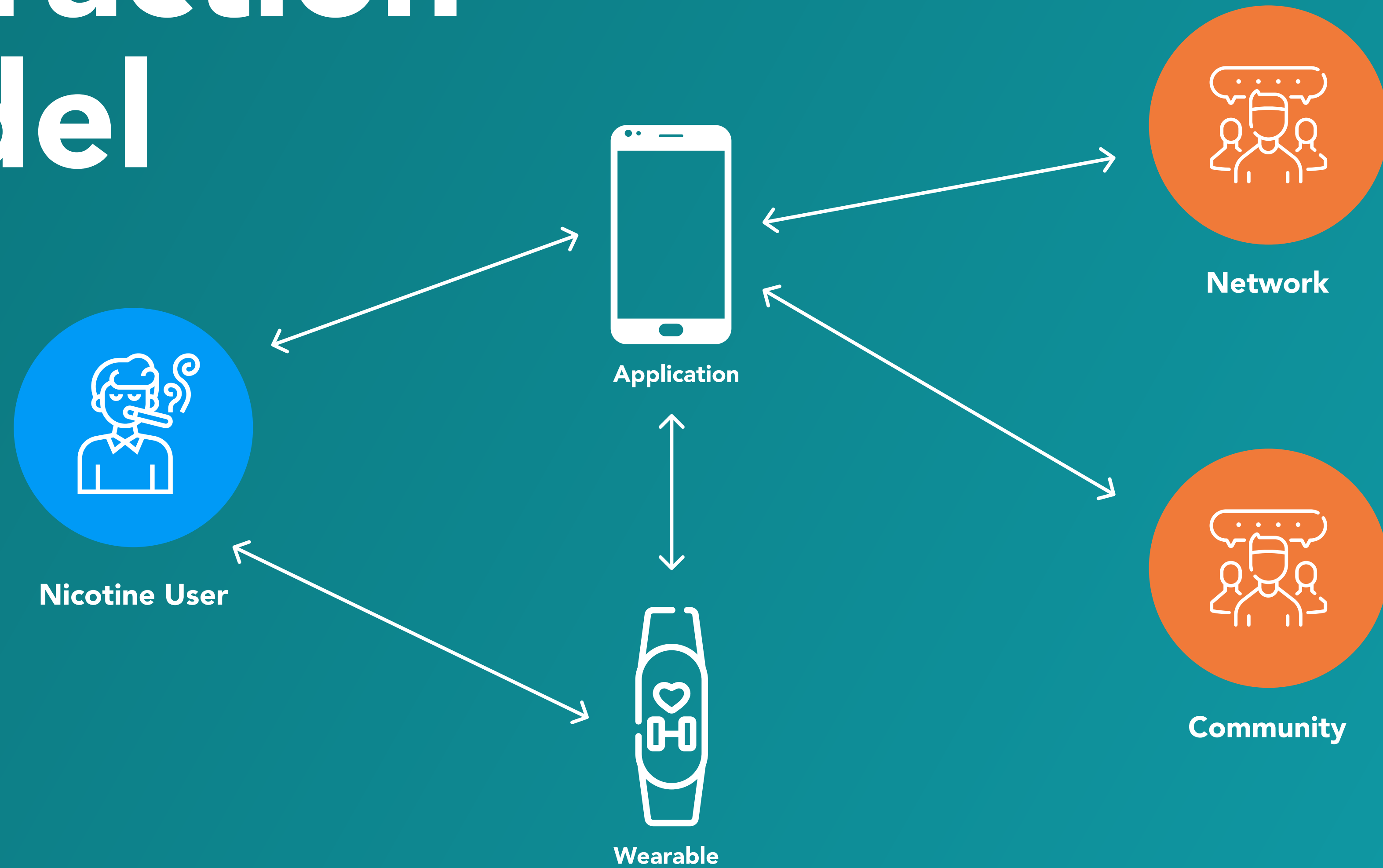
Opportunities

Hold the user accountable for relapse, and allow them to use their social network for support.

Provide positive reassurance and encouragement to users after no longer smoking for a few days.

Allow users to pin trigger points, and have their social network be notified when the wearable smoke detector goes off.

Interaction Model





Wearable Device

Features:

- Alarm/Reminder
- Gps Button
- Smoke Detector, HRV (heart rate variability), Wifi



Charging Station

Features:

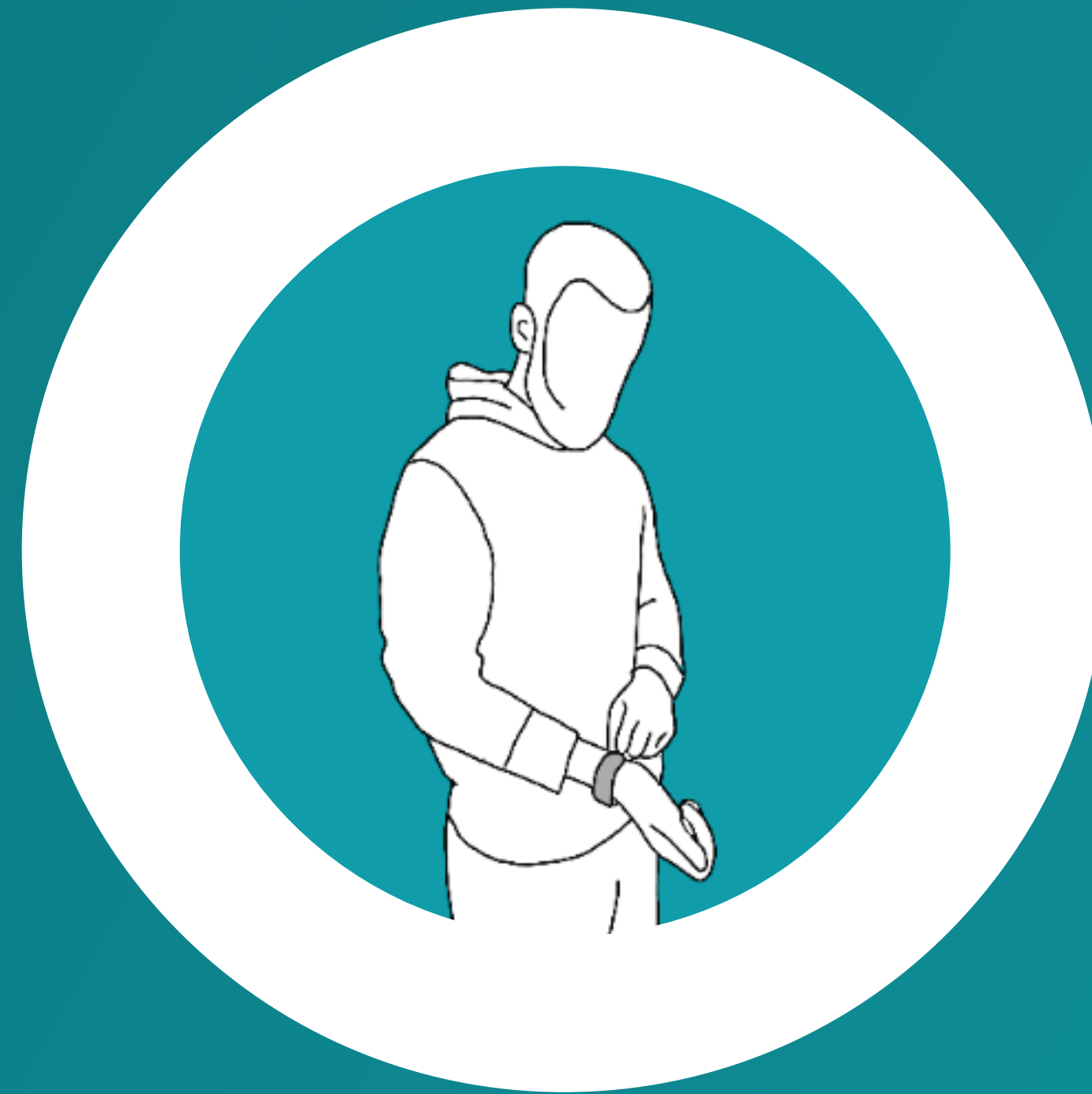
- Charging
- Avatar/Character
- GSR (Galvanic Skin Response)



Phone Application

Features:

- Social Connection
- Pattern trigger Locations
- Automated Counselor
- Anonymous Chat



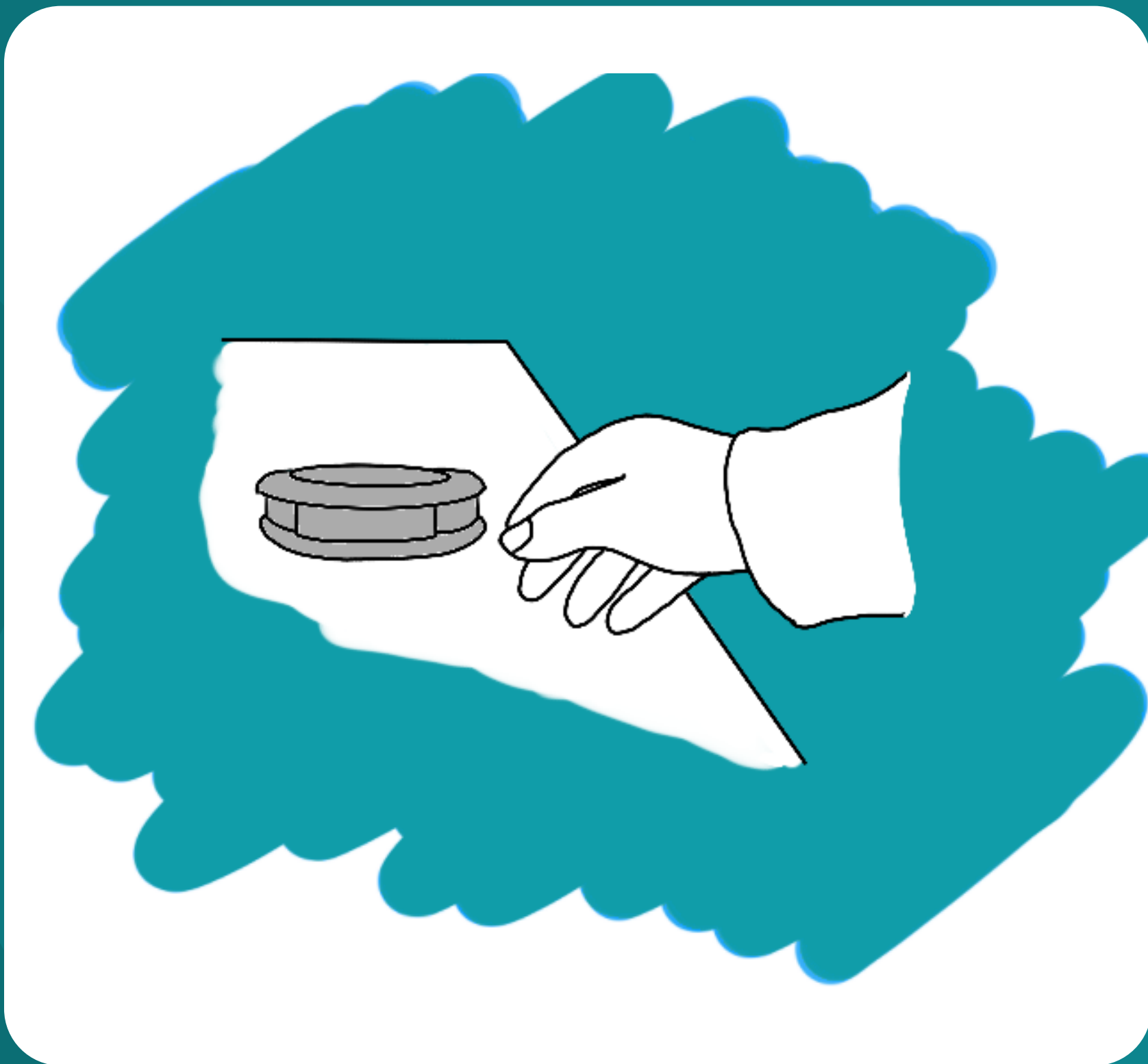
Drew's journey to successfully quitting his nicotine addiction.



After deciding to quit nicotine, Drew throws out his juul and cigarettes.



Immediately Drew started suffering from the nicotine withdrawals.



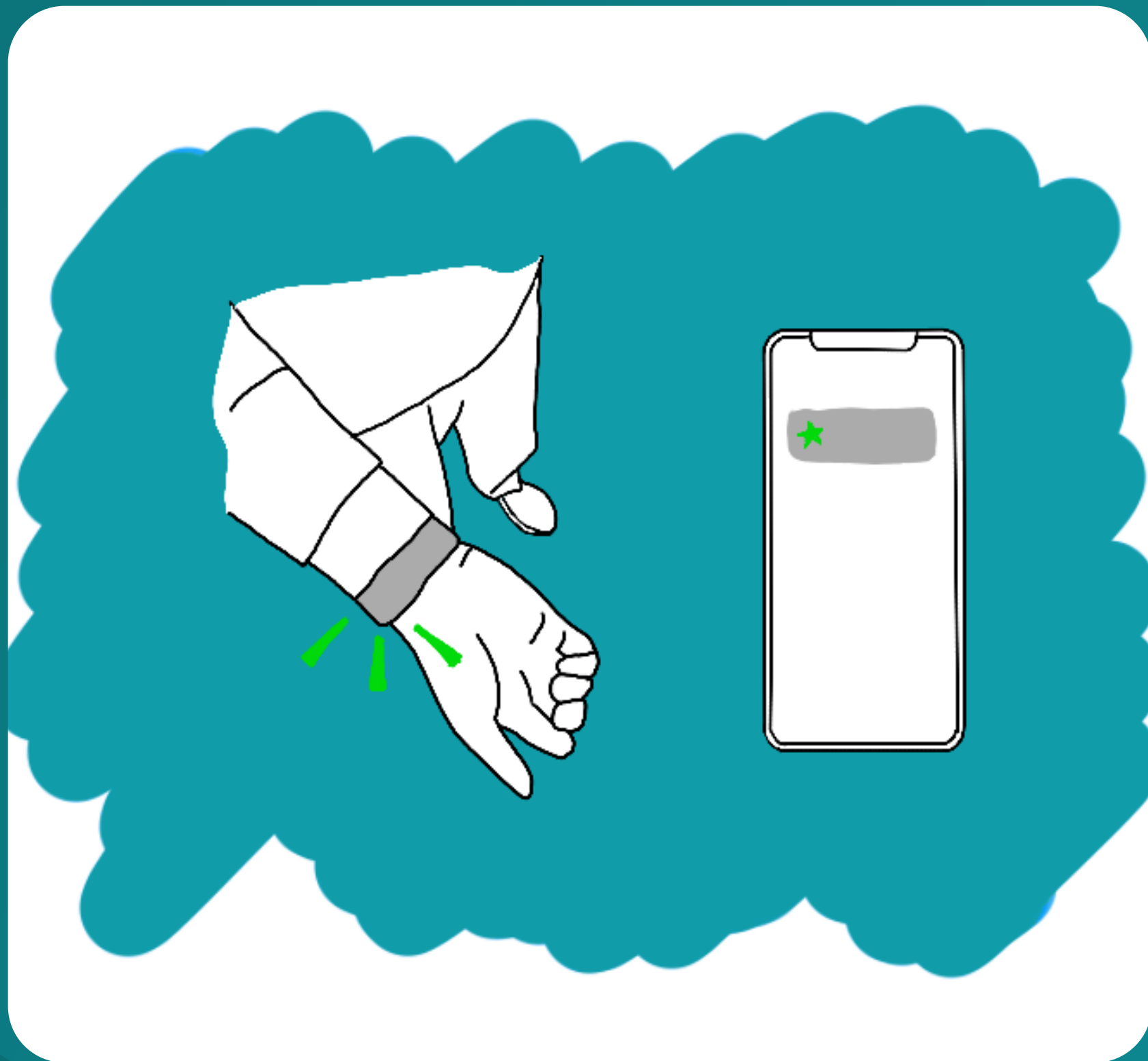
To help fight his addiction,
Drew gets his wristband
from the home pod to
prevent a relapse



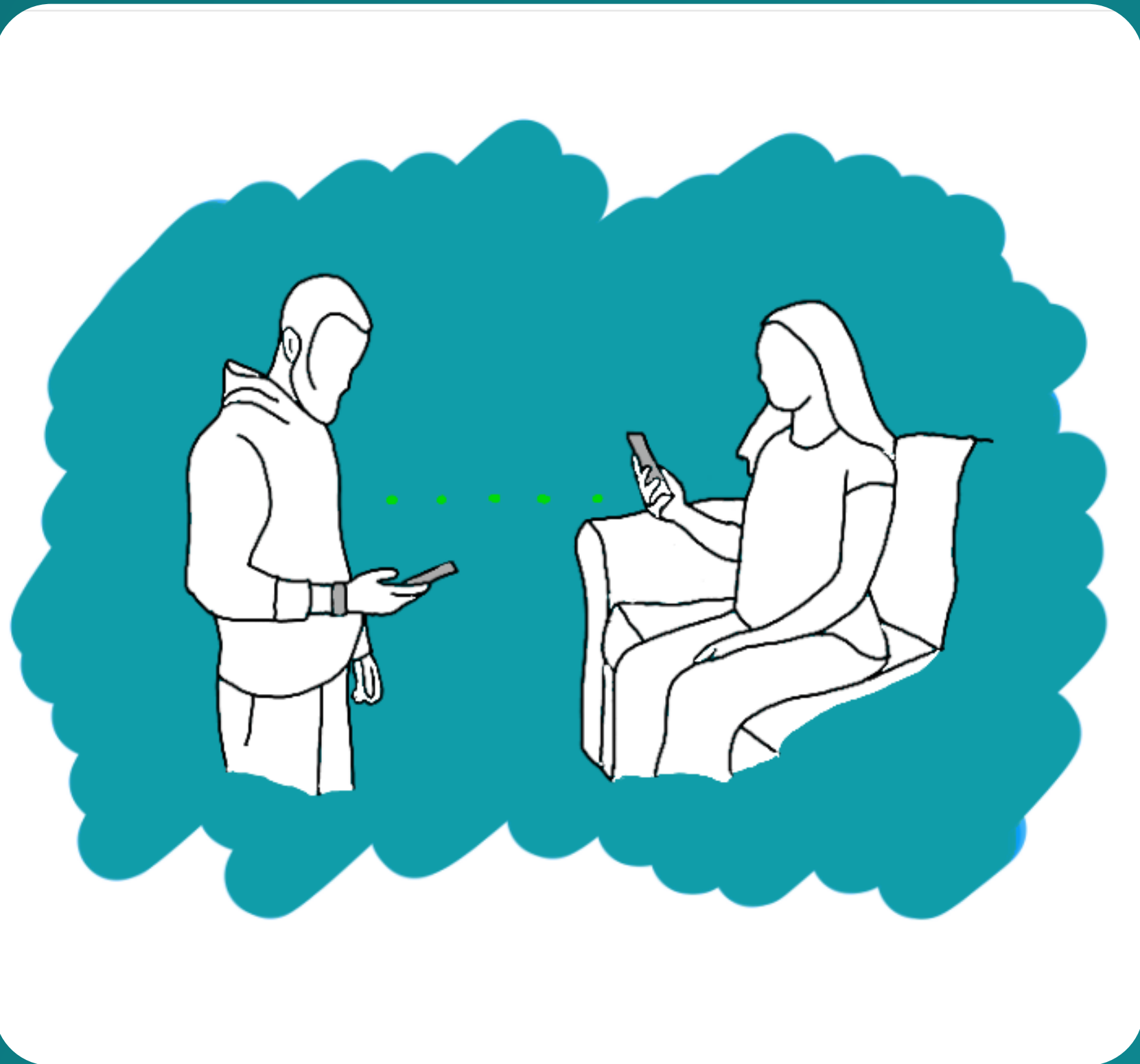
Later that night, Drew goes to a party and is offered a vape from his friend.



Drew pushes the button on his wristband to mark the location where he is triggered, and his phone pins it on the app.



At the party the smoke detector on his wristband goes off and alerts his phone.



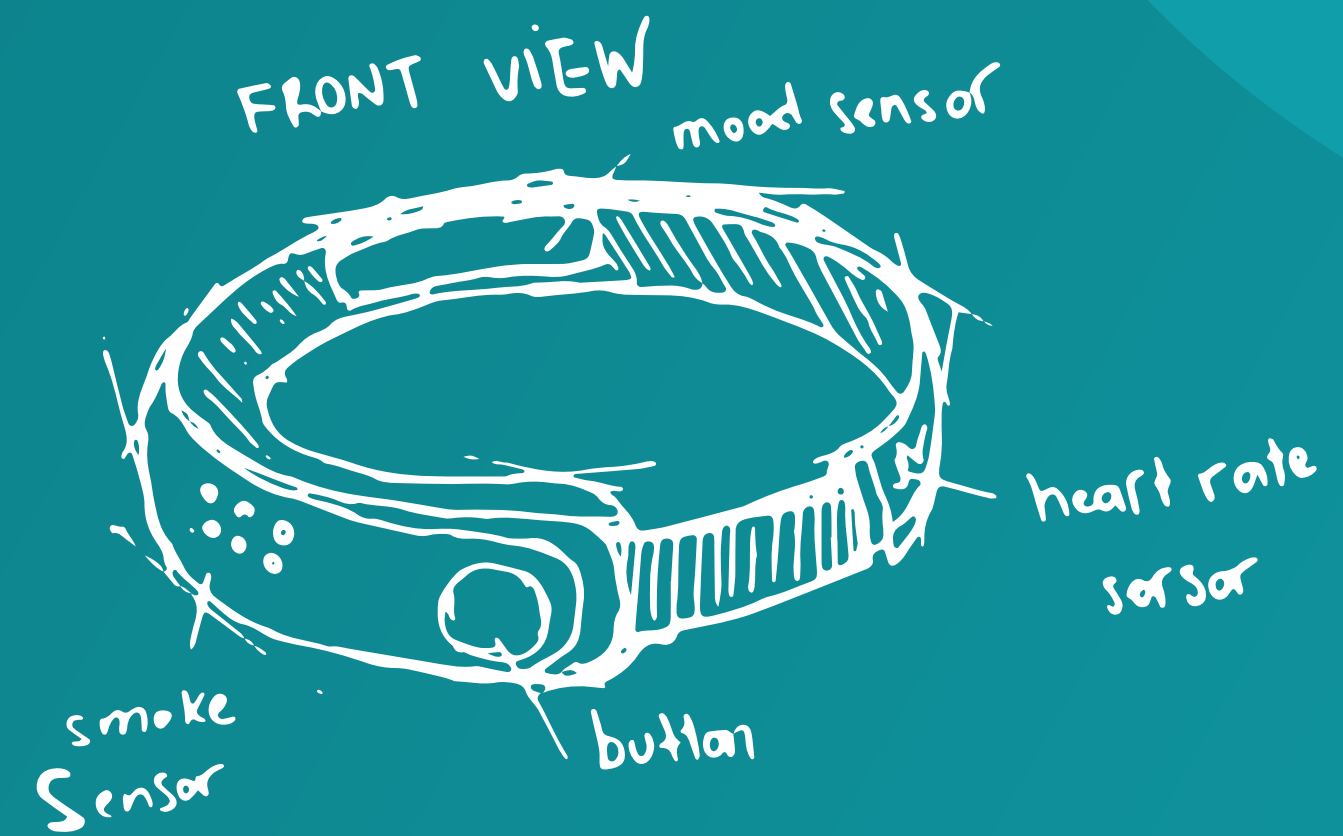
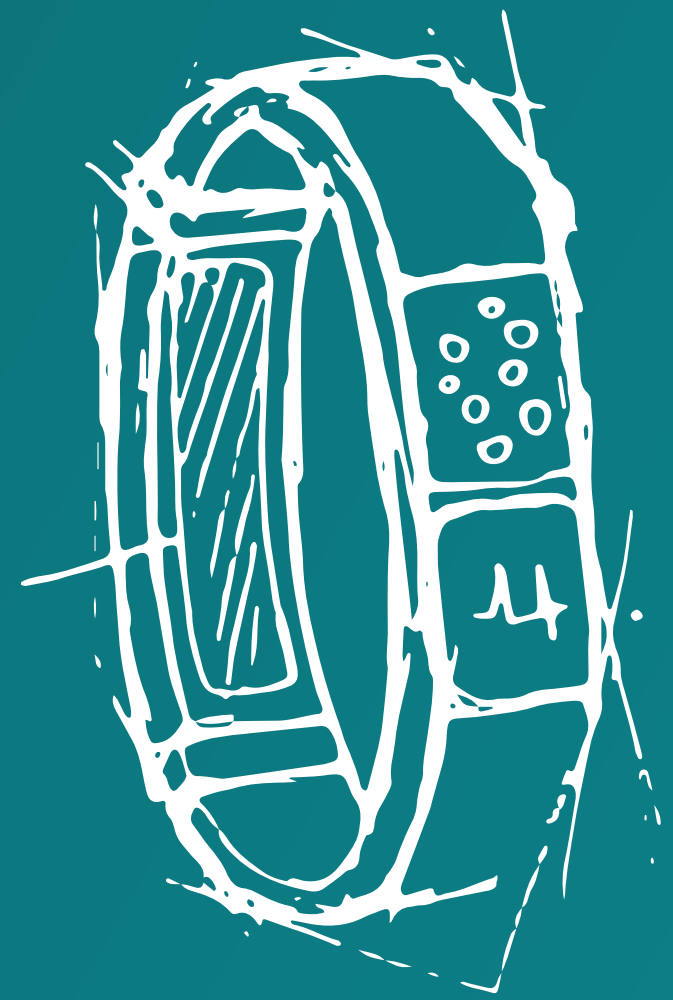
Drew's friend sees his situation and texts him to check in and hold him accountable.



Drew can now
successfully quit smoking
by seeing all his triggers.

Product Concept





Since smoking rates have continued to rise among young adults, our group decided to effectively combat this issue with a product based solution.

Gorb-E is a wearable device that works in tandem with our application to implement a system of empathic support and accountability.



Gorb-E would be gathering insights on our user's physiological states to better help them understand their unique triggers in their day to day life.

Gorb-E will have a heart rate sensor that identifies heightened emotions, a Galvanic Skin Response (GSR) sensor that will track skin condensation, and have a button that they can press when faced with a trigger.

Introducing **Gorby**



Purpose of Gorby

To project identity to the avatar
people can emphasize on Gorby

Default persona of Gorby

Stern, friendly and compassionate
Default emotion: Happy

Tasks Gorby will provide

Display different emotions and review insights
Maintain eye contact interaction with users



App Concept



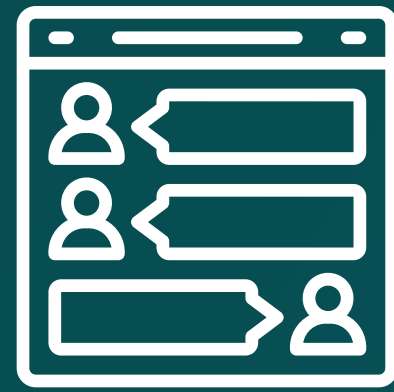
The application works in tandem with the wearable. The application extends the experience of our users recovery.

Here they can make friends who can empathize with their situations, post on the forum about specific topics.

Such as cravings or social situations, review their recovery insights, and earn achievements from their Gorby.

App Features





Meet people in the forum to
add to your gorby lobby



Review your triggers, insights,
and mood history



Gain achivements to rank up
your in app Gorby

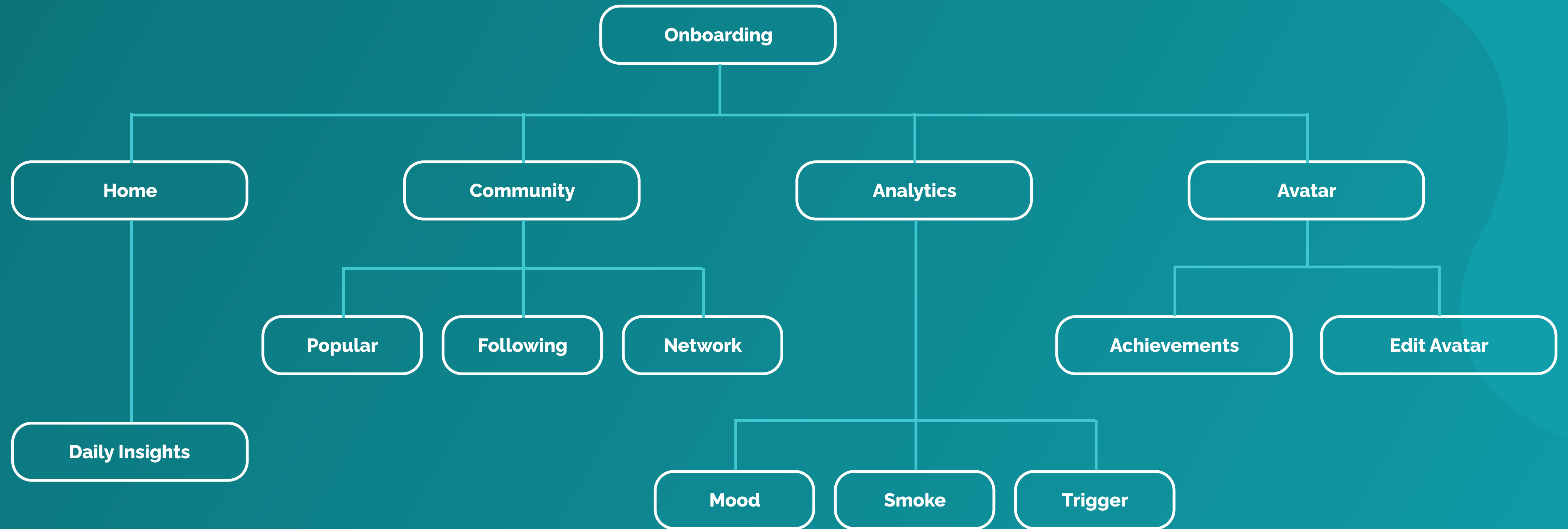


Recieve advice during
triggered events or highted
emotional states



Stay accountable

Site Map



In-app Achievements Ideation

Consecutive days of
smoke detector not
going off

Daily login streak

Logging their
triggers or cravings

Going to trigger
locations and not
having the smoke
detector triggered

Posting or making
comments on a forum

Adding users to
their network from
the forum

Reviewing insights
with Gorby

Messaging users from
their network

Key Aspects



Accountability



Smoke detection on wearable product.

Triggers



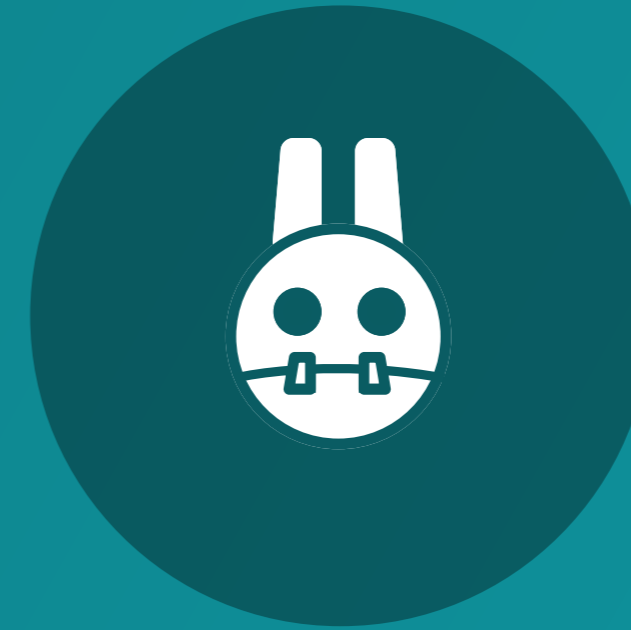
Pin trigger locations on map through app.

Emotions



Heart Rate & Skin Temp sensor on wearable product.

Motivation



Gamification through mobile app with Gorby.

Empathy



Providing community through mobile app.

Through the app, we will allow users to connect with their friends, family, or even strangers to help them through the process. This is where empathy plays the biggest role. From our research, we found that many of our users would actually prefer connecting with strangers. They feel that they can be just as empathic at their peers family and friends all while not making things more complicated in their personal life.



3 Senarios



1. Hightened Emotional State

If the wearable detects a highted emotion through the GSR componet and the heart rate sensor you will recive a pin notification to open your app and update the application (mood). This is where you will be told that you are experiecing a hightened emotion and the user will be asked to pick which hightened emotion they are experience.



2. Smoke Sensor

If the wearable detects smoke through the smoke sensor component you will receive a pin notification to open your app and review if it was you smoking or someone in your surroundings.



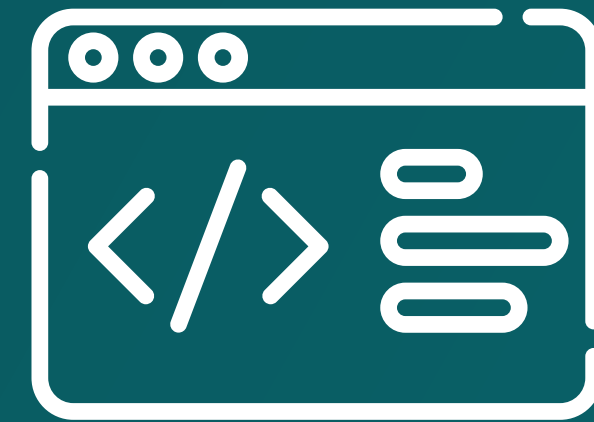
3. Pressed Trigger Button

If the trigger button is pressed on the wearable it will prompt you to answer which trigger you are being faced with. If it is an inconvenient time to log a trigger you can log it later where the next time you open the application it will remind you to log it.

chapter 3

Design

Arduirino Programming



Heart Rate Sensor

The LED light was on everytime when there was a heart beat

```
23:50:33.100 -> A HeartBeat Happened !
23:50:33.133 -> BPM: 110
23:50:33.500 -> A HeartBeat Happened !
23:50:33.534 -> BPM: 116
23:50:34.012 -> A HeartBeat Happened !
23:50:34.046 -> BPM: 121
23:50:34.385 -> A HeartBeat Happened !
23:50:34.385 -> BPM: 129
23:50:34.895 -> A HeartBeat Happened !
23:50:34.929 -> BPM: 134
23:50:35.236 -> A HeartBeat Happened !
23:50:35.270 -> BPM: 136
23:50:35.745 -> A HeartBeat Happened !
23:50:35.778 -> BPM: 136
23:50:36.083 -> A HeartBeat Happened !
23:50:36.116 -> BPM: 138
23:50:36.590 -> A HeartBeat Happened !
23:50:36.590 -> BPM: 140

Getting_BPM_to_Monitor $
#define USE_ARDUINO_INTERRUPTS true // Set-up low-level interrupts for most accurate BPM math.
#include <PulseSensorPlayground.h> // Includes the PulseSensorPlayground Library.

// Variables
const int PulseWire = 0; // PulseSensor PURPLE WIRE connected to ANALOG PIN 0
const int LED13 = 13; // The on-board Arduino LED, close to PIN 13.
int Threshold = 550; // Determine which Signal to "count as a beat" and which to ignore.
// Use the "Getting Started Project" to fine-tune Threshold Value beyond default setting.
// Otherwise leave the default "550" value.

PulseSensorPlayground pulseSensor; // Creates an instance of the PulseSensorPlayground object called "pulseSensor"

void setup() {
  Serial.begin(9600); // For Serial Monitor

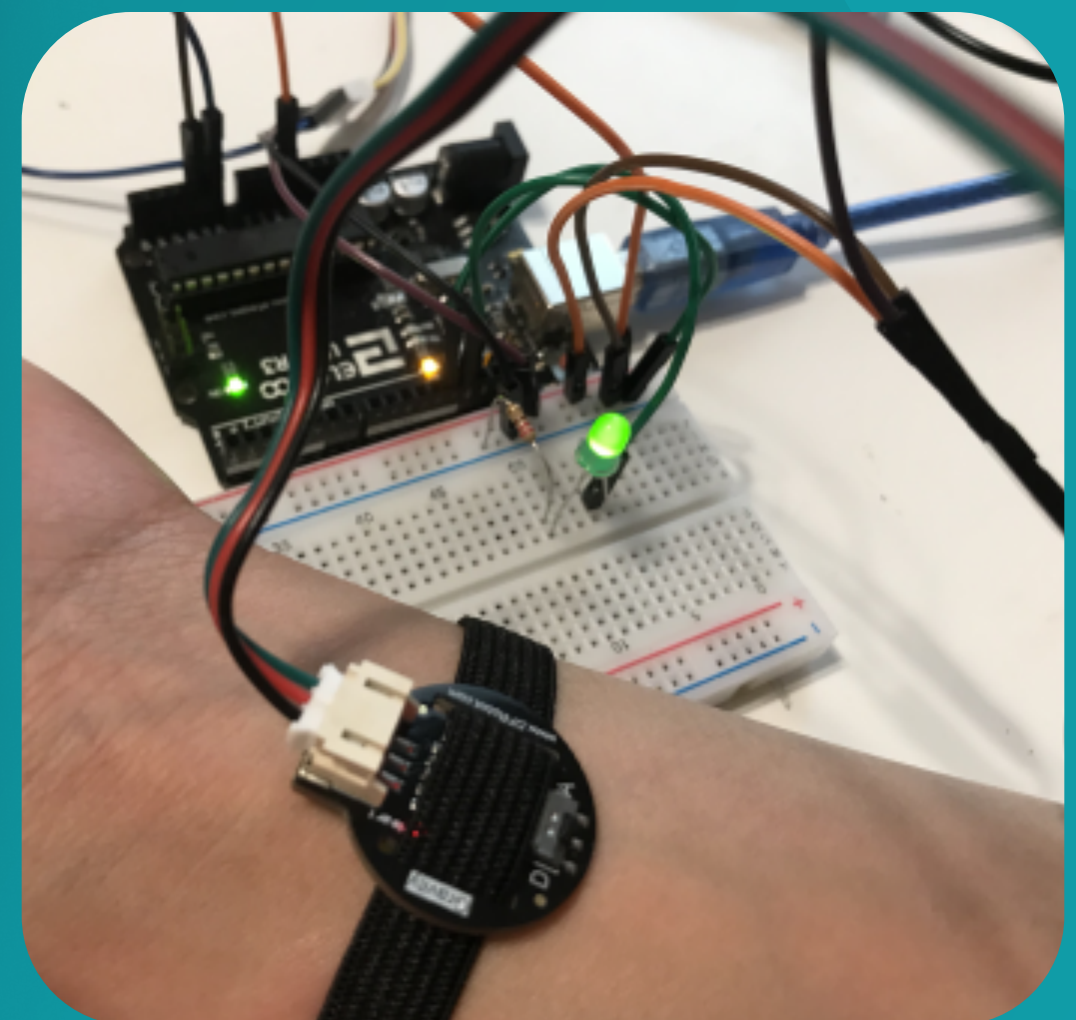
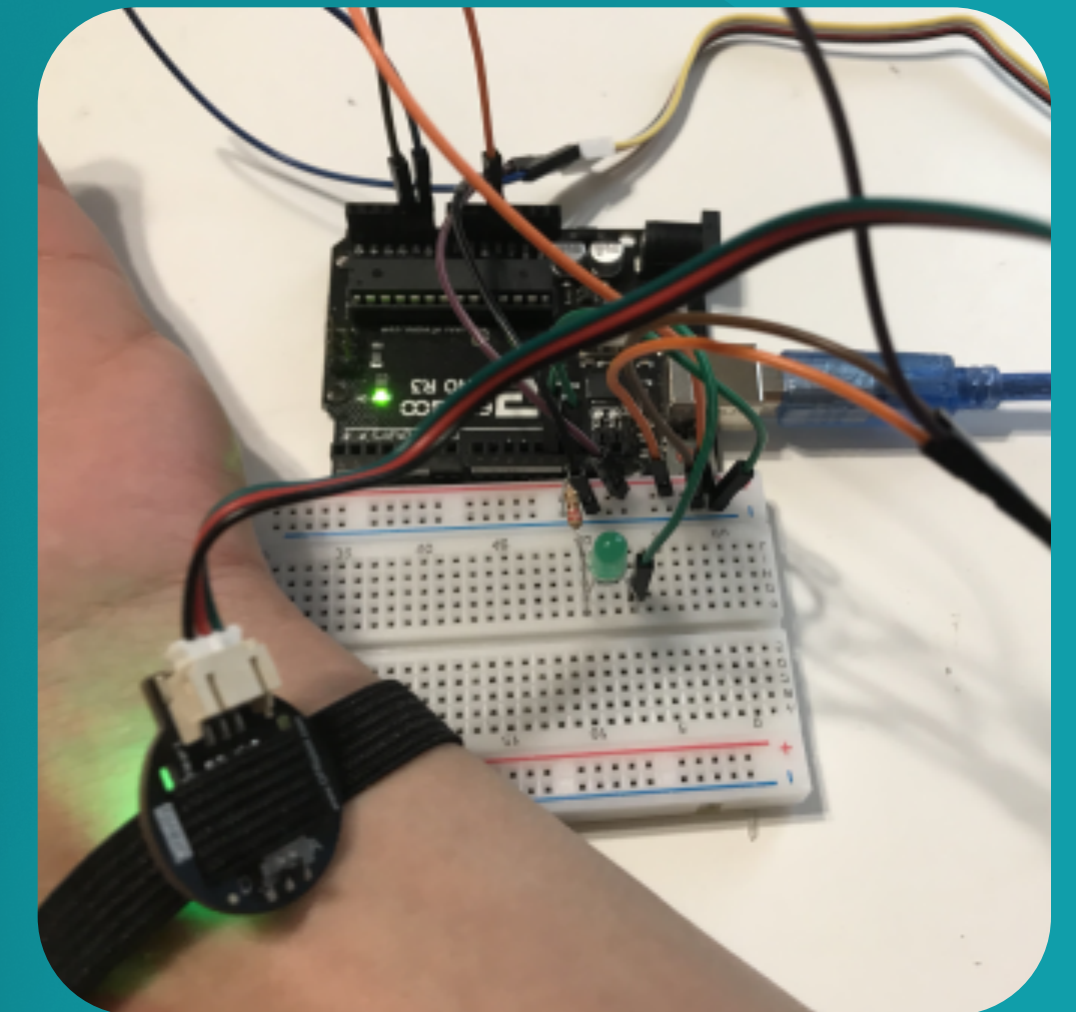
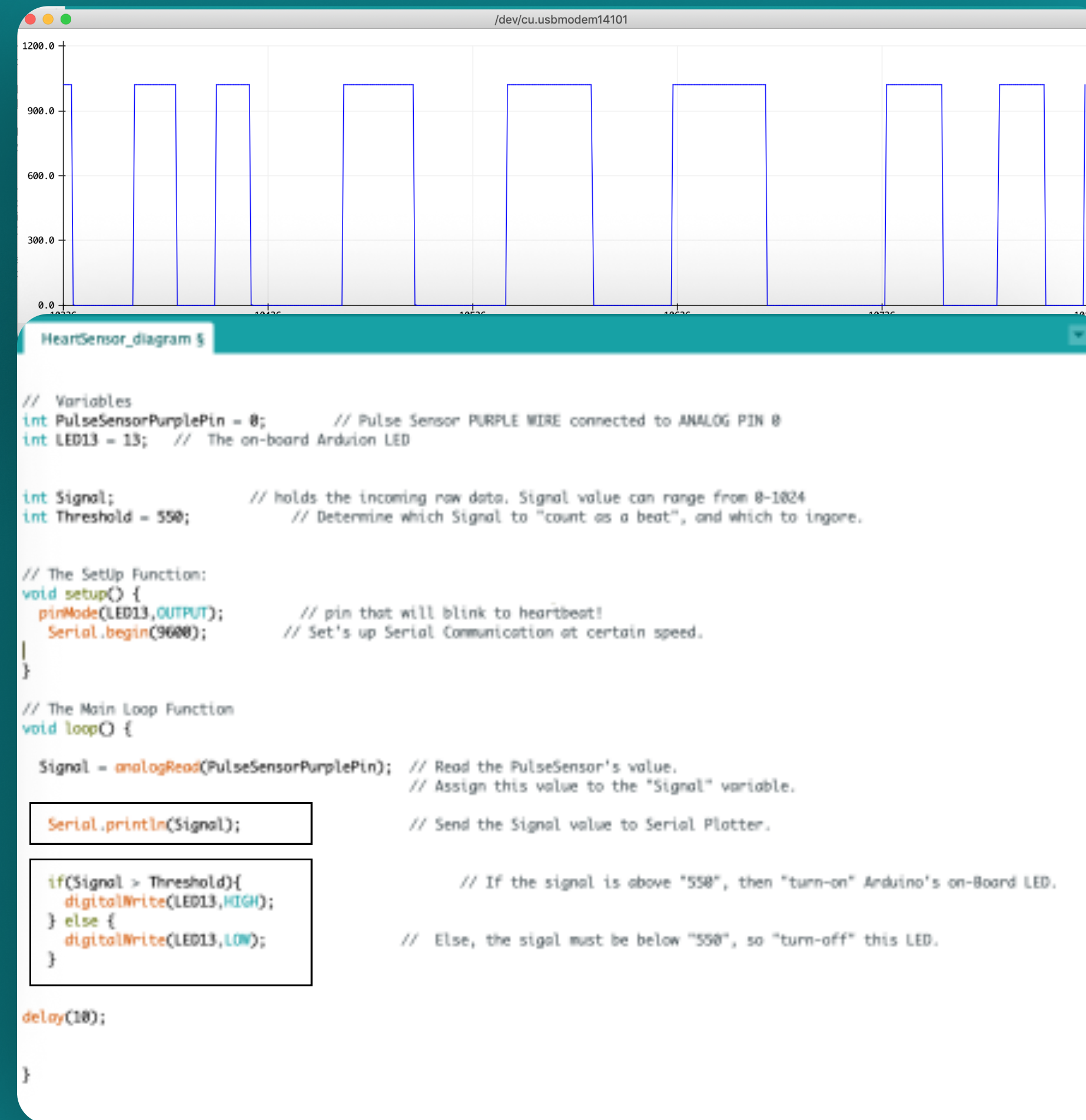
  // Configure the PulseSensor object, by assigning our variables to it.
  pulseSensor.analogInput(PulseWire);
  pulseSensor.blinkOnPulse(LED13); // auto-magically blink Arduino's LED with heartbeat.
  pulseSensor.setThreshold(Threshold);

  // Double-check the "pulseSensor" object was created and "began" seeing a signal.
  if (pulseSensor.begin()) {
    Serial.println("We created a pulseSensor Object !"); // This prints one time at Arduino power-up, or on Arduino reset.
  }
}

void loop() {
  int myBPM = pulseSensor.getBeatsPerMinute(); // Calls function on our pulseSensor object that returns BPM as an "int".
  // "myBPM" hold this BPM value now.

  if (pulseSensor.sawStartOfBeat()) { // Constantly test to see if "a beat happened".
    Serial.println("♥ A HeartBeat Happened !"); // If test is "true", print a message "a heartbeat happened".
    Serial.print("BPM: "); // Print phrase "BPM: "
    Serial.println(myBPM); // Print the value inside of myBPM.
  }

  delay(20); // considered best practice in a simple sketch.
}
```



Smoke Sensor | 1st Experiment

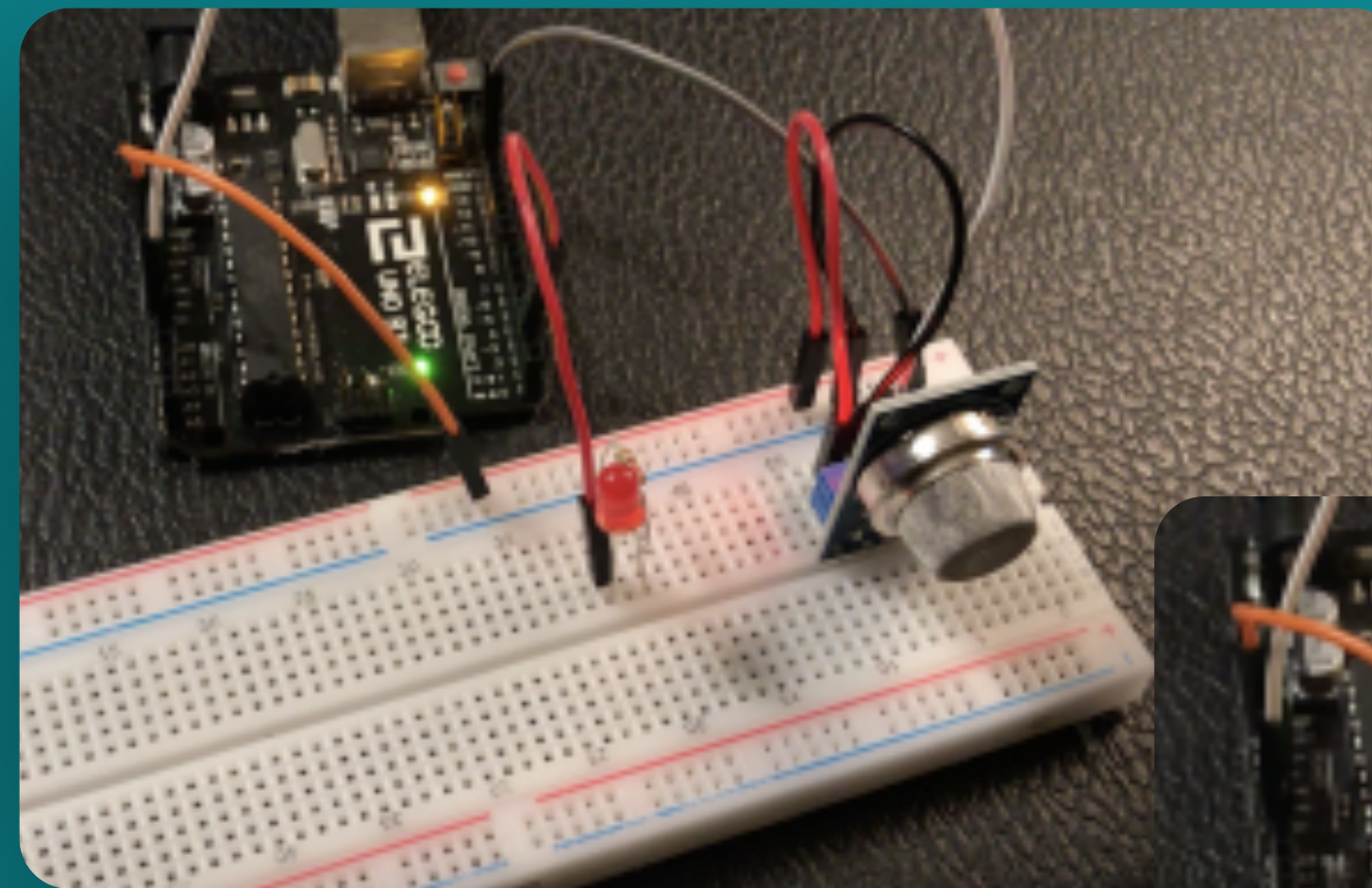
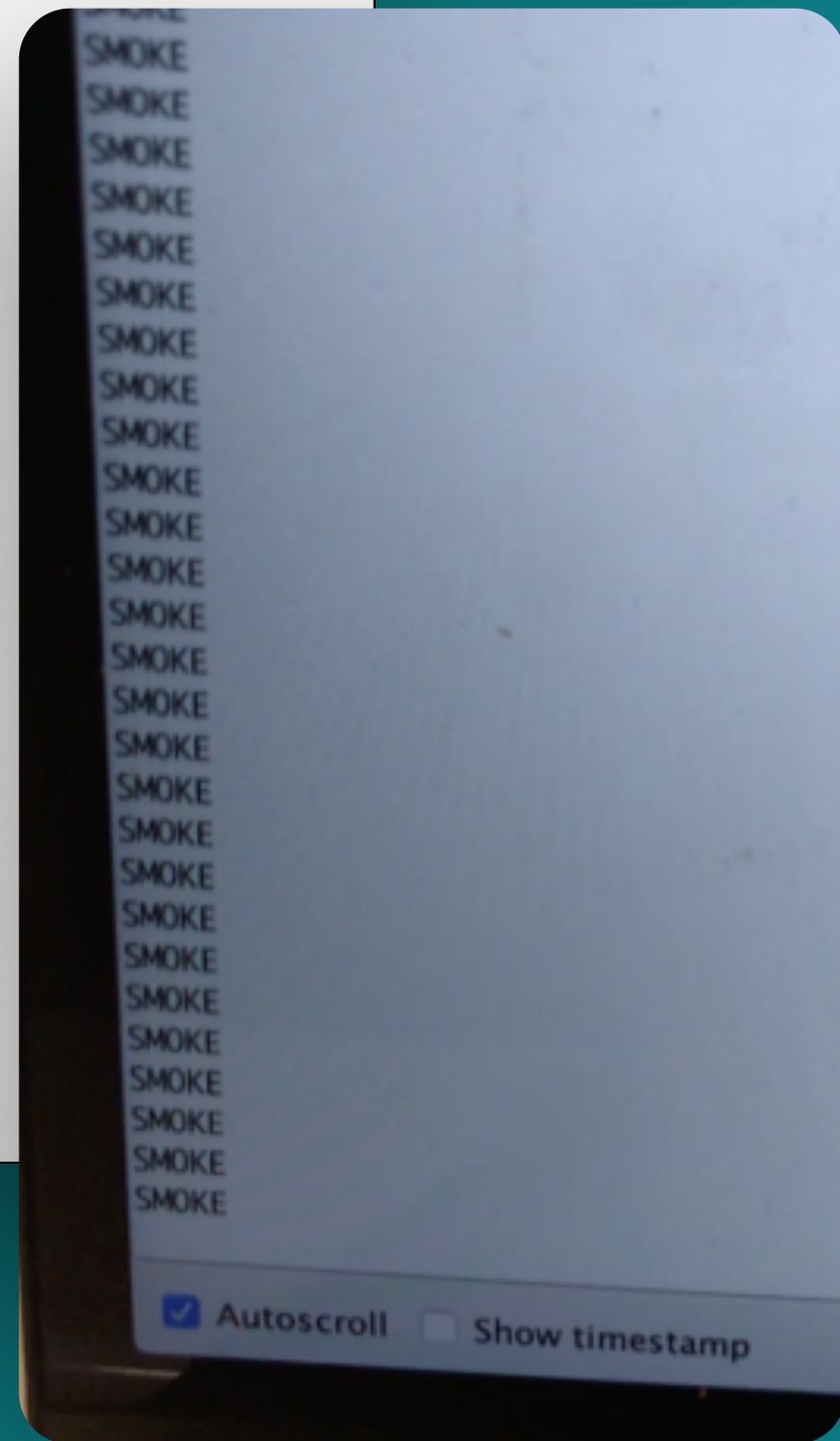
```
Simple_Smoke_Sensor §
int smokeA0 = A0;
int redLed = 2;
// threshold value
int sensorThres = 400; // Sensitive threshold

void setup() {
  pinMode(smokeA0, INPUT);
  pinMode(redLed, OUTPUT);
  Serial.begin(9600);
}

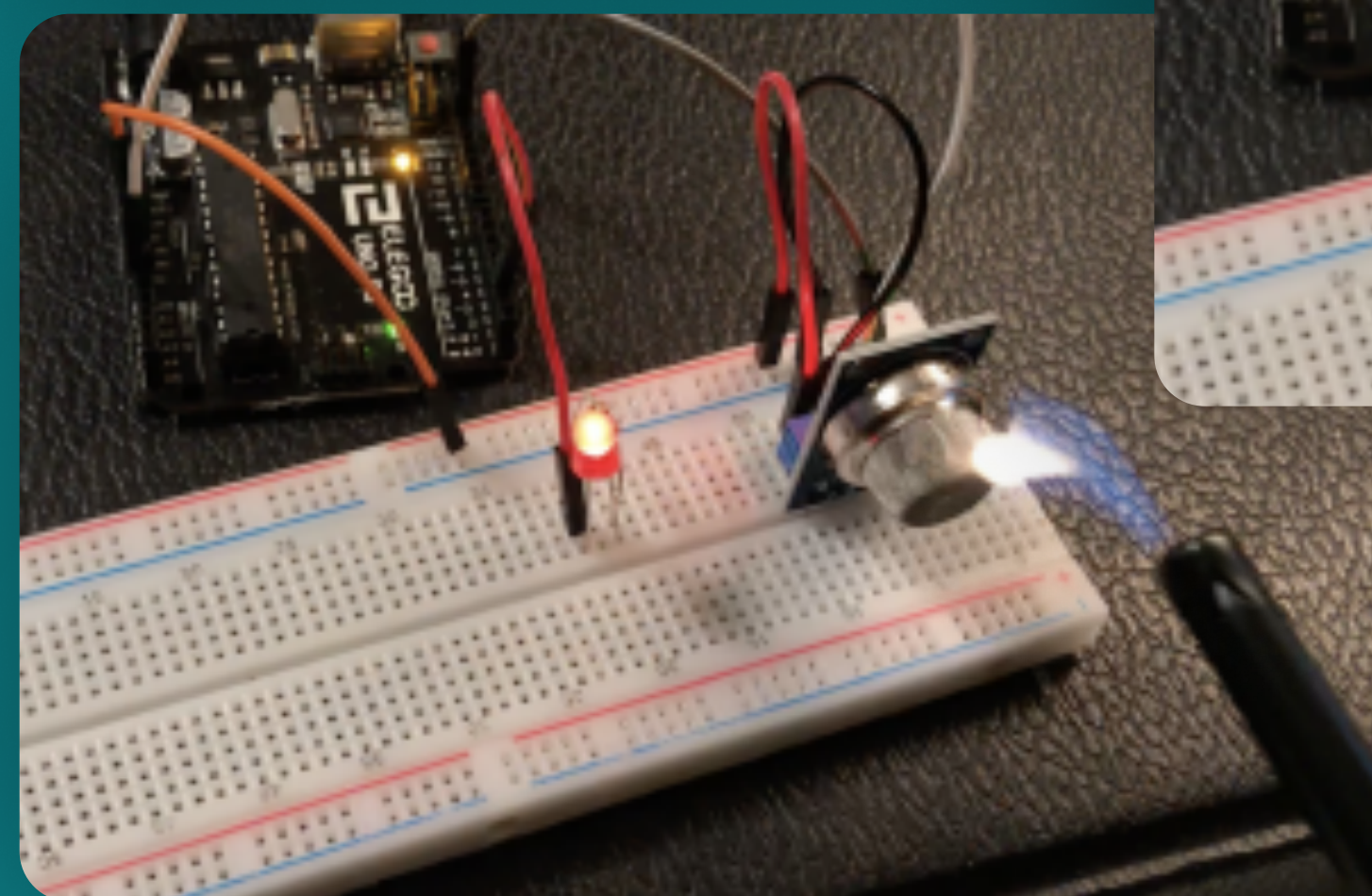
void loop() {
  int analogSensor = analogRead(smokeA0);

  // Serial.print("Pin A0: ");
  // Serial.println(analogSensor);

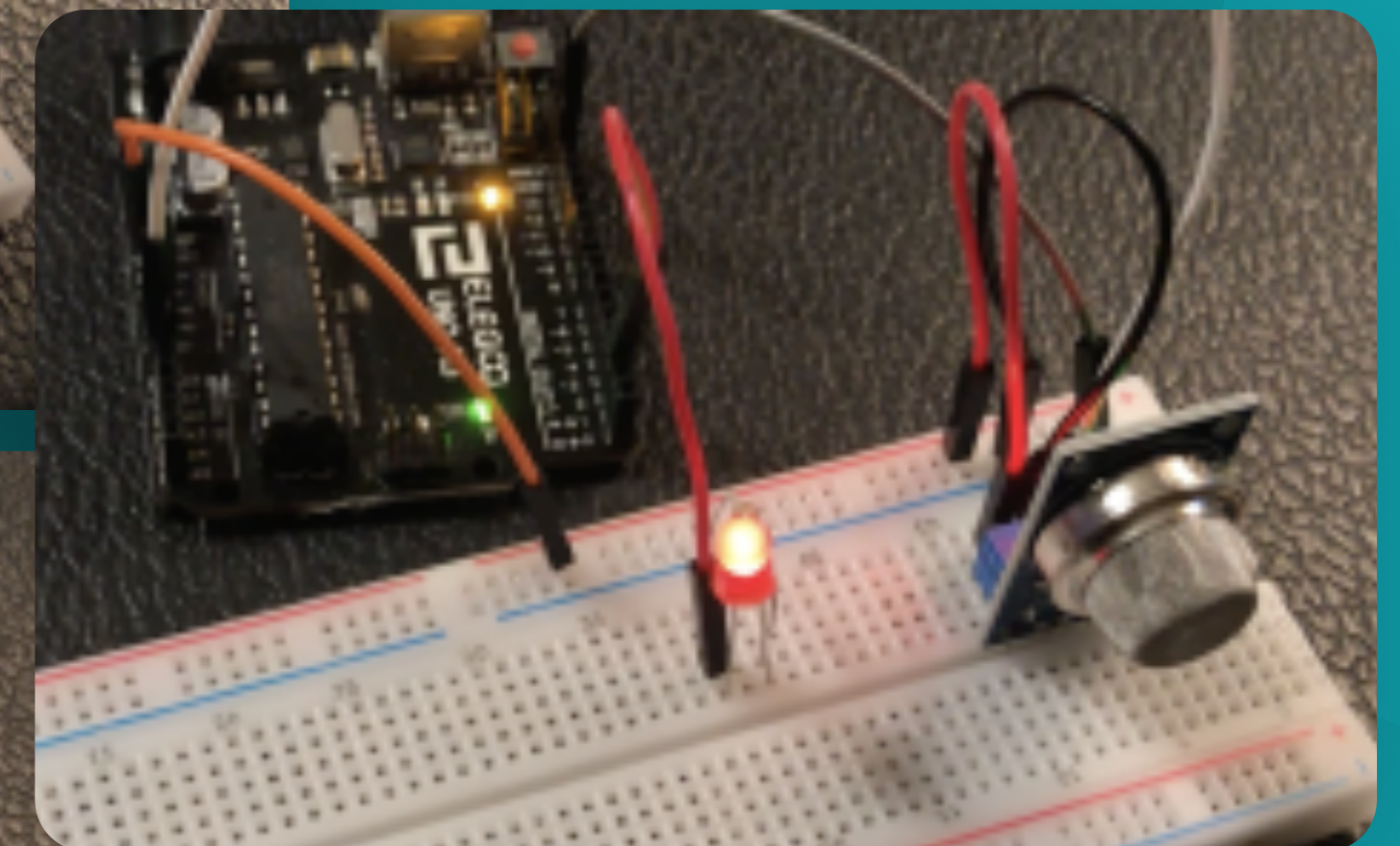
  if (analogSensor > sensorThres)
  {
    Serial.println("SMOKE");
    digitalWrite(redLed, HIGH);
  }
  else
  {
    digitalWrite(redLed, LOW);
  }
  delay(100);
}
```



1 The LED light was off when there was no smoke or gas

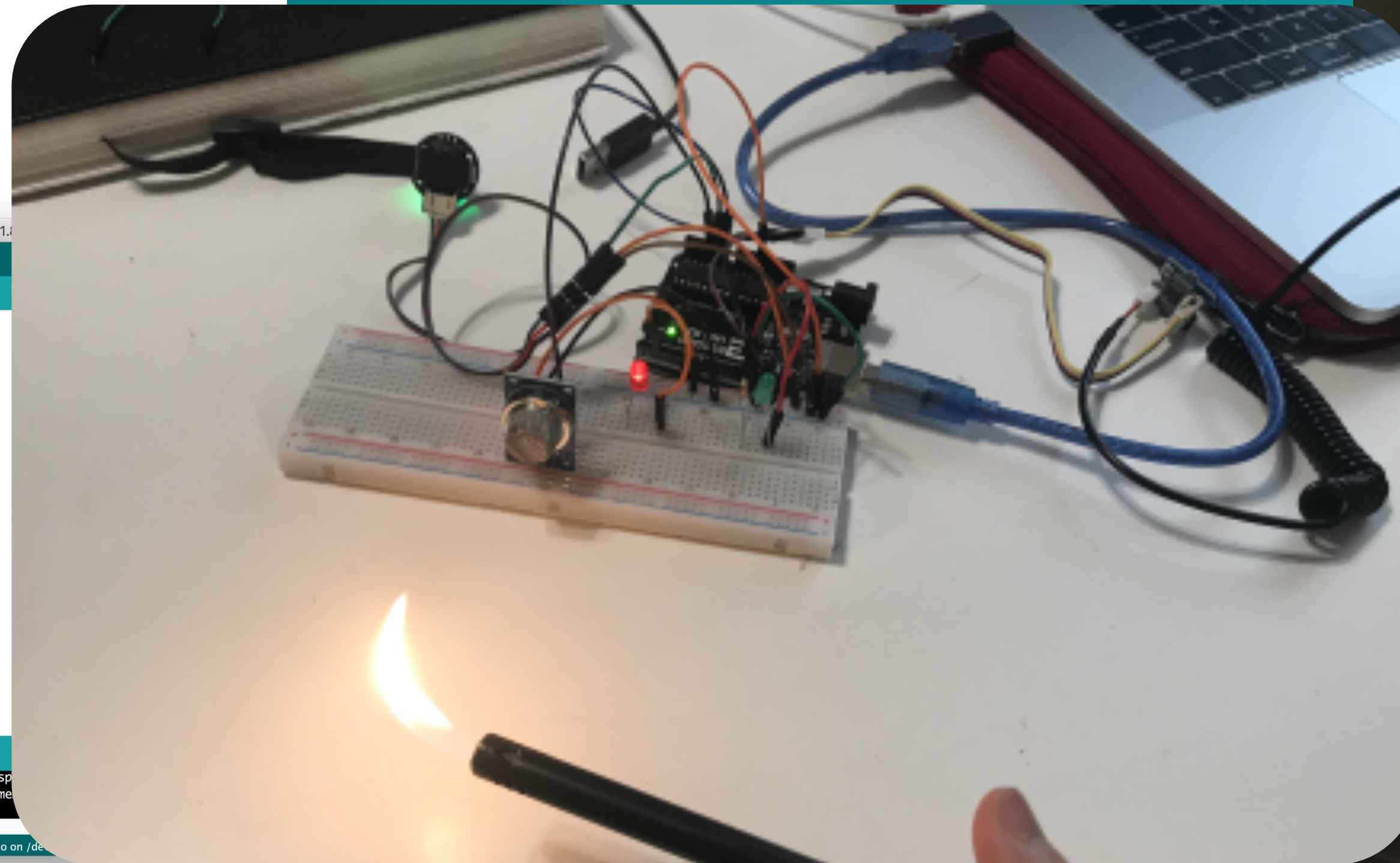


2 The LED light was on when there was a fire

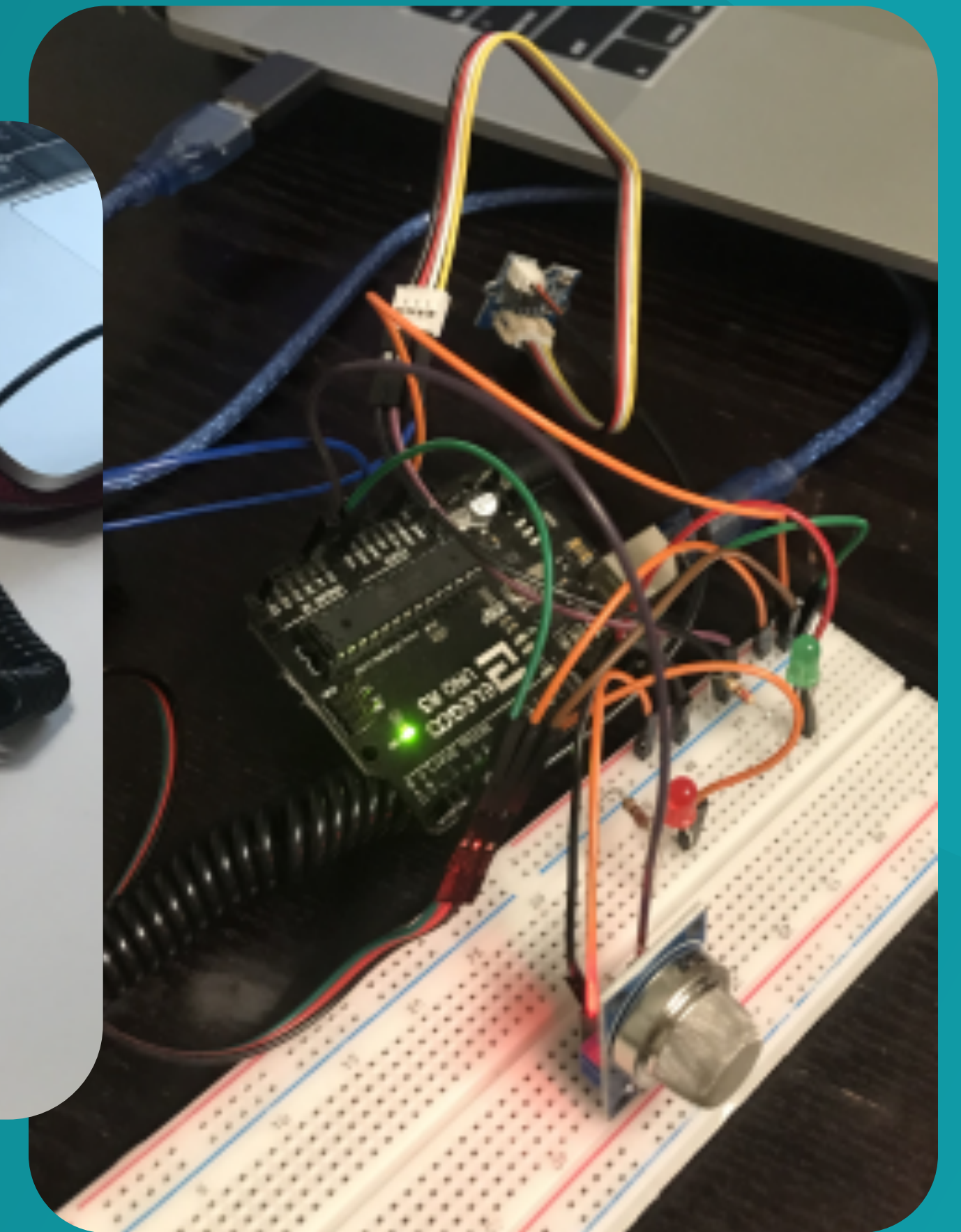


3 The LED light was still on in a few seconds after the fire was off

Smoke Sensor | 2nd Experiment

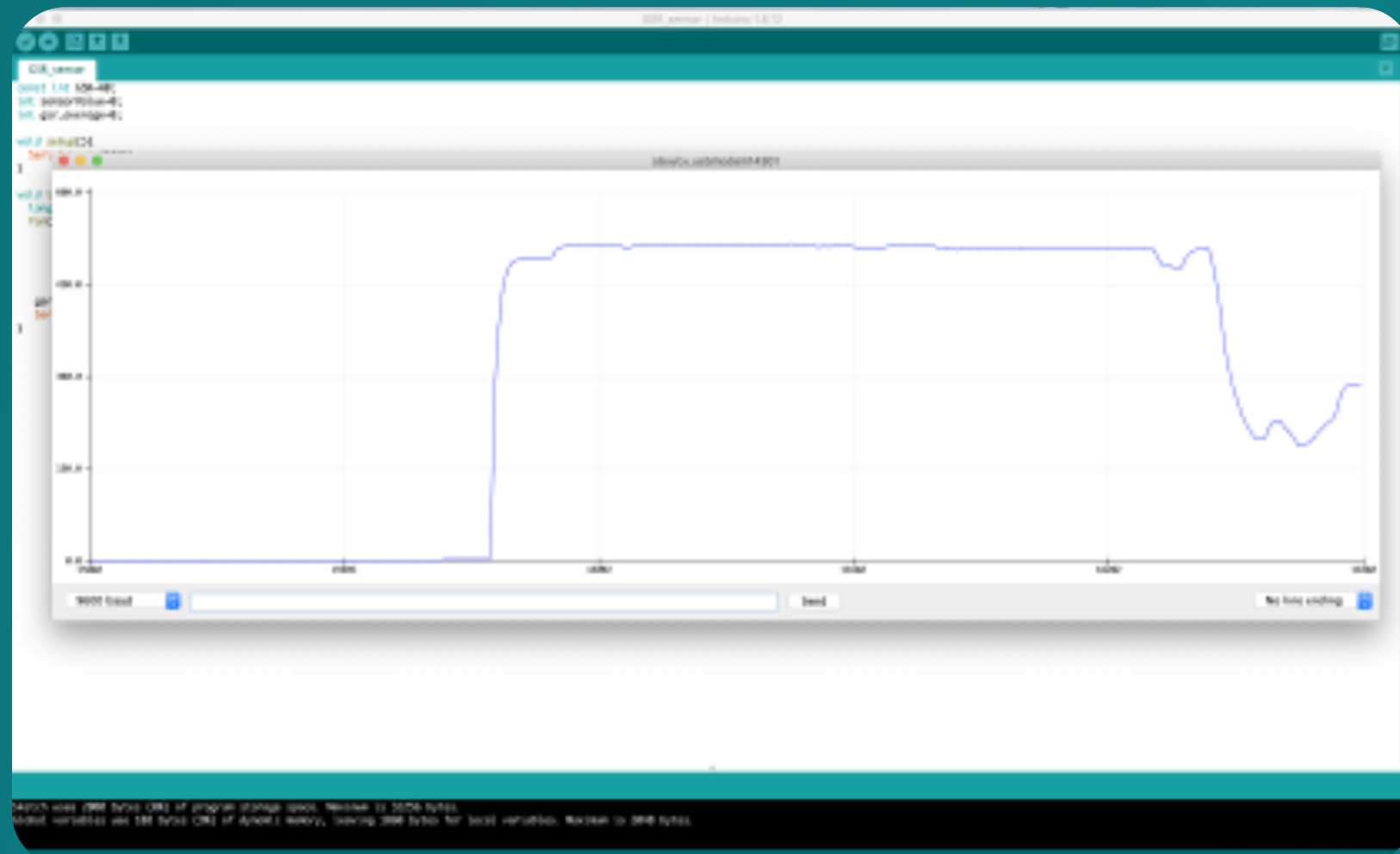


1 Experimenting different distances

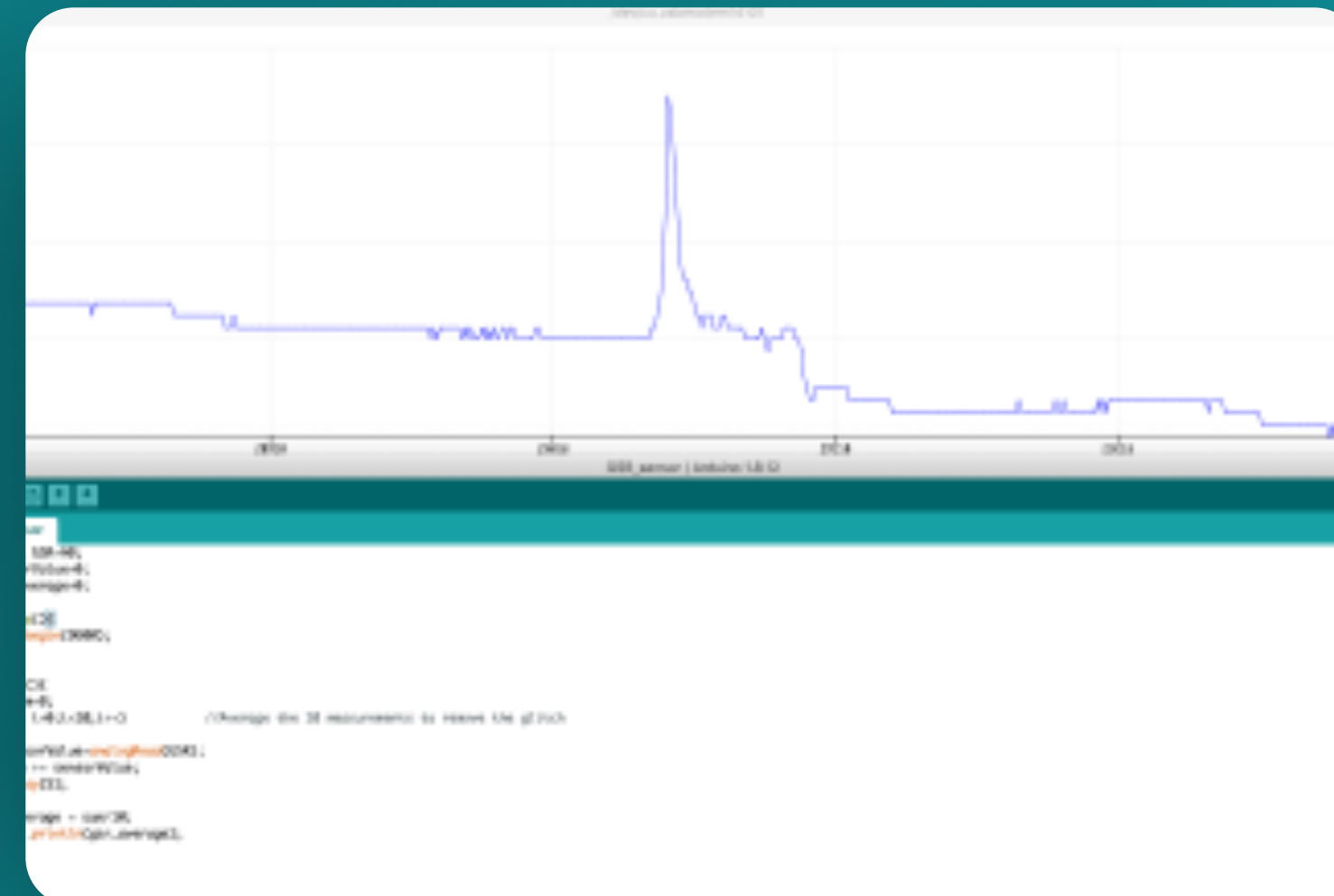


2 The LED light turned off when it was moved to another room

Galvanic Skin Response (GSR) Sensor | 1st Experiment



1 It started with a steady form when putting it on the user's fingers



3 When the user gave a fake laugh, the figure reached a peak, then dropped instantly

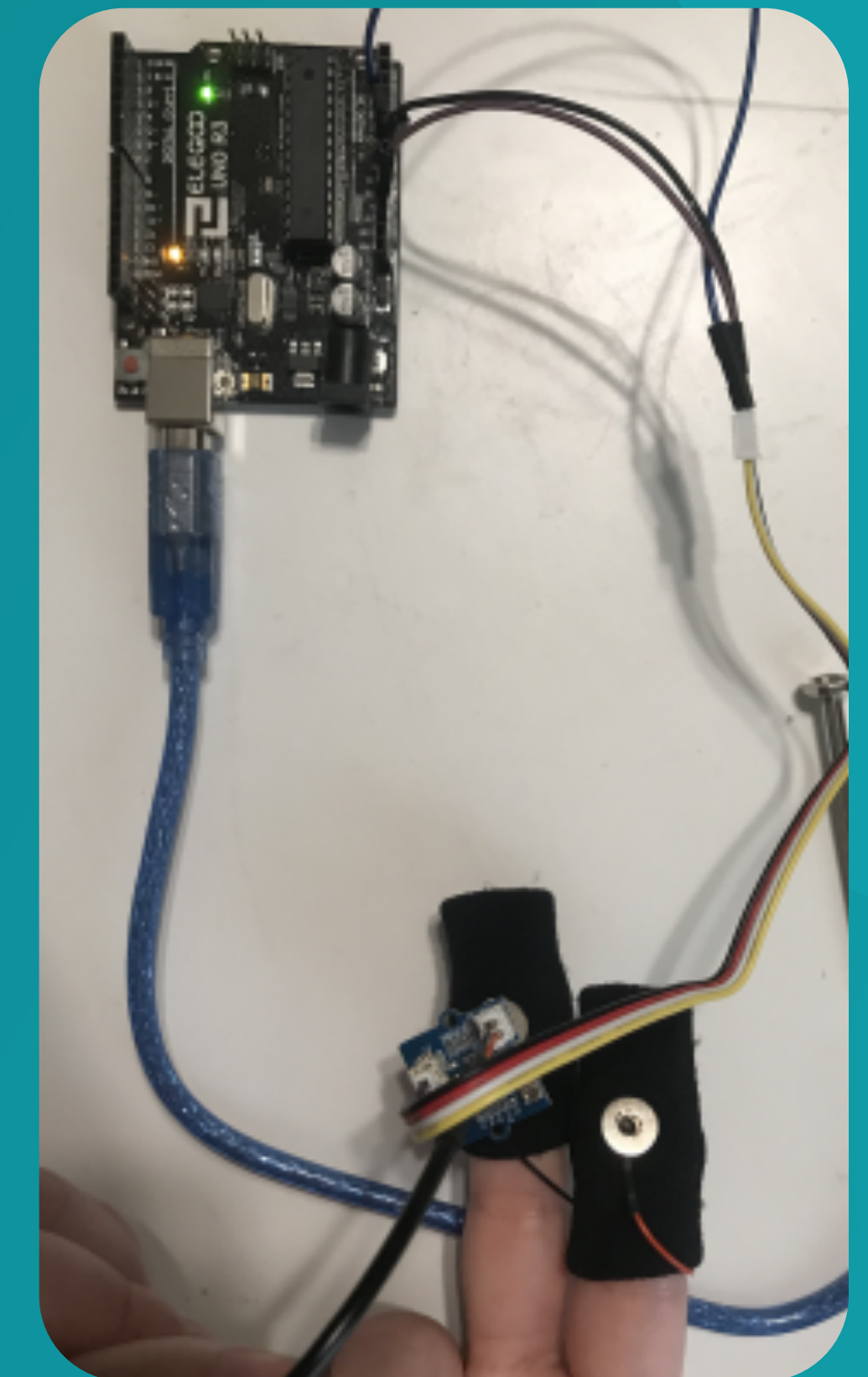


2 The figure varied greatly when the user keeps standing up and sitting down

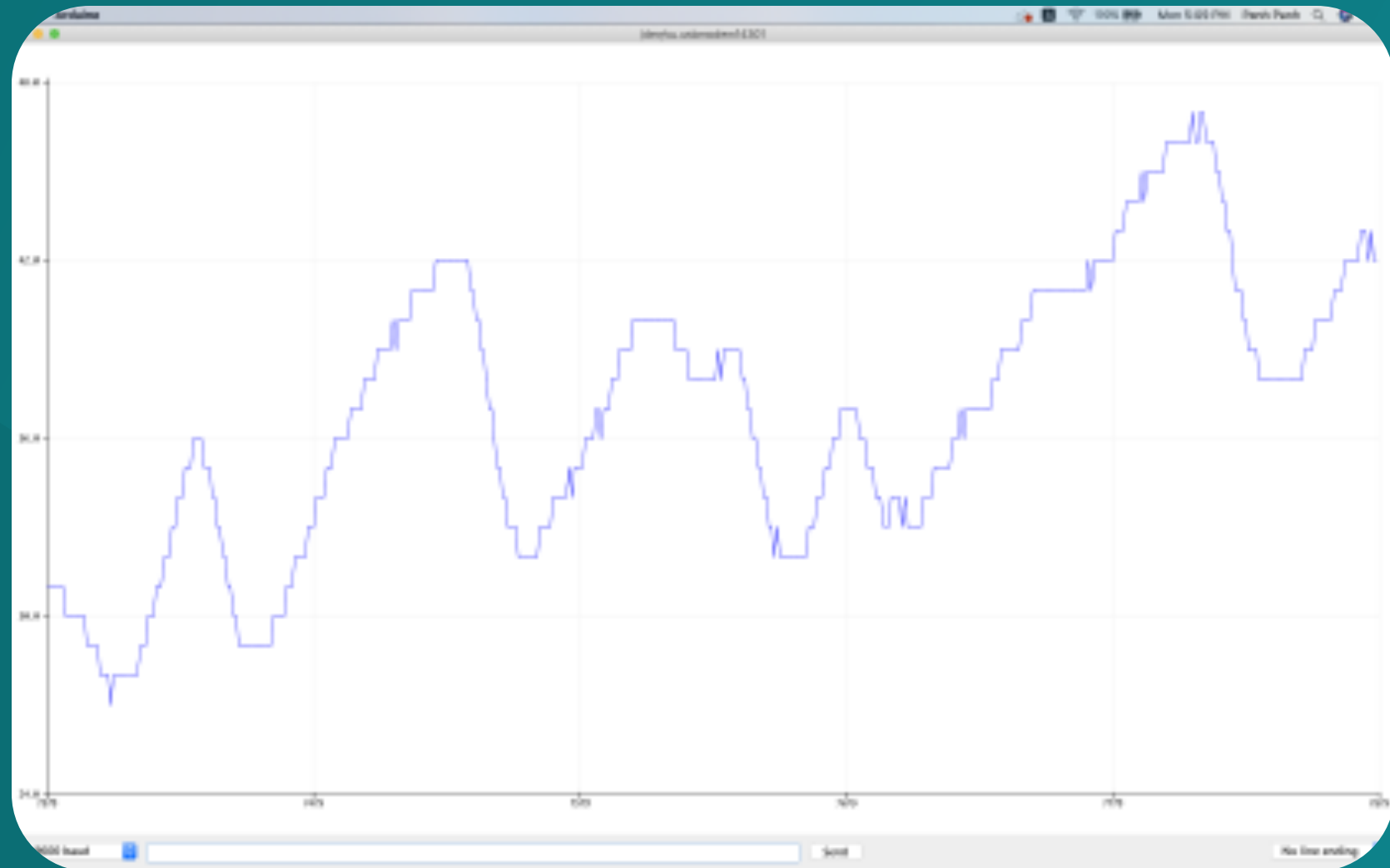
```
CSR_sensor
const int GSR=A0;
int sensorValue=0;
int gsr_average=0;

void setup() {
  Serial.begin(9600);
}

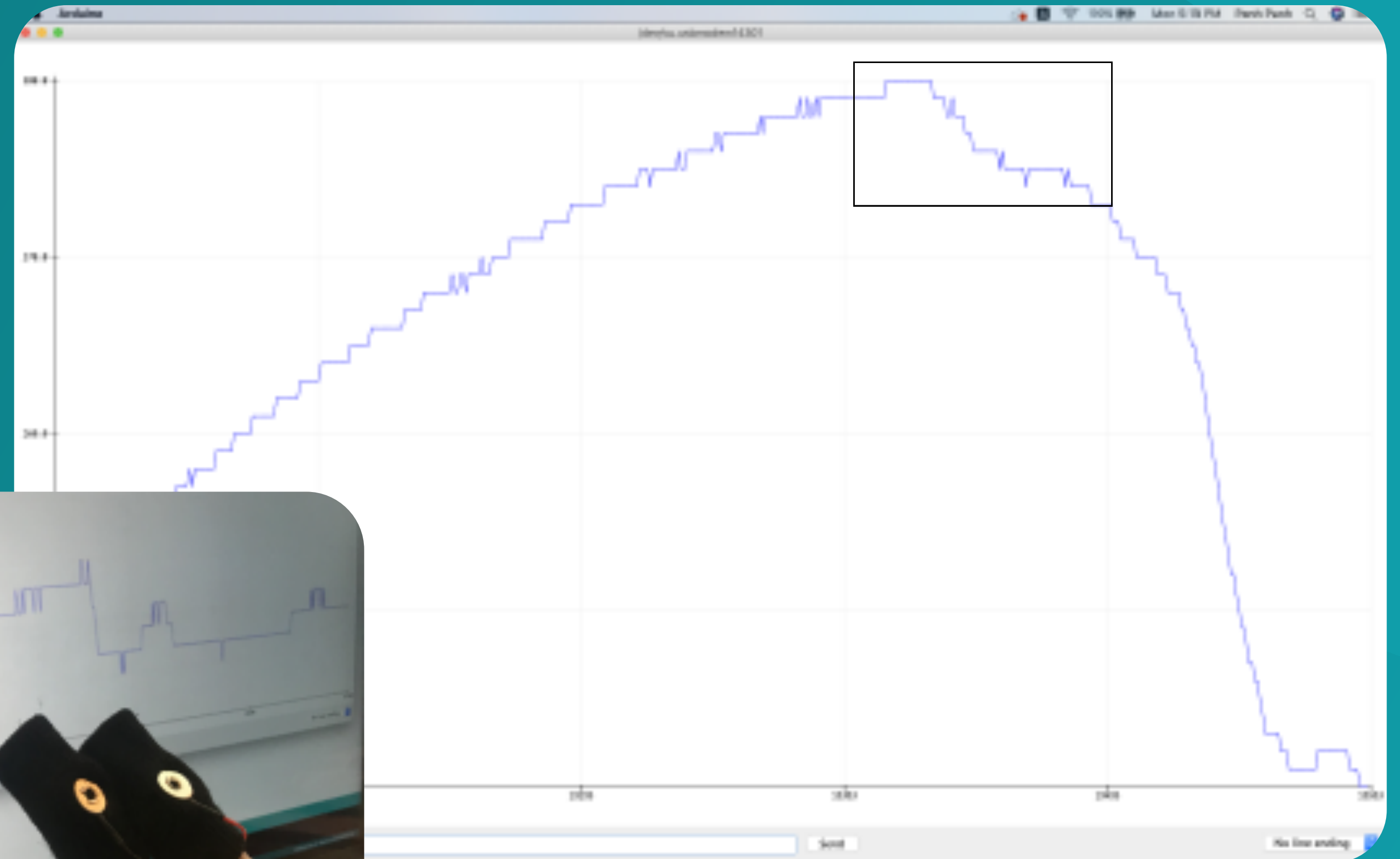
void loop() {
  long sum=0;
  for(int i=0;i<10;i++) //Average the 10 measurements to remove the glitch
  {
    sensorValue=analogRead(GSR);
    sum += sensorValue;
    delay(5);
  }
  gsr_average = sum/10;
  Serial.println(gsr_average);
}
```



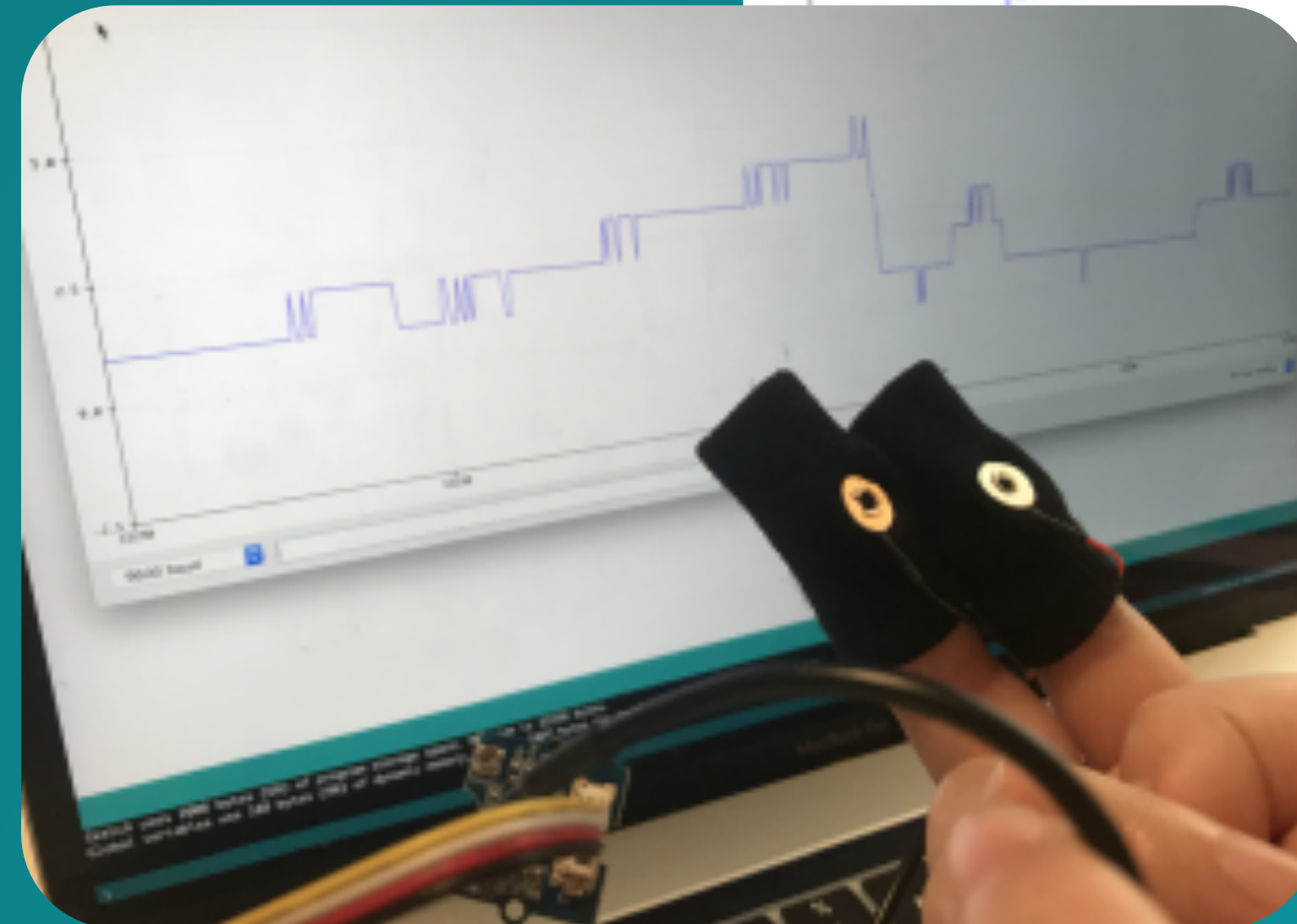
Mood Sensor | 2nd Experiment



1 When watching a short comedy, the sensor detected an unstable change of mood on the user



2 The figure was gradually increasing when listening to a favourite song, but it witnessed a decline when having an interruptive advertisement



User Testing Methods



User Testing Methods

Quasi Empirical

Used a 1 to 5 system usability scale, and calculated the average score from a post testing questionnaire.

Post Test Survey

Participants completed a 7 question survey about both the app and avatar.

Post Test Application Survey

To gain specific insights on what to improve on, we followed up with a survey for our evaluators right after they finished testing.

What was your overall impression of the application?

What was the best and worst thing about the application?

How would you change the application?

How would you compare the application to other quitting mechanisms you've used?

Post Test Avatar Survey

To gain specific insights on what to improve on, we followed up with a survey for our evaluators right after they finished testing.

Do you feel that your avatar can empathize with you?

How would you describe Gorby's personality? What kind of personality type would you like Gorby to have?

What colors/age do you associate with Gorby?

Participations

13

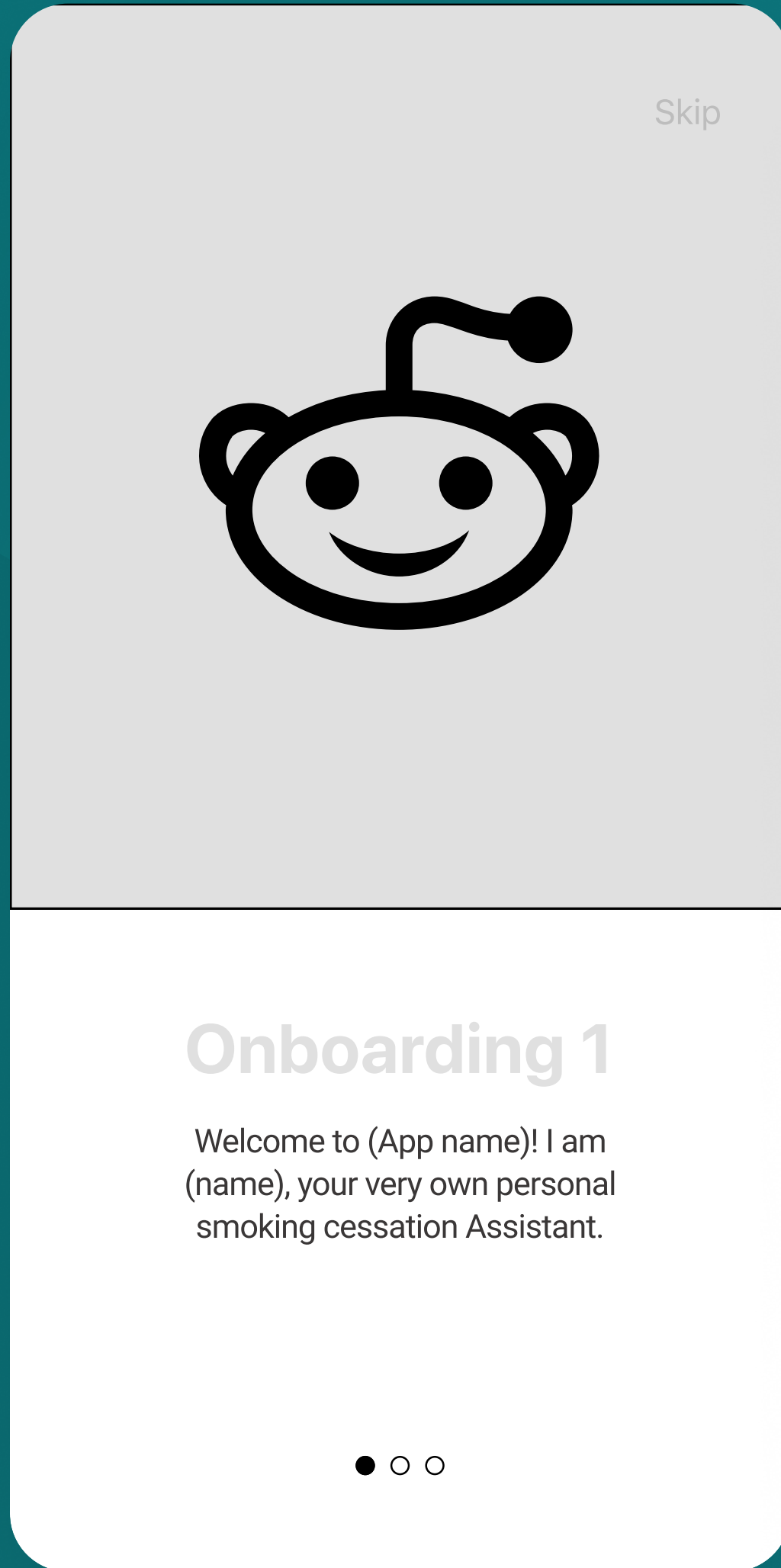
Mid-fi

10

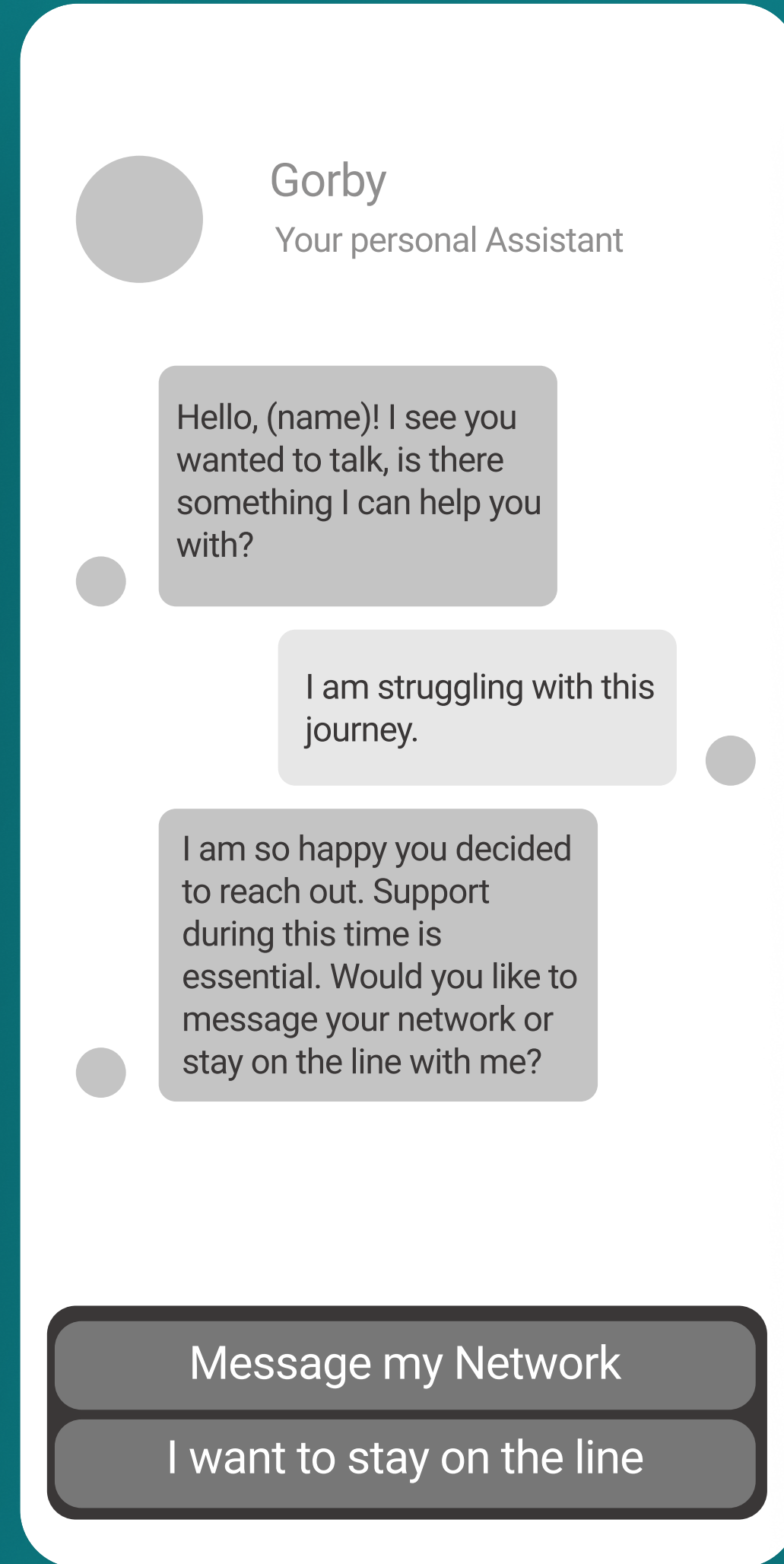
Hi-fi

Low-Fi Prototype

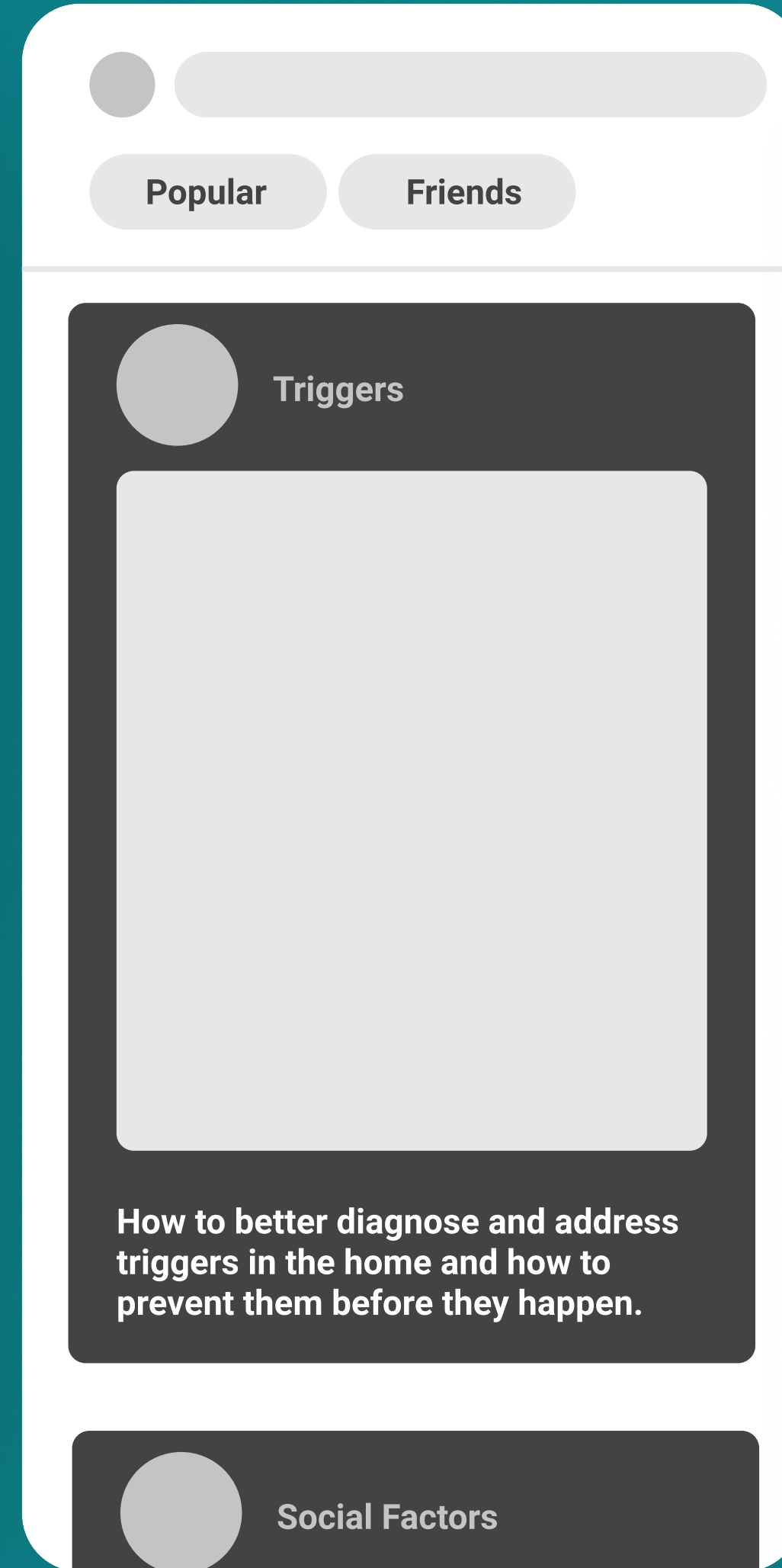




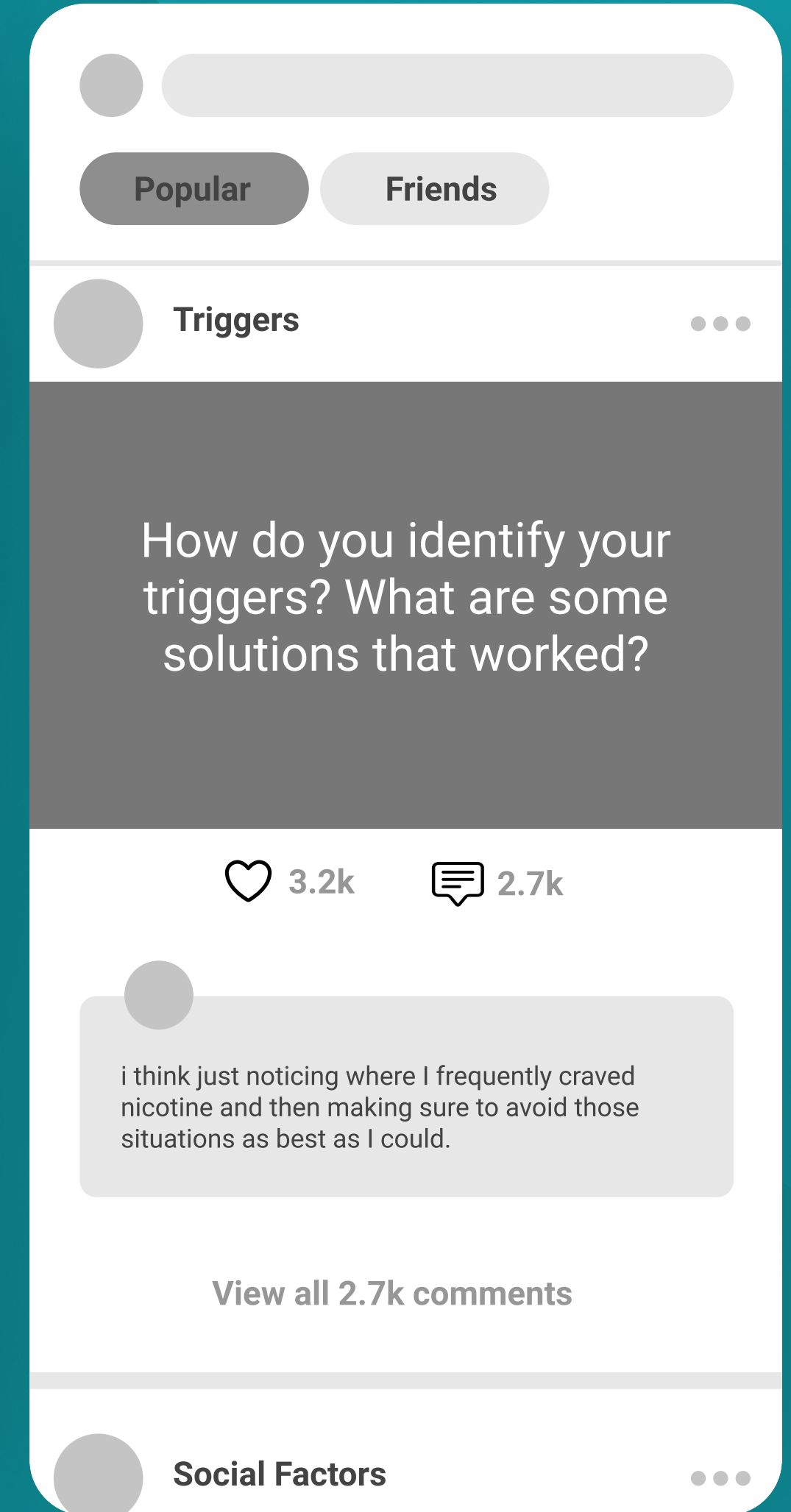
Onboarding Page



Chat with Gorby



Home Page



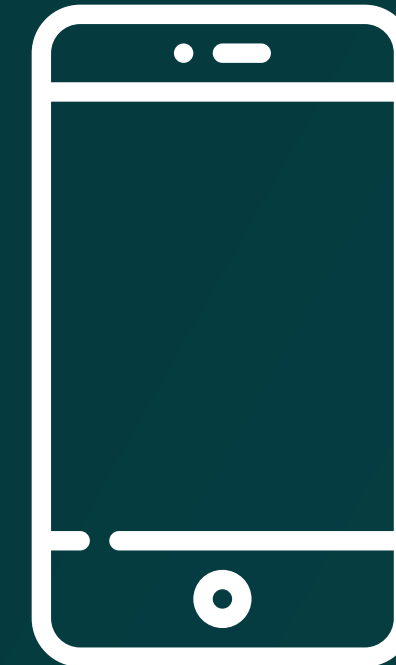
Thread and Chat

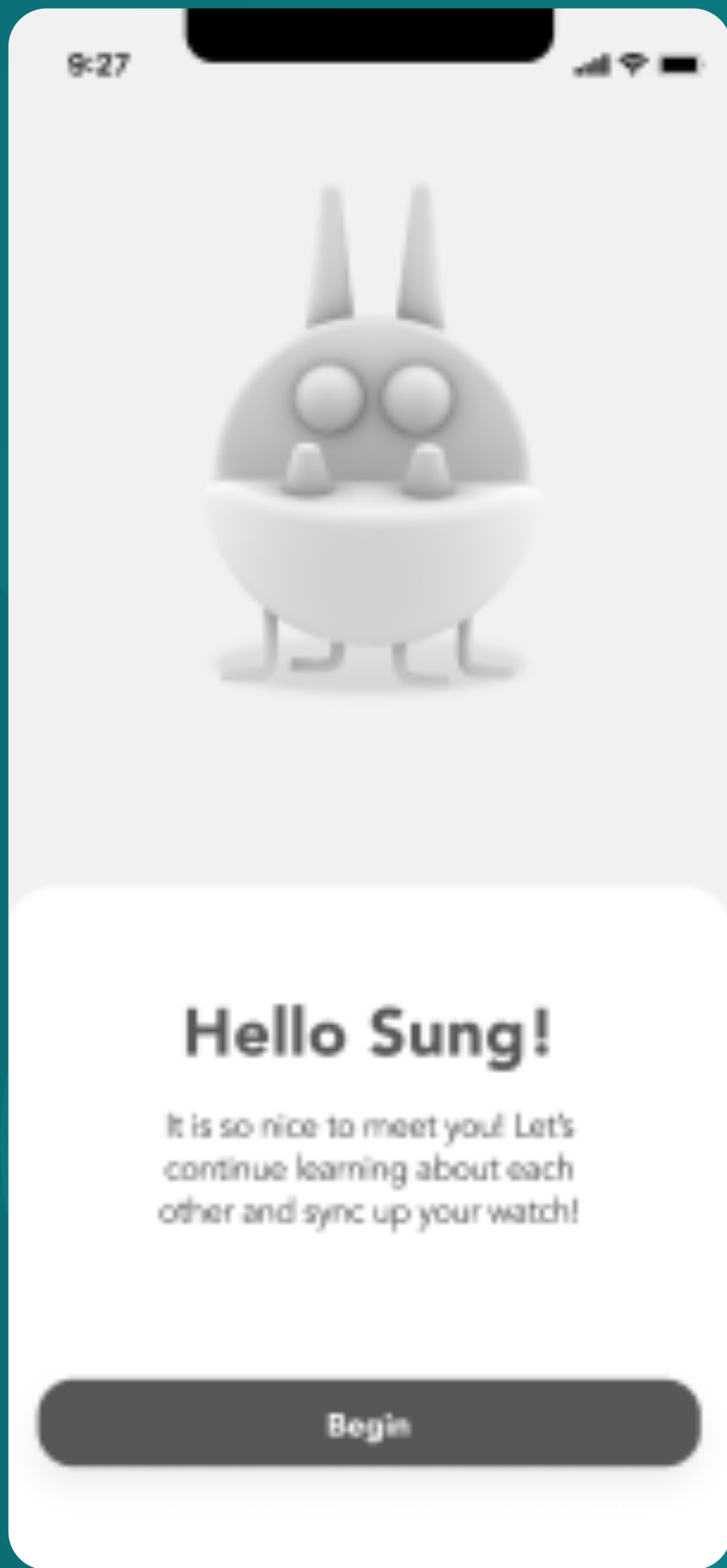
Lo-Fi Changes

- Onboarding process has been streamlined and language reflects brand and Gorby Personality
- Log insights has changed from the home page
- The insights have become less chart dependent and are able to be accessed without the aid of Gorby
- The Community page has changed and become more concise

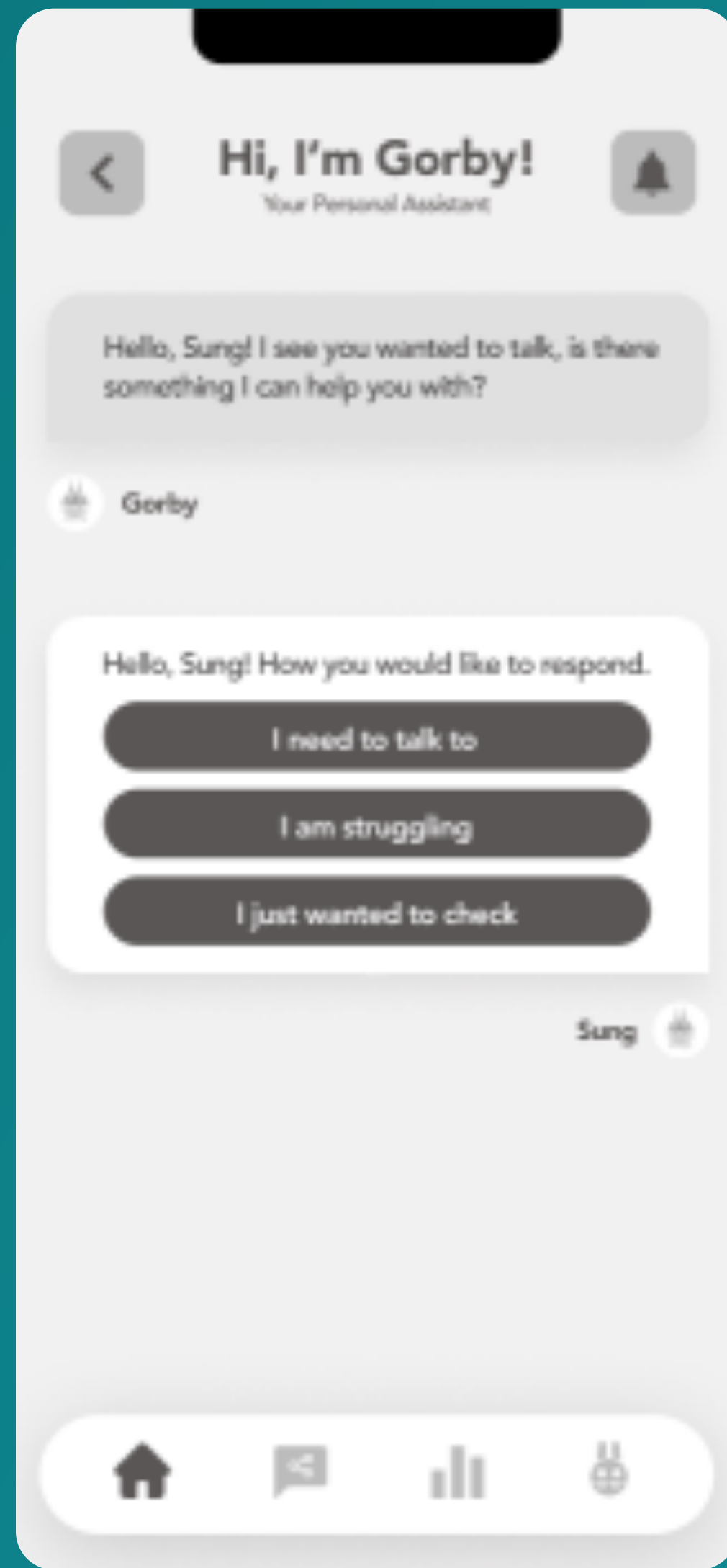
Mid-Fi Prototype

User Testers: 13

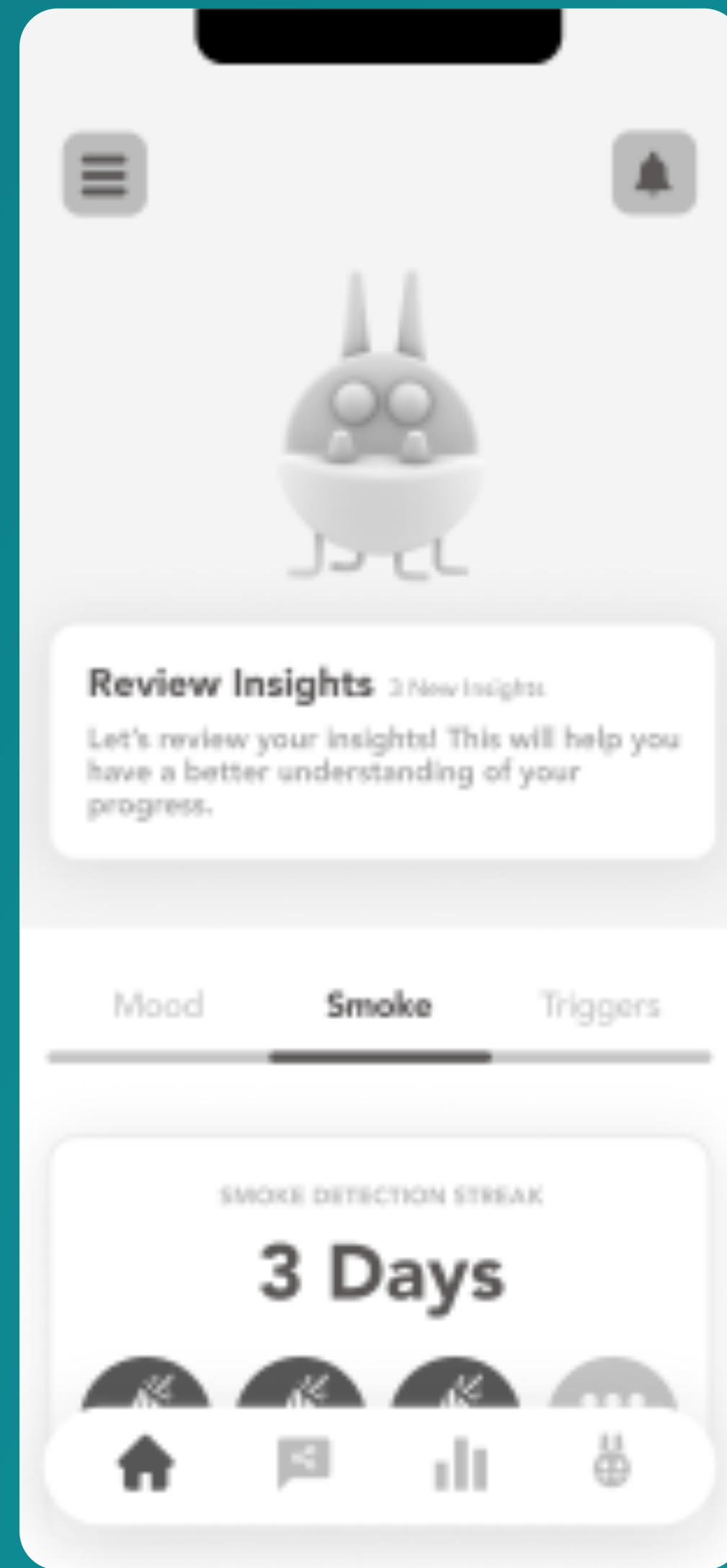




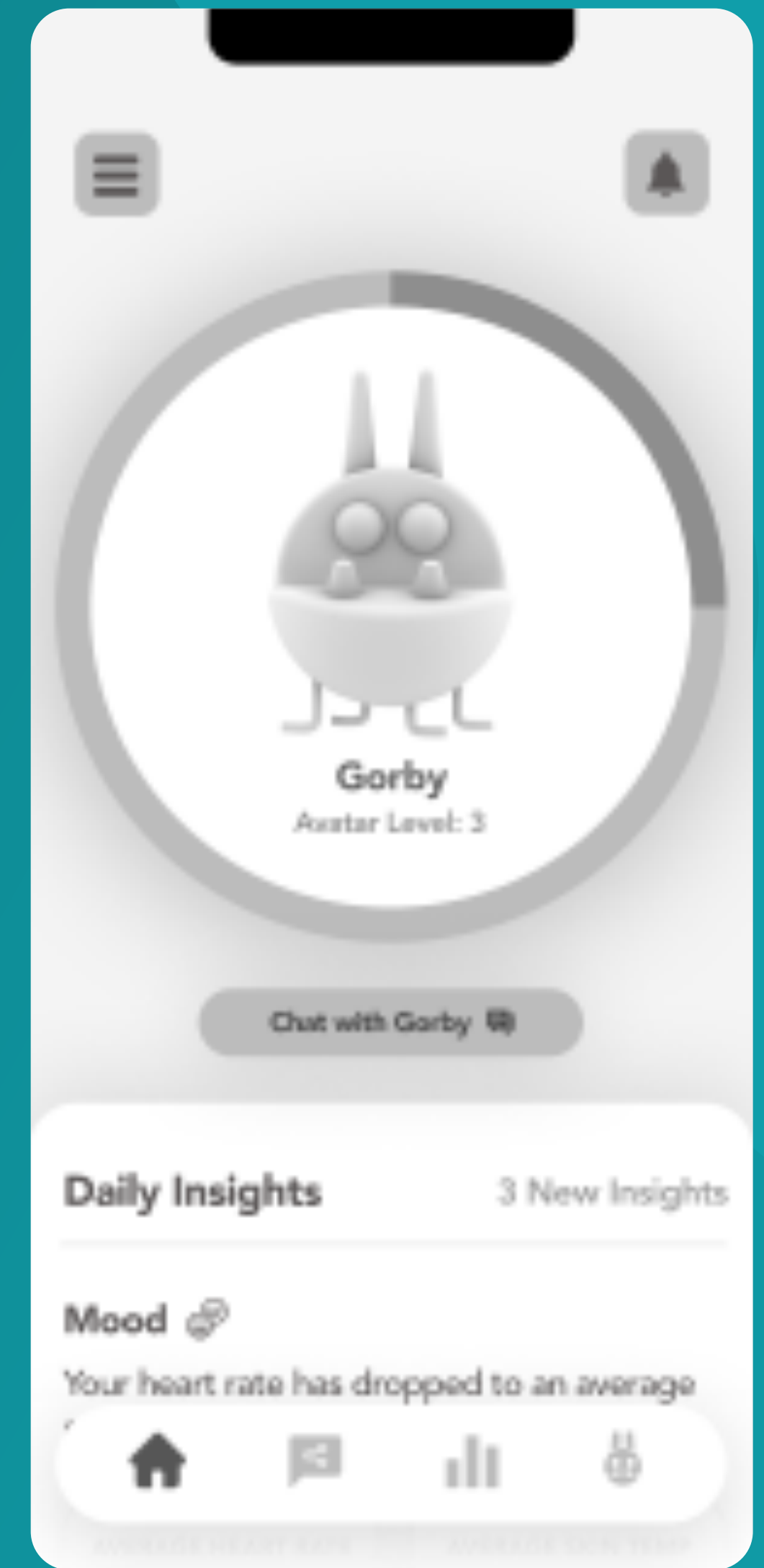
Onboarding Page



Chat with Gorby



Home Page

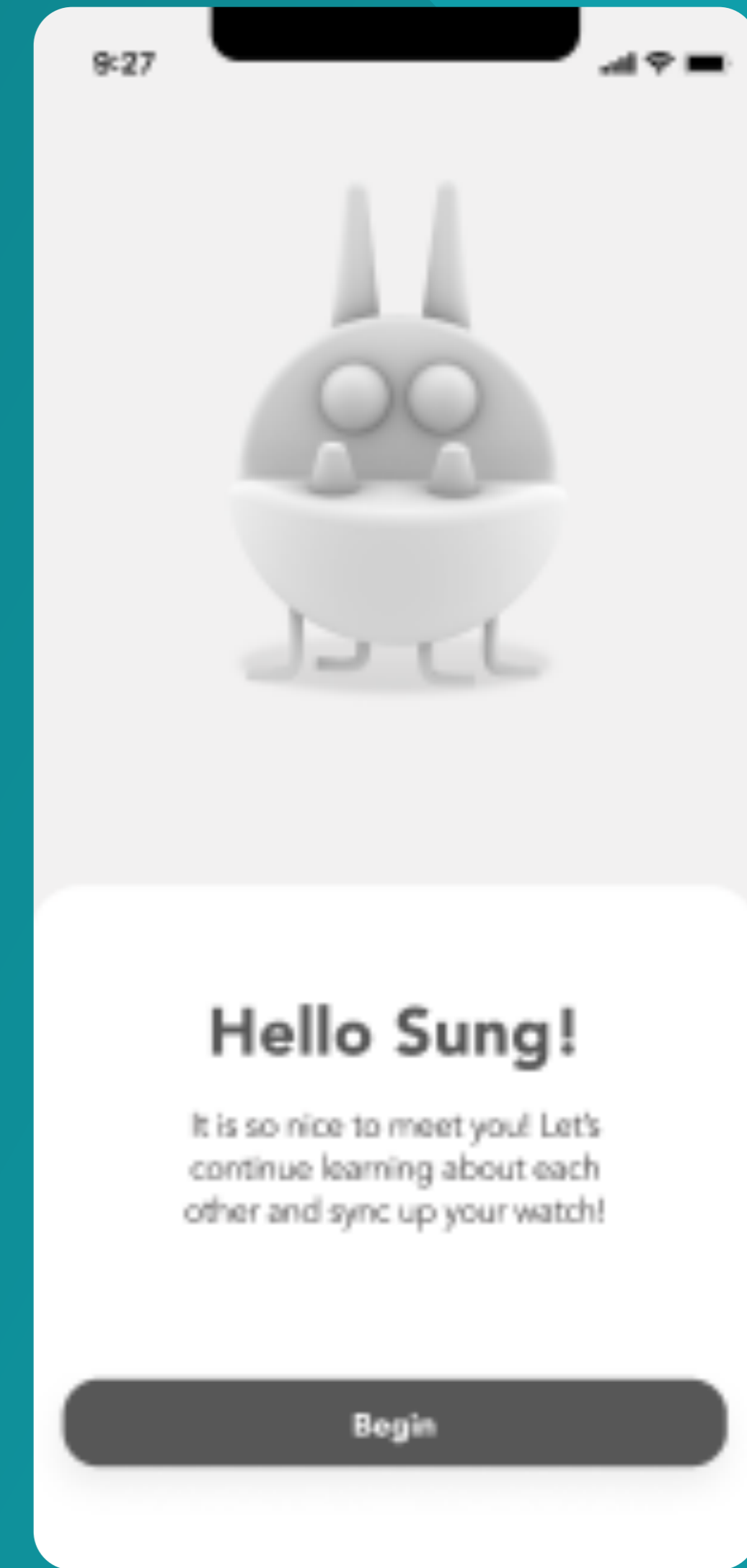


Insights

Onboarding

user feedback

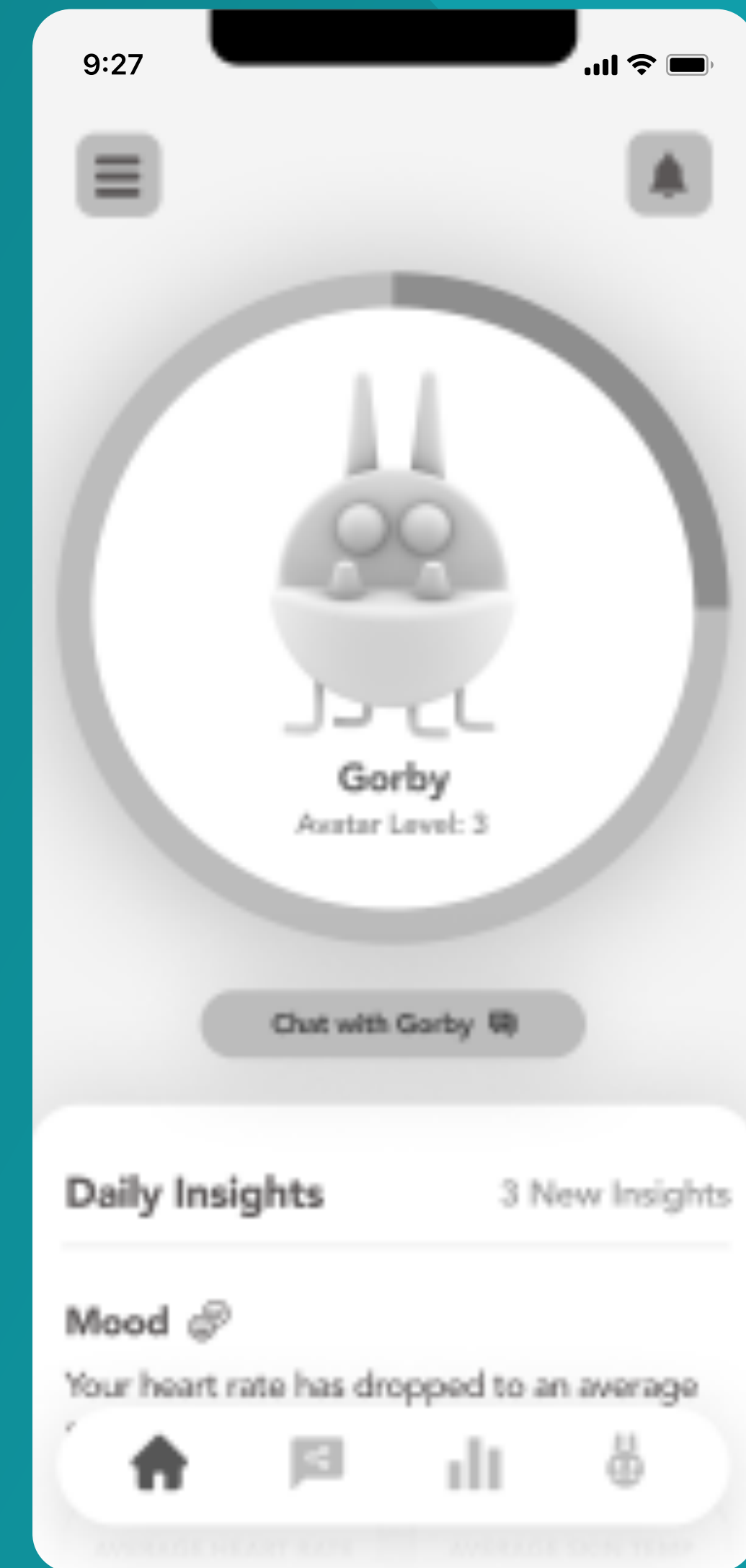
- "Give more introductions about gorby like a background or story"
- "For the on boarding I would like one more page for the wearable device"
- "It would be nice if there is a short catchphrase to briefly describe the app."



Home Page

user feedback

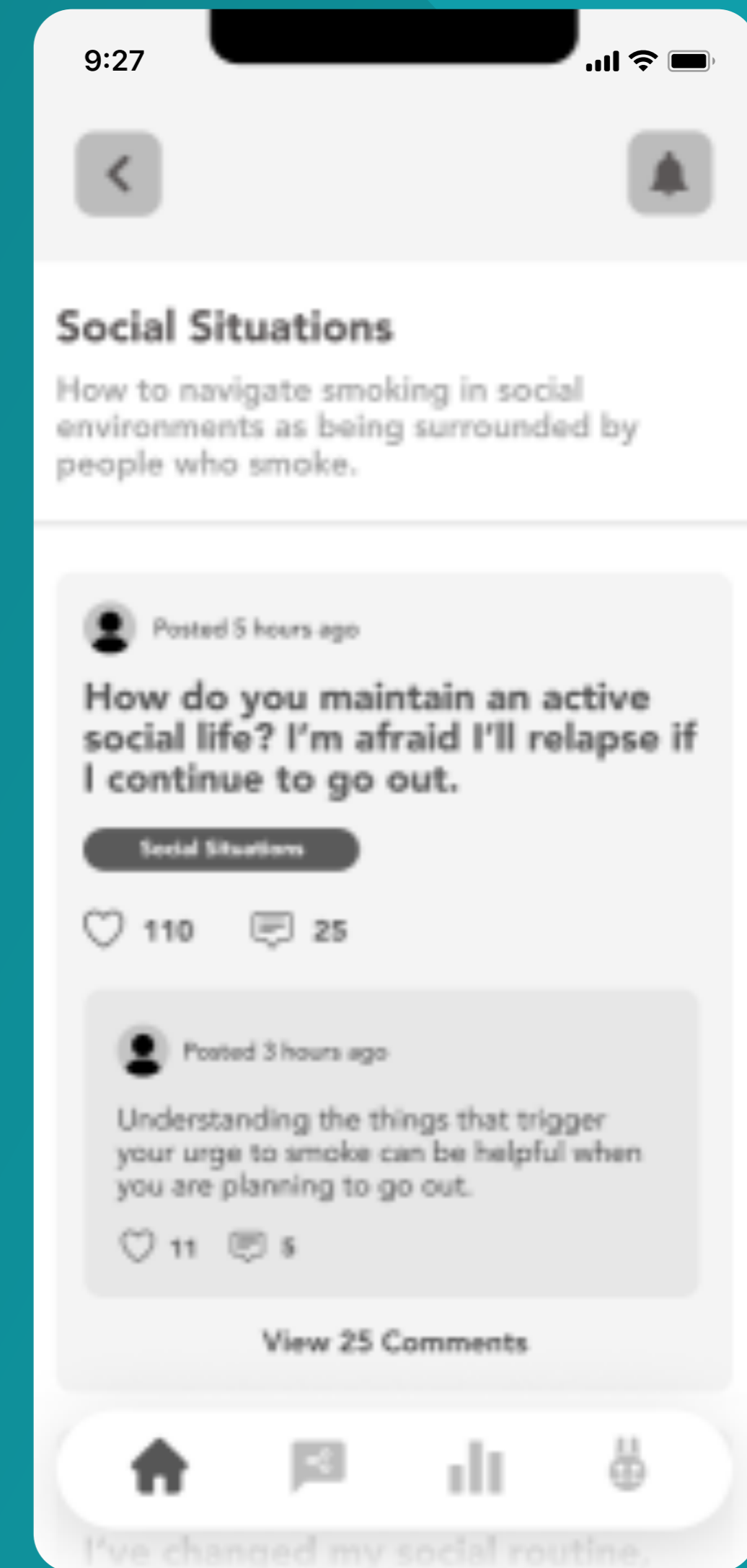
- “I feel like I want more explanation for the insights”
- “Visually I would like a little more space for the daily insights”
- “I think you could resize the circle completion bar to make it smaller.”



Community

user feedback

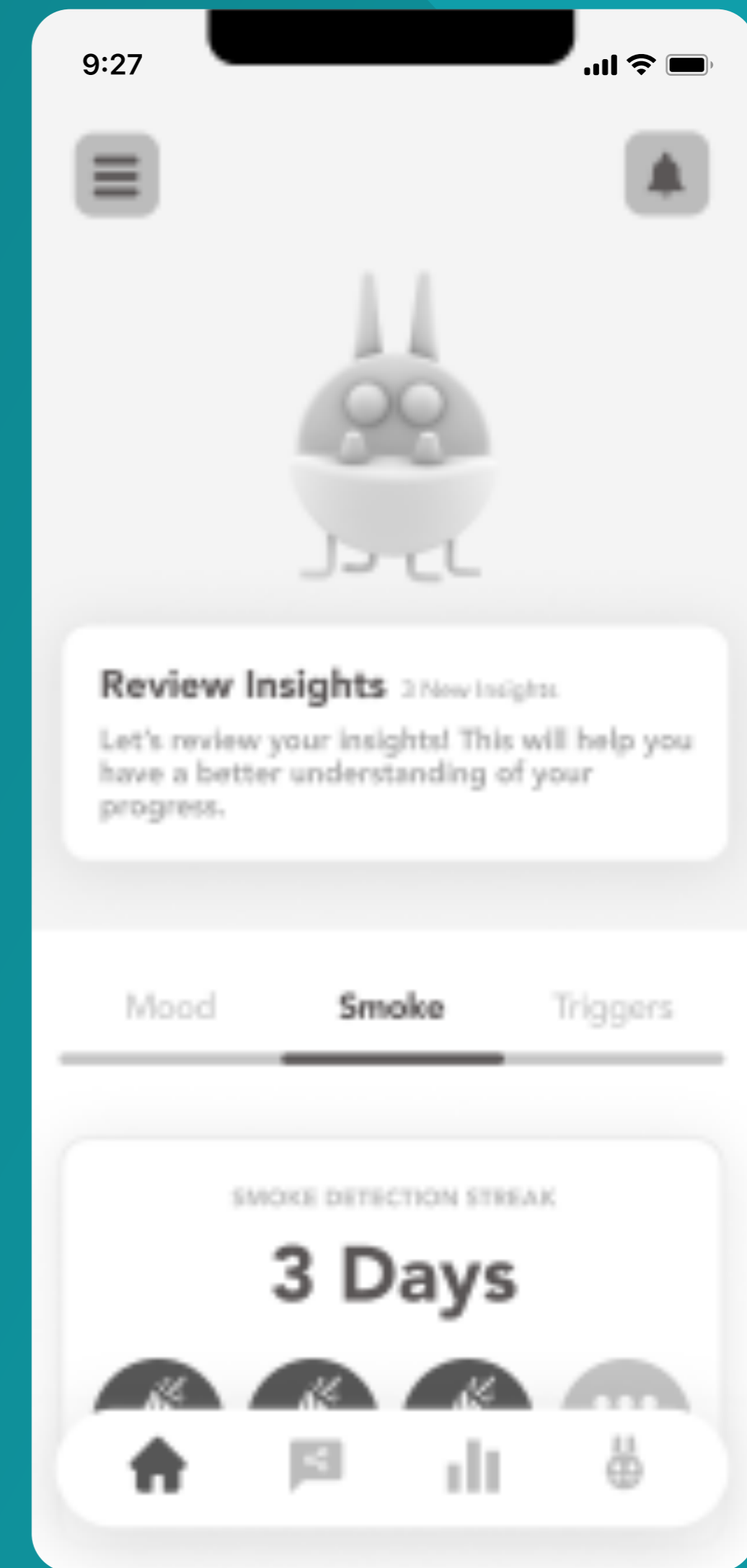
- “I think if you could add a feature where we could add anonymous users in the forum as friends”
- “I would want to be able to make friends with anonymous users”
- “Show the level of anonymous user’s Gorby and their achievements”



Insights

user feedback

- “For mood tab highlight your average heart rate and skin temp at the top of the screen instead of having to scroll down and look at the two graphs”
- “The wording add smoking session is weird”
- “I thought having the three tabs that you had to scroll down to was weird versus having it be the full page”



Avatar

user feedback

- "Gorby seems like someone who tells me things I already know about the app"
- "I don't think there is a way for me to emotionally connect with it, I think it should be a Siri like AI instead"
- "I think being able to really customize gorby and see his emotions and animations would help me enjoy the app"



User Questions

To gain specific insights on what to improve on, we followed up with a survey for our evaluators right after they finished testing.

- **Overall impression**
- **Best and worst parts**
- **Any changes**
- **Can the avatar provide empathy**

Mid-fi

User Testing Results

User Testing Questionnaire

1) It is easy to get familiar with the platform



2) The onboarding process with pairing your wearable felt effortless and practical



3) You felt in control of the interaction, it is logical and predictable



4) You were able to understand the navigation icons in the application



5) The platform made you excited and motivated to start your nicotine recovery



6) Your smoking data insights were clearly visualized and motivating



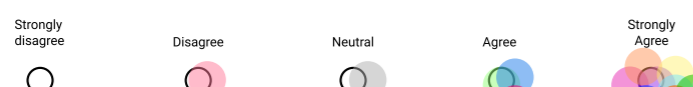
7) The forum page is beneficial and practical



8) You would feel comfortable reaching out to your avatar, the relationship feels useful



9) Messaging people from your network makes you feel supported and accoutable



10) You would use this application and recommend it to others



SUS Score

67.9

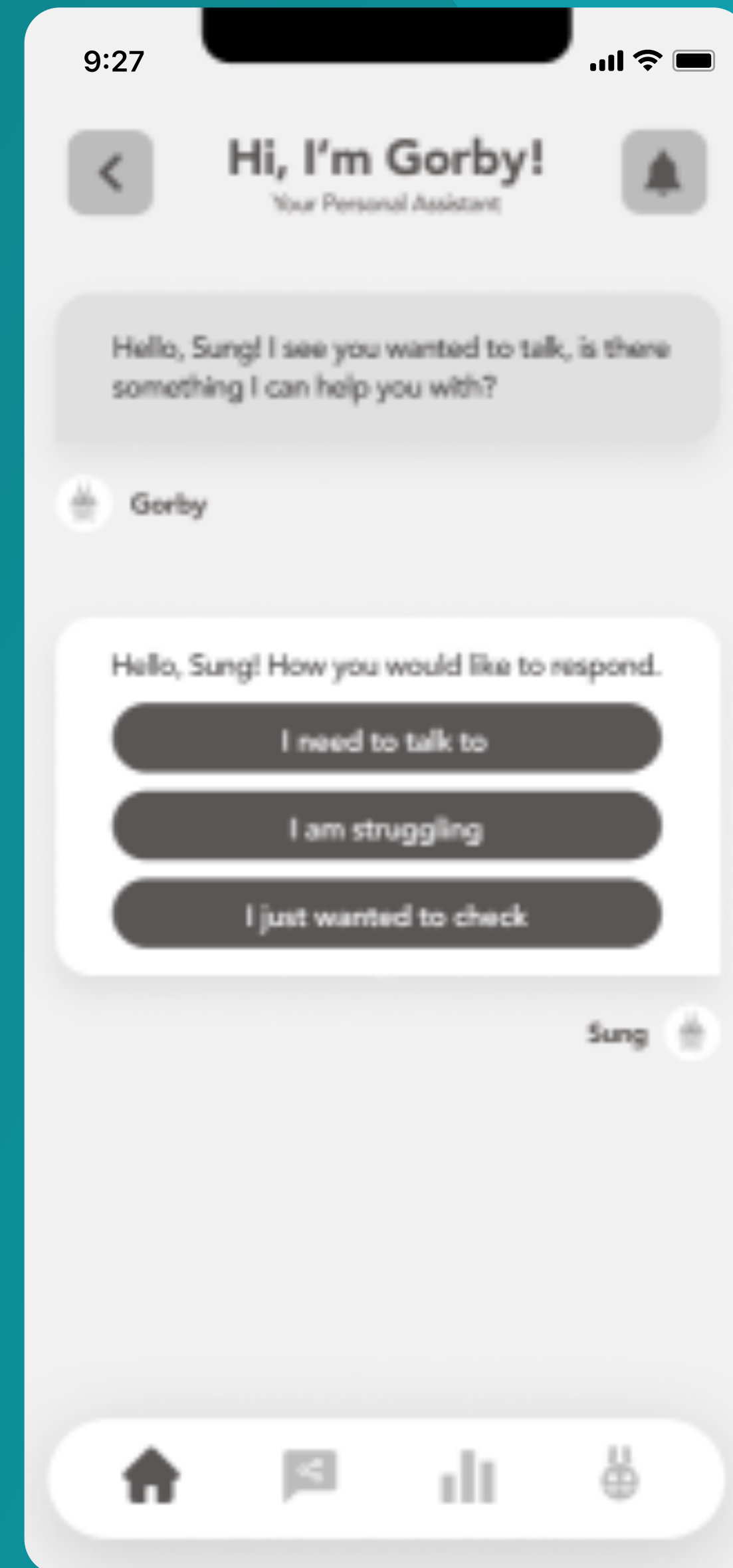
n = 13

Mid-Fi Changes



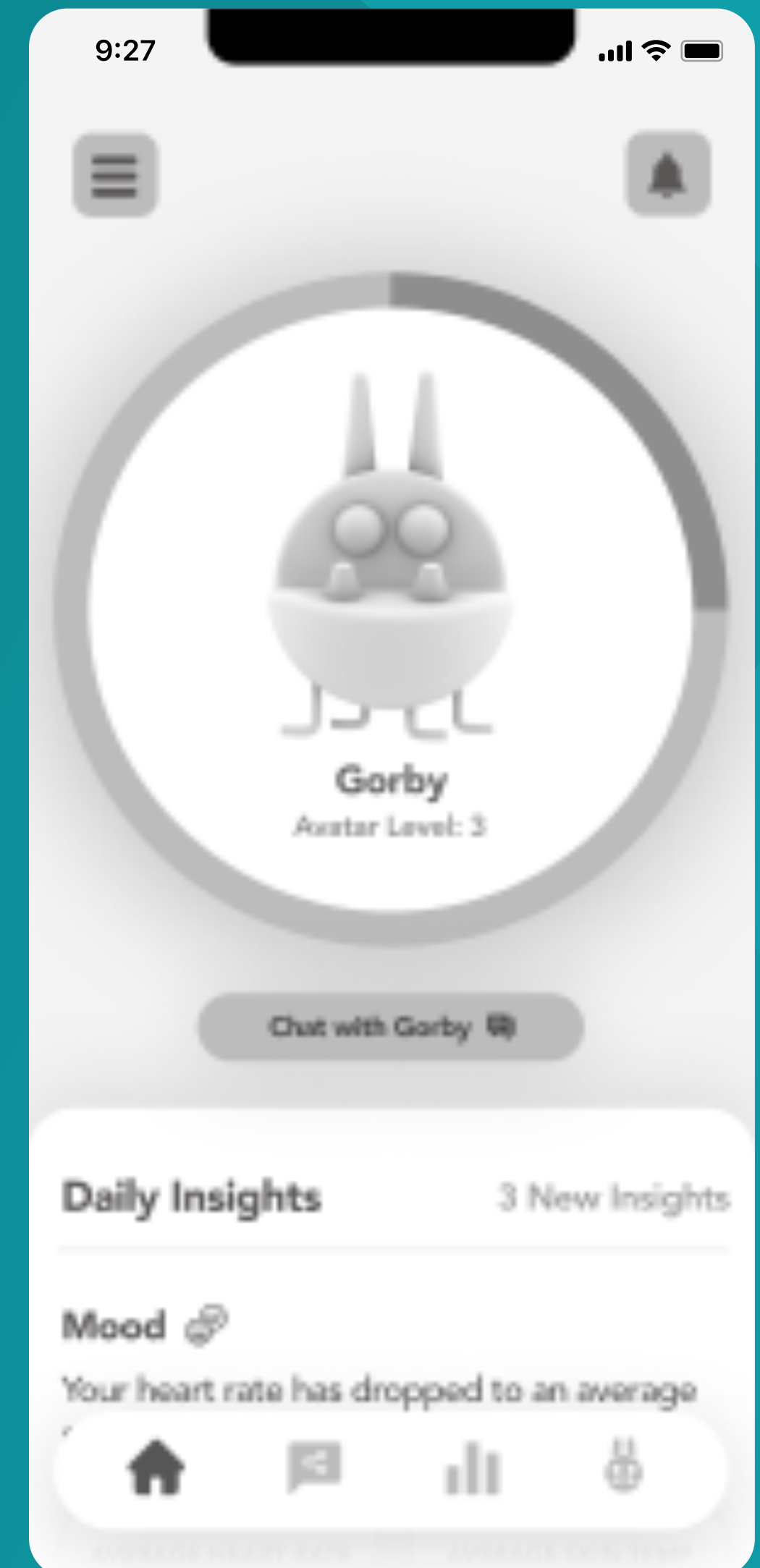
Using our testers feedback...

**We will remove the
feature to chat with
Gorby.**



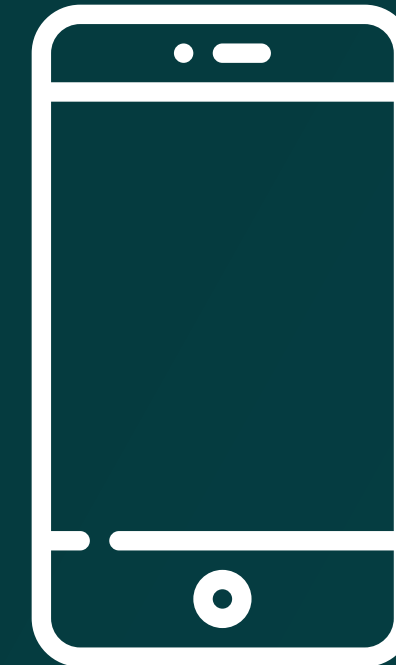
Overall

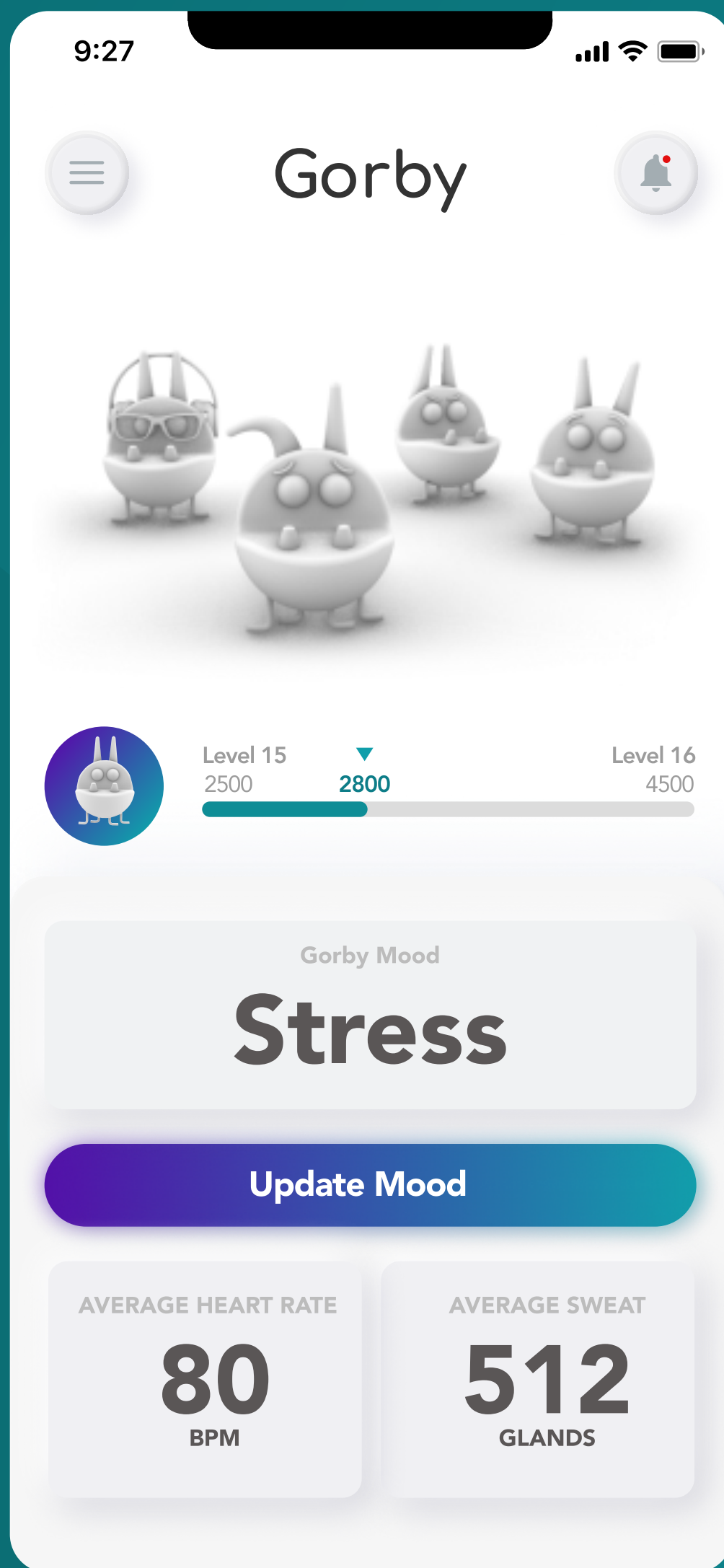
- "I feel like I want more explanation for the insights"
- "I would want to be able to make friends with anonymous users"
- "I thought for the insights having the three tabs that you had to scroll down to is weird versus having it be the full page"
- "I think being able to really customize gorby and see his emotions and animations would help me enjoy the app"



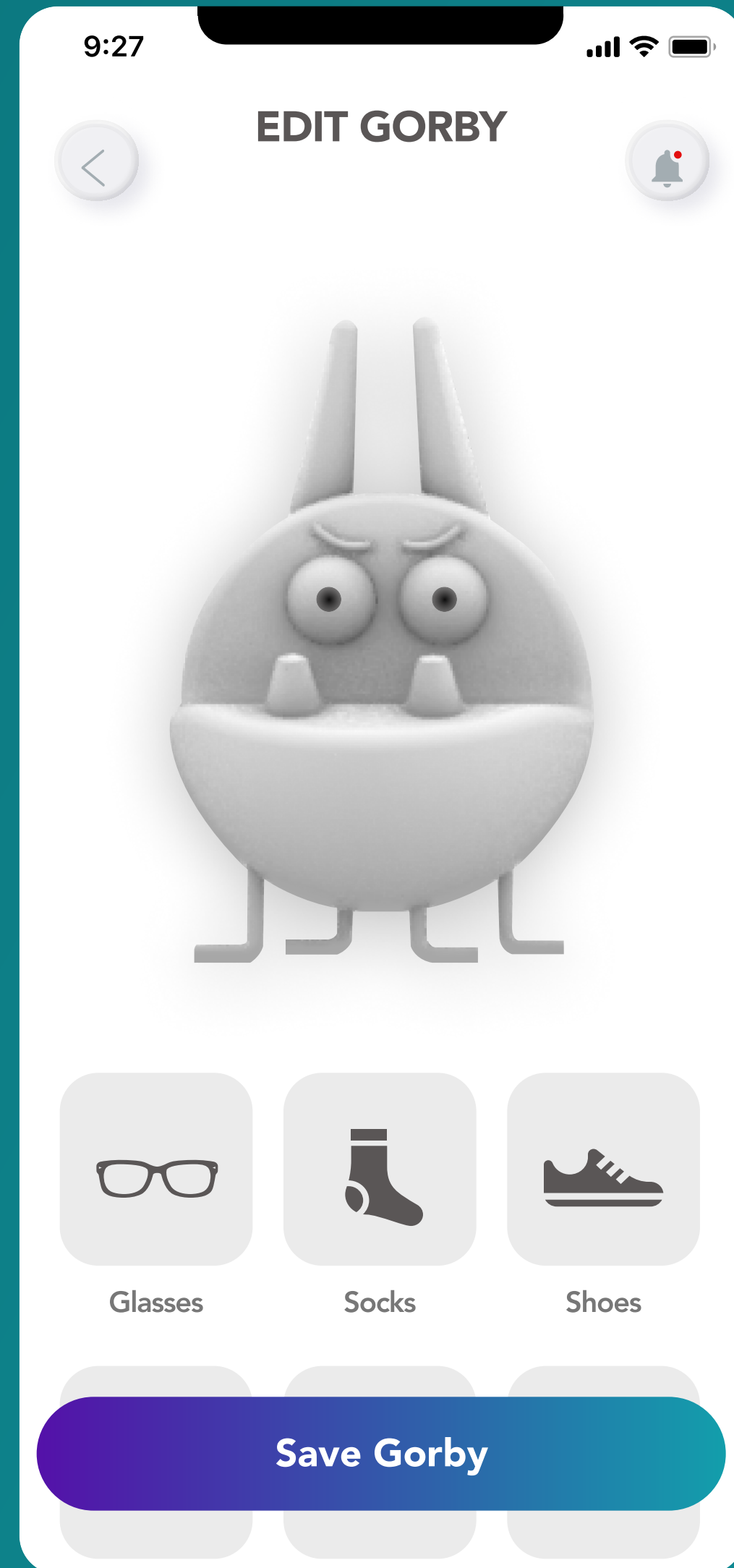
High-Fi Prototype

User Testers: **10**





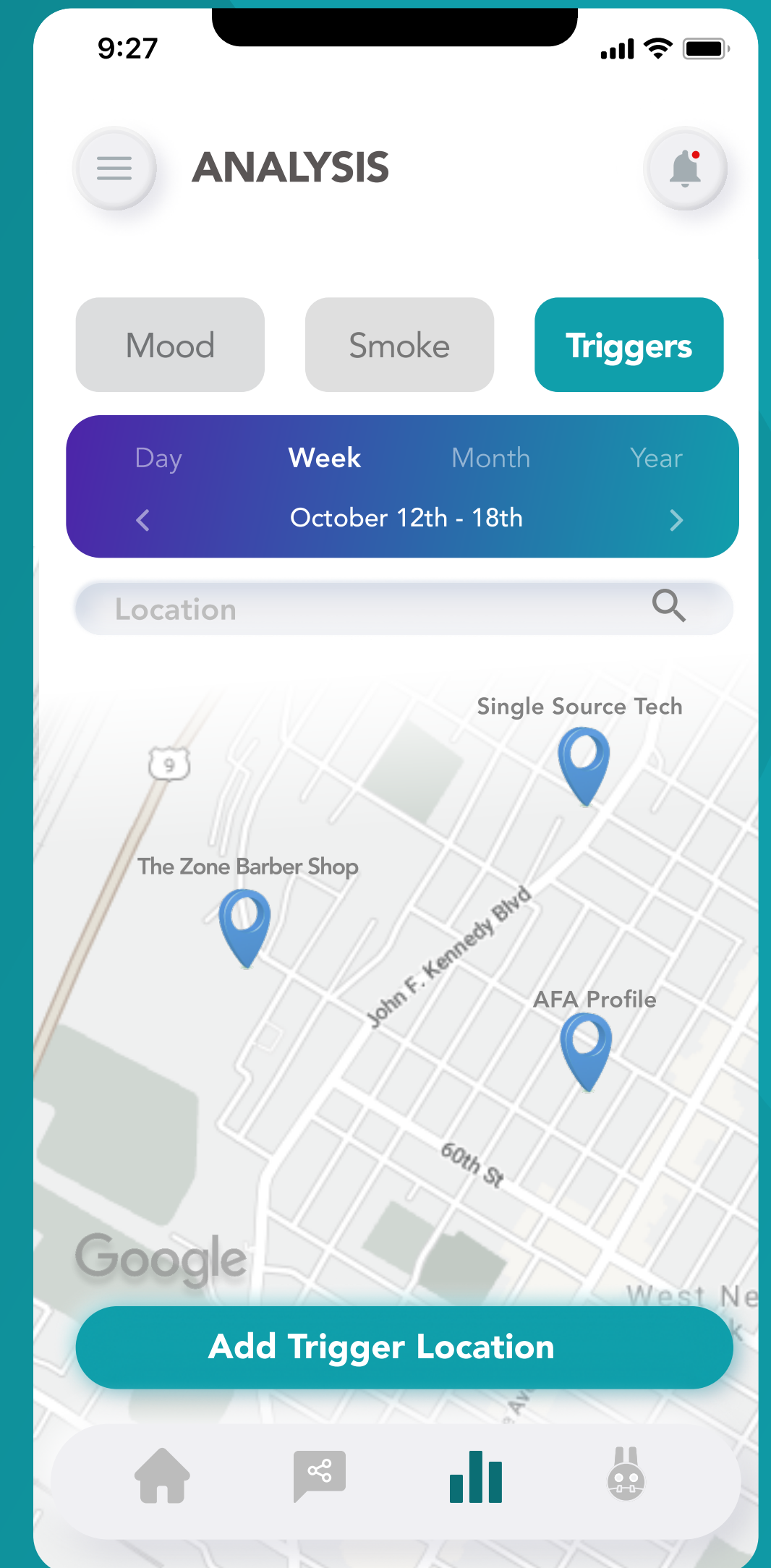
Home Page



Customizable Gorby



Data Tracking



Triggers Analysis

User Questions

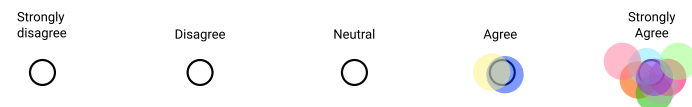
To gain specific insights on what to improve on, we followed up with a survey for our evaluators right after they finished testing.

- **Most improvements**
- **Parts need to be changed**
- **User relationship with Gorby**
- **Removing chat feature**

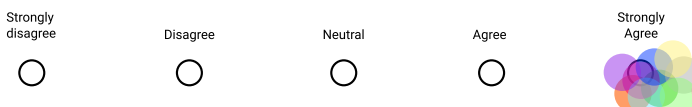
Hi-fi First Round User Testing Results

User Testing Questionnaire

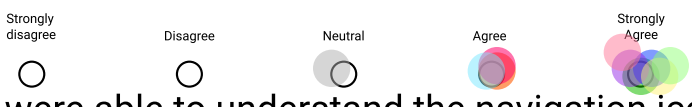
1) It is easy to get familiar with the platform



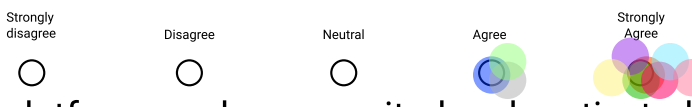
2) You felt the application paired with the wearable would support you in the suggested scenarios



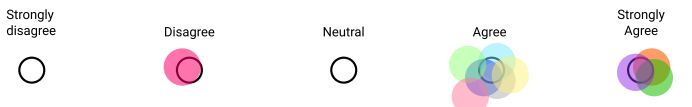
3) You felt in control of the interaction, it is logical and predictable



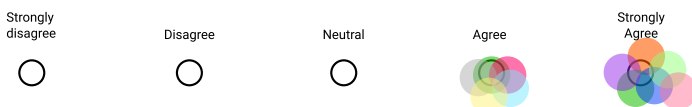
4) You were able to understand the navigation icons in the application



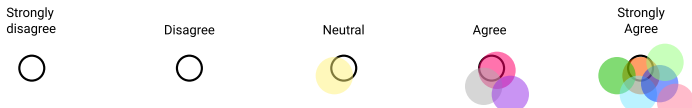
5) The platform made you excited and motivated to start your nicotine recovery



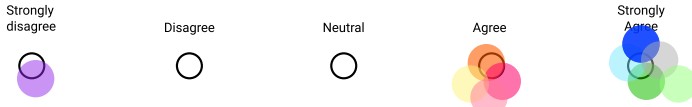
6) Your insights regarding mood, smoke free streak, and triggers were clearly visualized and motivating



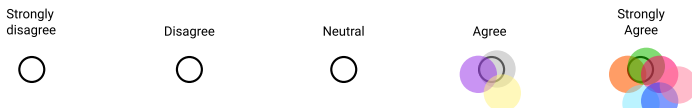
7) The community page is beneficial and practical, you feel connected to other users' journeys.



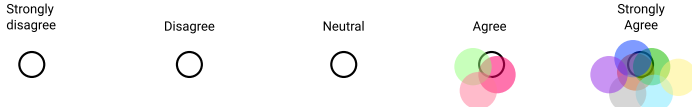
8) You can empathize with Gorby while seeing him reflect your emotional state.



9) Messaging people from your Gorby Lobby makes you feel supported and accountable



10) Your achievements felt motivating, achievable and clearly defined.



SUS Score

88.25

n = 10

Hi-Fi Changes

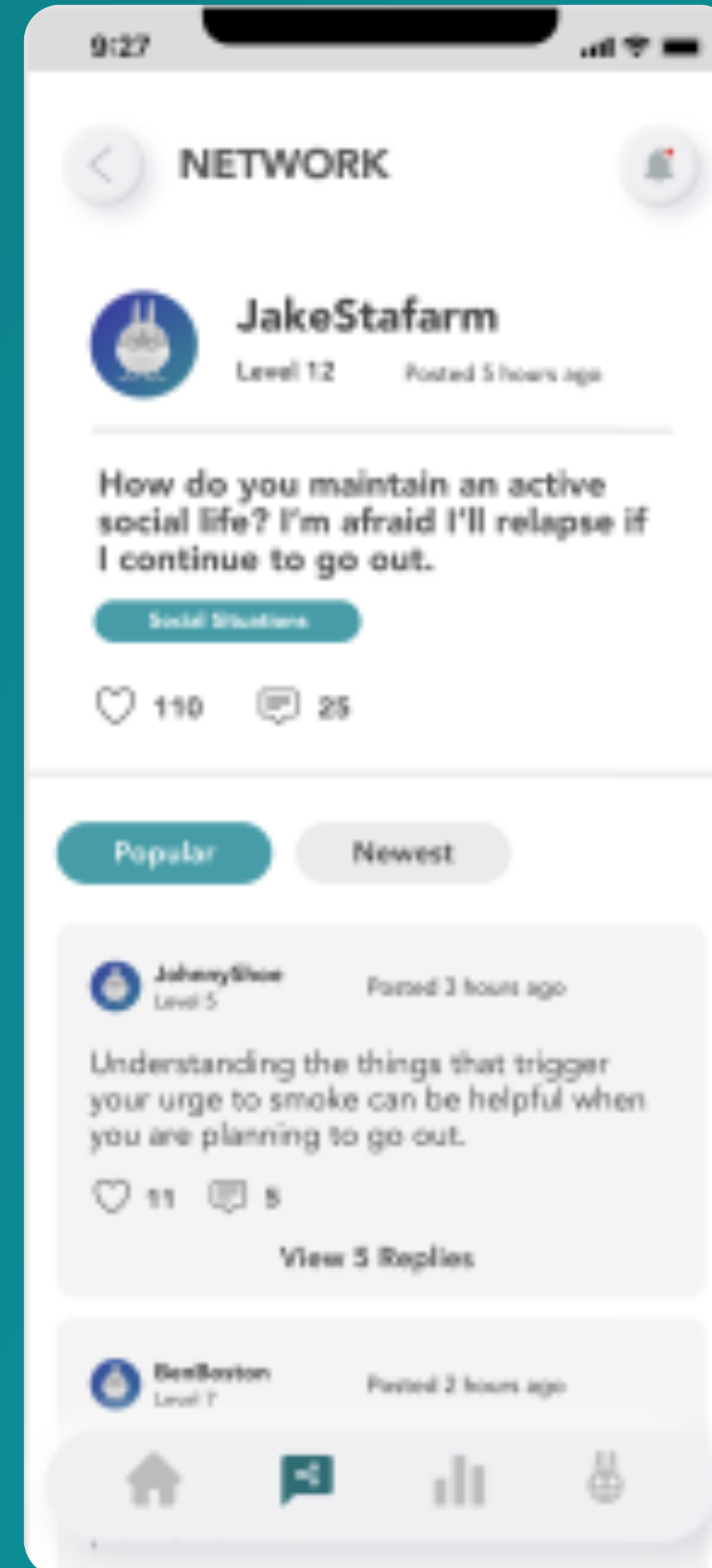


Using our testers feedback...

Gorby lobby - making it more interactive

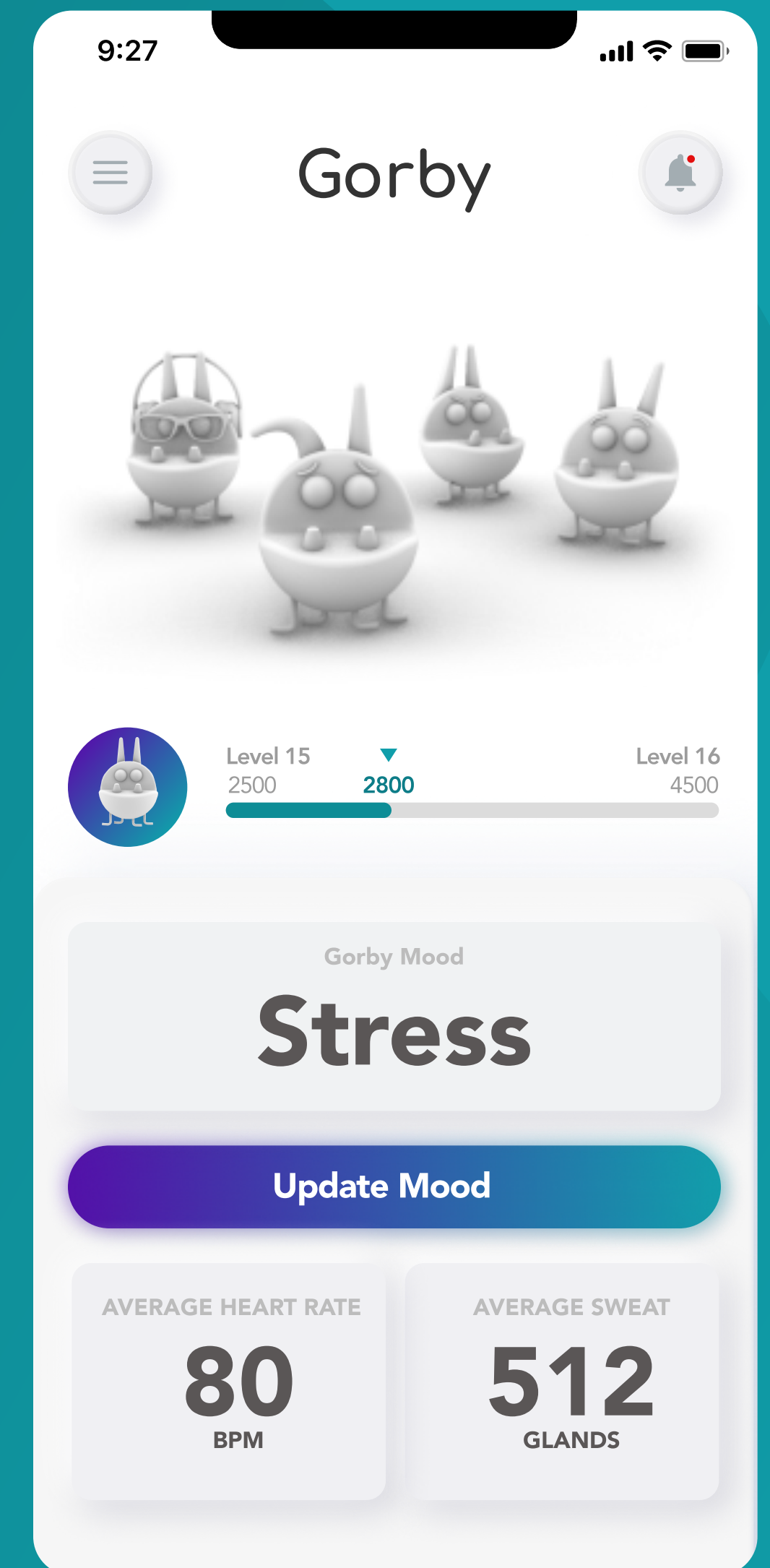
Social form - adding a feed to be able to see everyone you follow's posts and the topics

Avoid loosing points



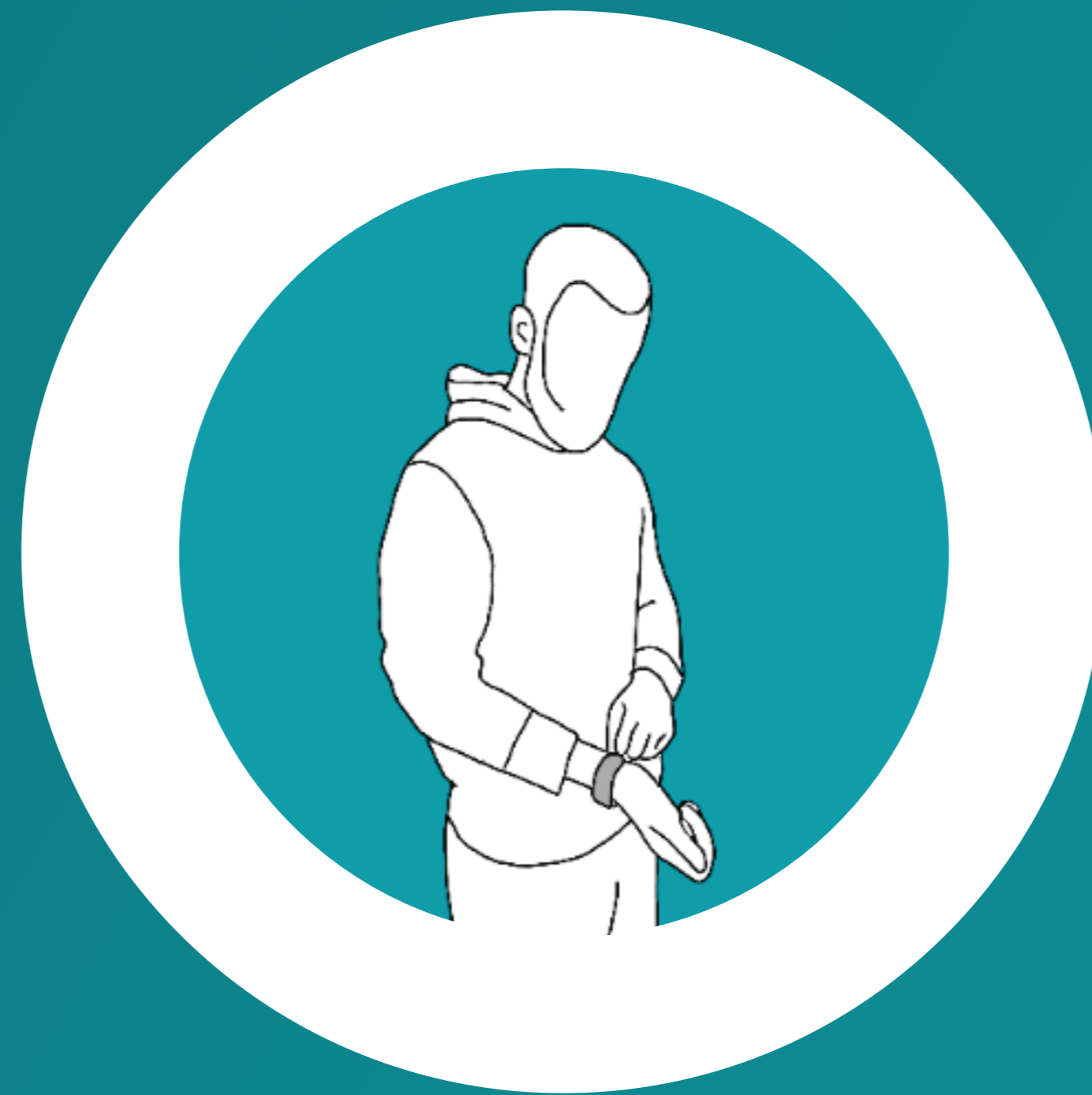
Overall

- “The lobby was a great addition, more interactive and more connection with other people”
- “I feel like the achievement portion, I shouldn't lose points and should be able to look into the future to see what I can earn to keep me engaged”
- “The forum was by far my favorite part of the application. I love the idea of networking with other random users who are trying to quit. I feel like I would find more connections with people that I can relate too”



Final Solution





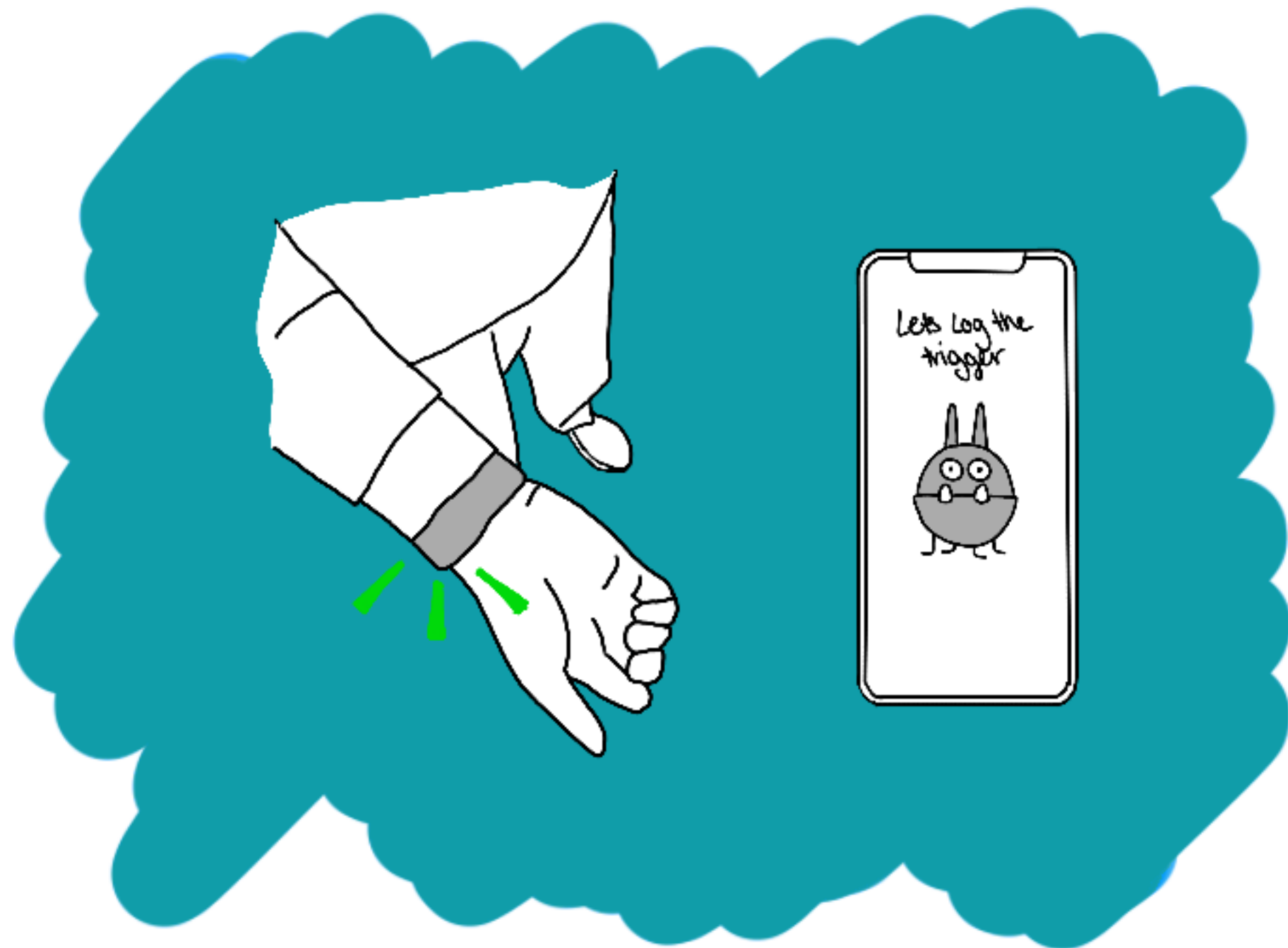
Drew's journey to successfully quitting his nicotine addiction.



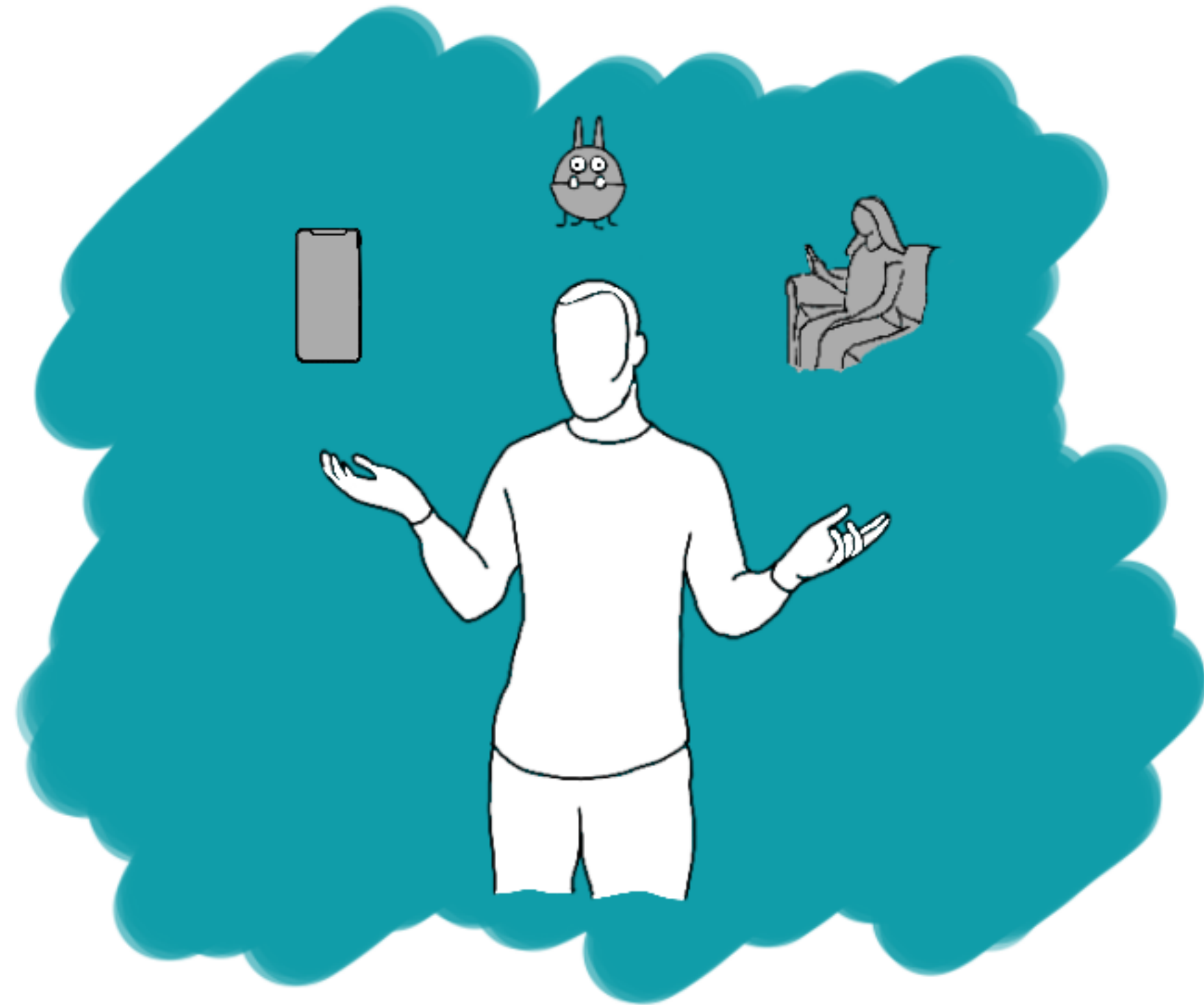
Drew is currently trying to overcome his nicotine addiction, he downloads the Gorby app and obtains his wearable bracelet to help him with his journey.



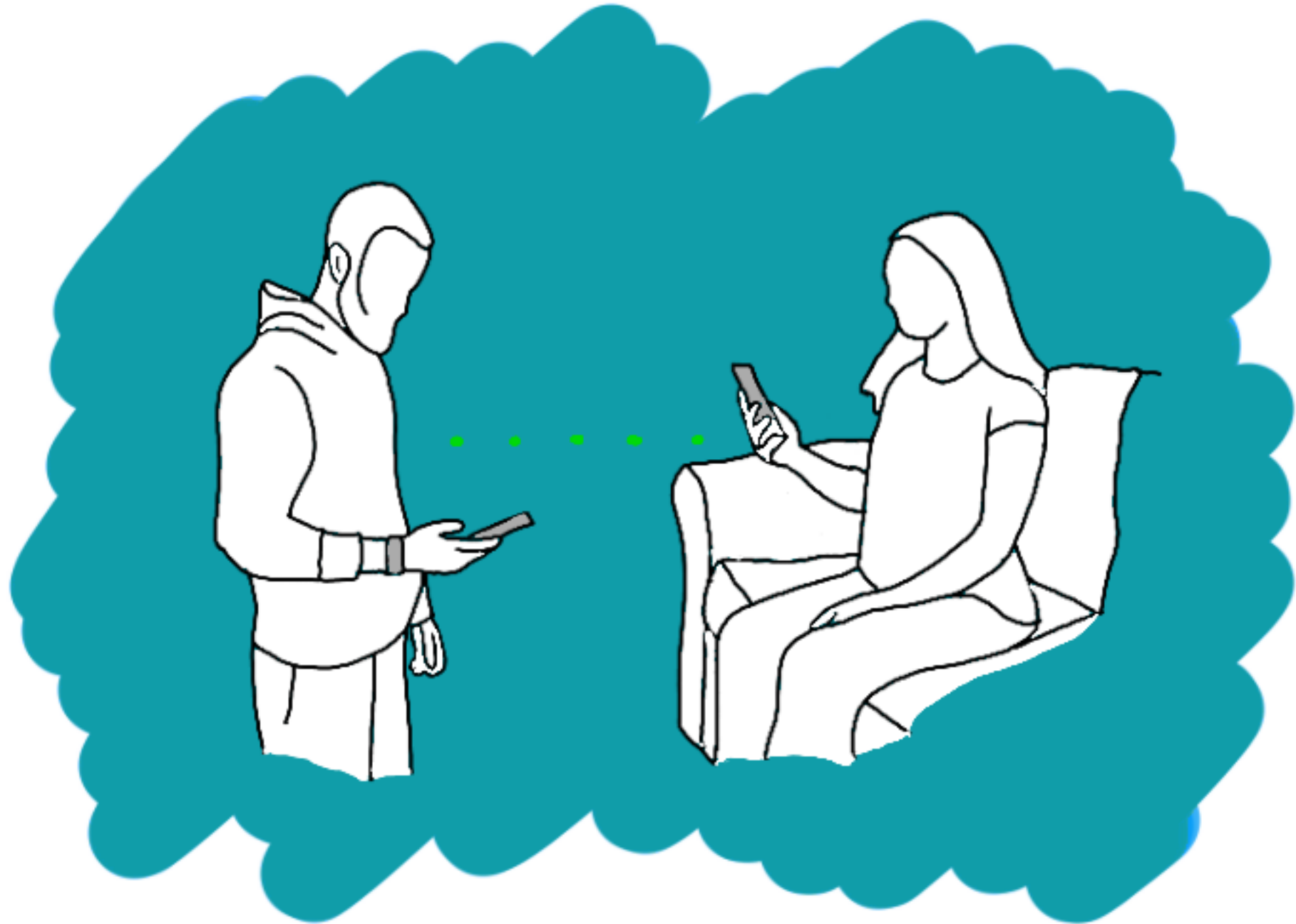
A few days later Drew goes to his friends house for a party, there are a lot of people smoking, he eventually gives in to the social pressures.



His wearable detects the smoke and quickly helps him by going through the steps to log his trigger.



Although Drew had this slip up, he can now successfully quit smoking by understanding his triggers, visualizing his insights with gorby, and connecting with his supportive network.



Gorby helps Drew remove himself from the situation and connects him with his network for further support.

chapter 4

Deliver

Branding



Gorby

Curb Your Cravings

Typography

Titling

Comfortaa

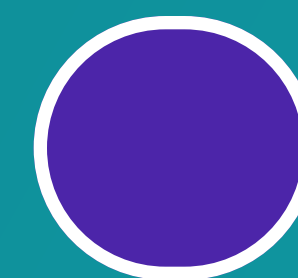
Body

Avenir

Primary Color



Secondary Color



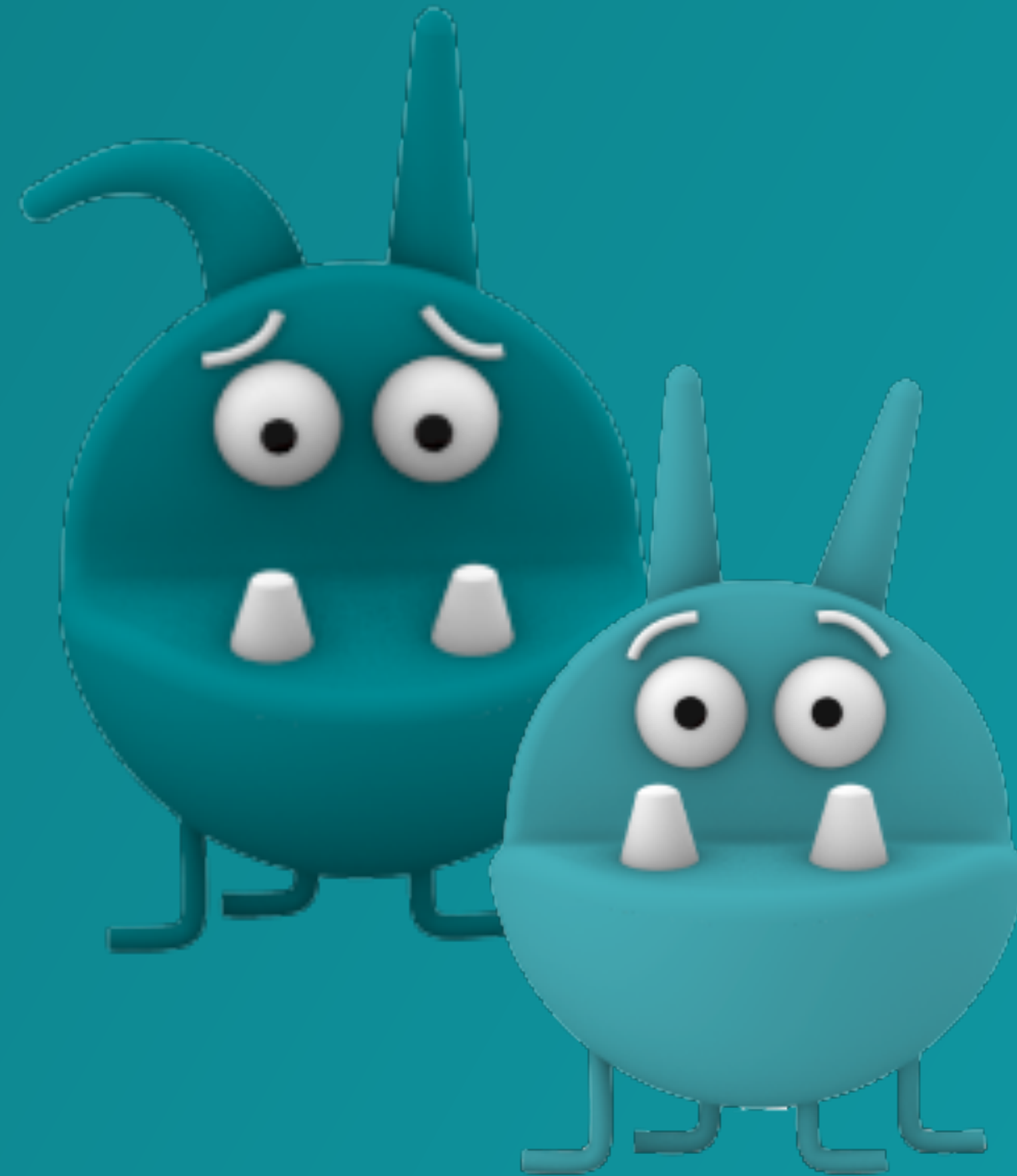
Branding Color

Meaning of calmness, emotional healing, sympathetic, self-awareness, and trustworthy

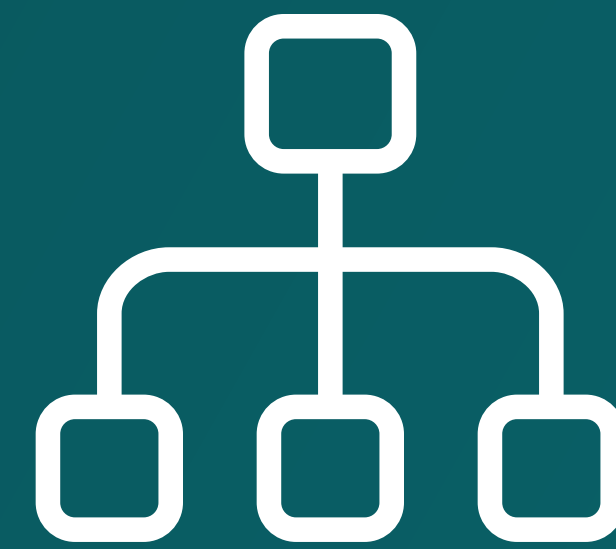
Brand identity

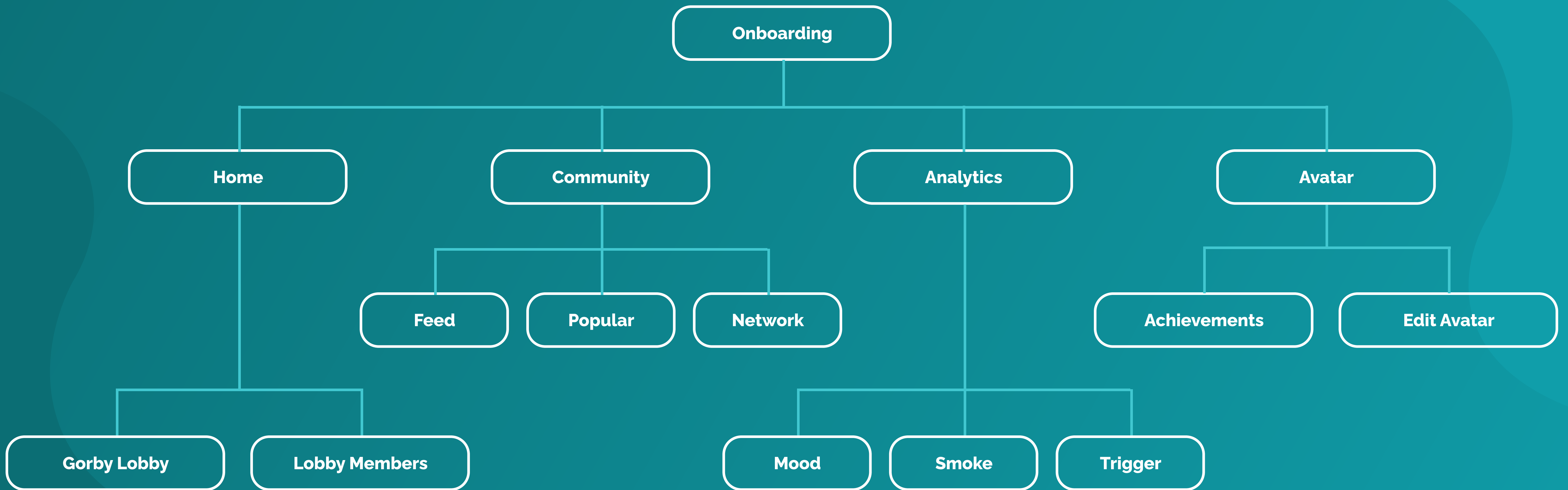
Gorby is our brand mascot

Gorby helps build and strengthen the brand identity. Whenever people see the mascot, they could quickly recognize our brand

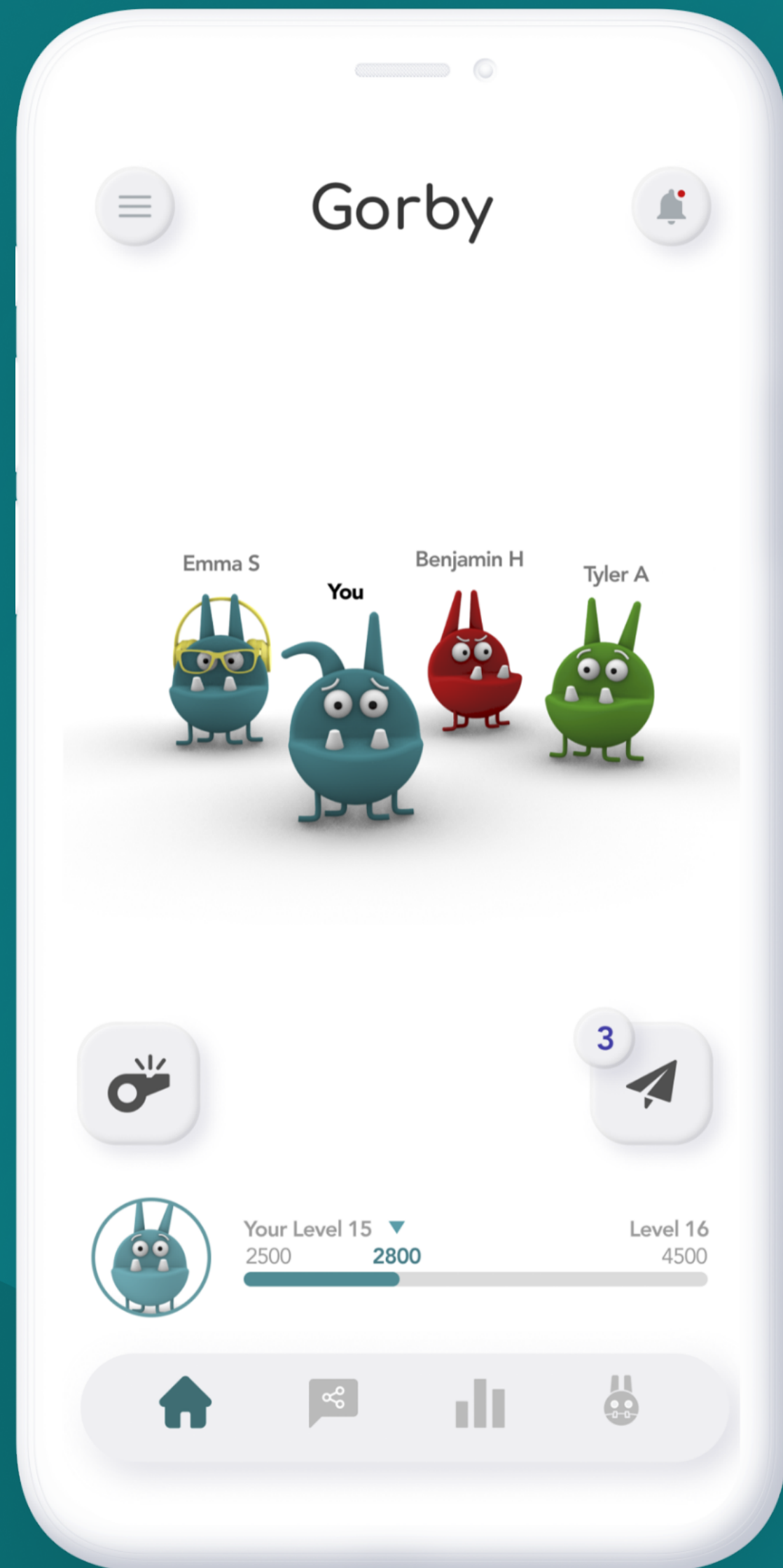


Site Map





Home Page



The Gorby Lobby

Gain more Gorby's in lobby through social form

Looby is the only thing in the home page (dispite level info)

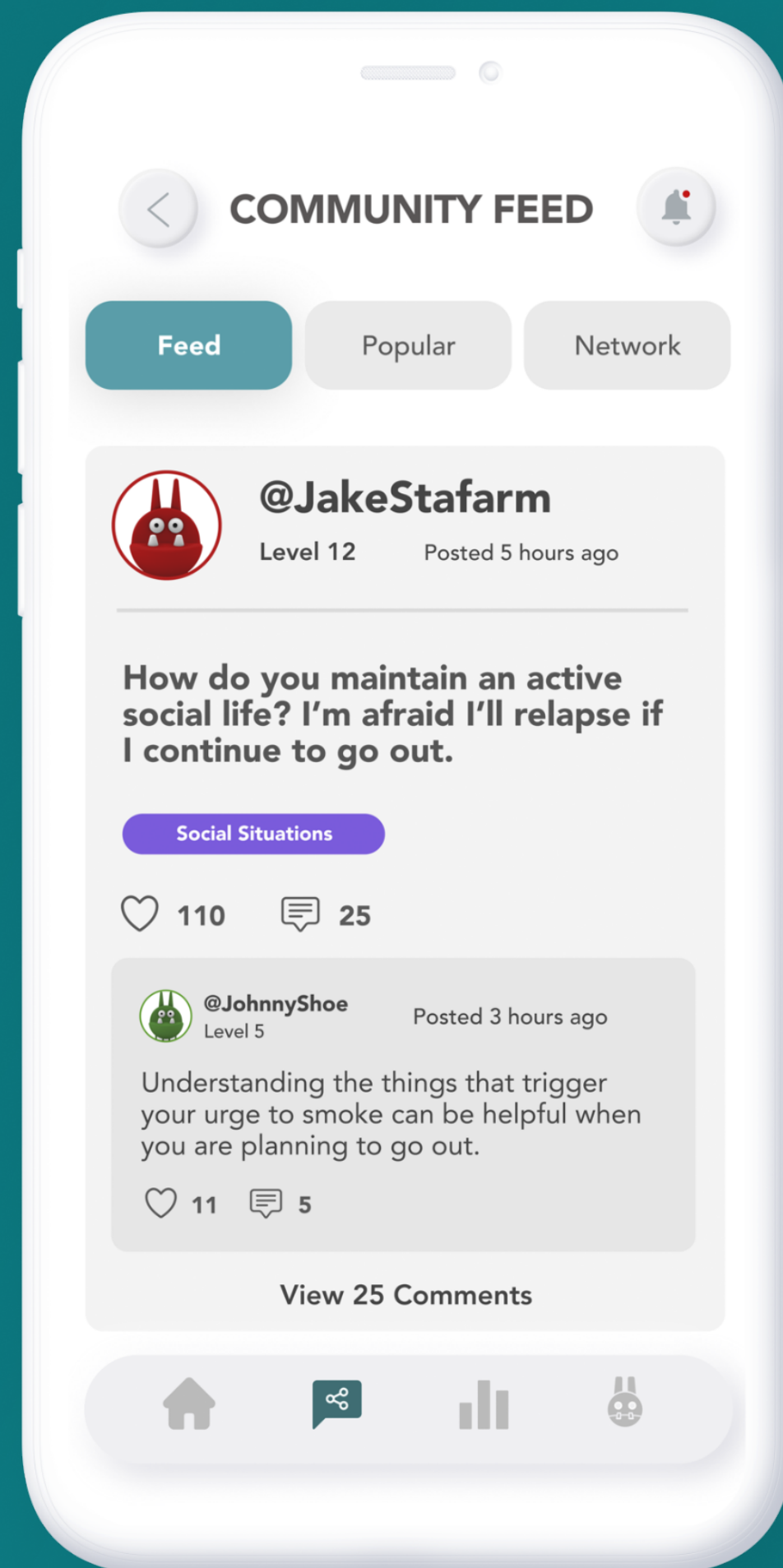
Whistle to call all the Gorby to attention

Maximum of 15 Gorby's of your network (people you meet in the form and the poeple you are real friends with that download the app)

AI would be an addional 3 in the background (hanging out)

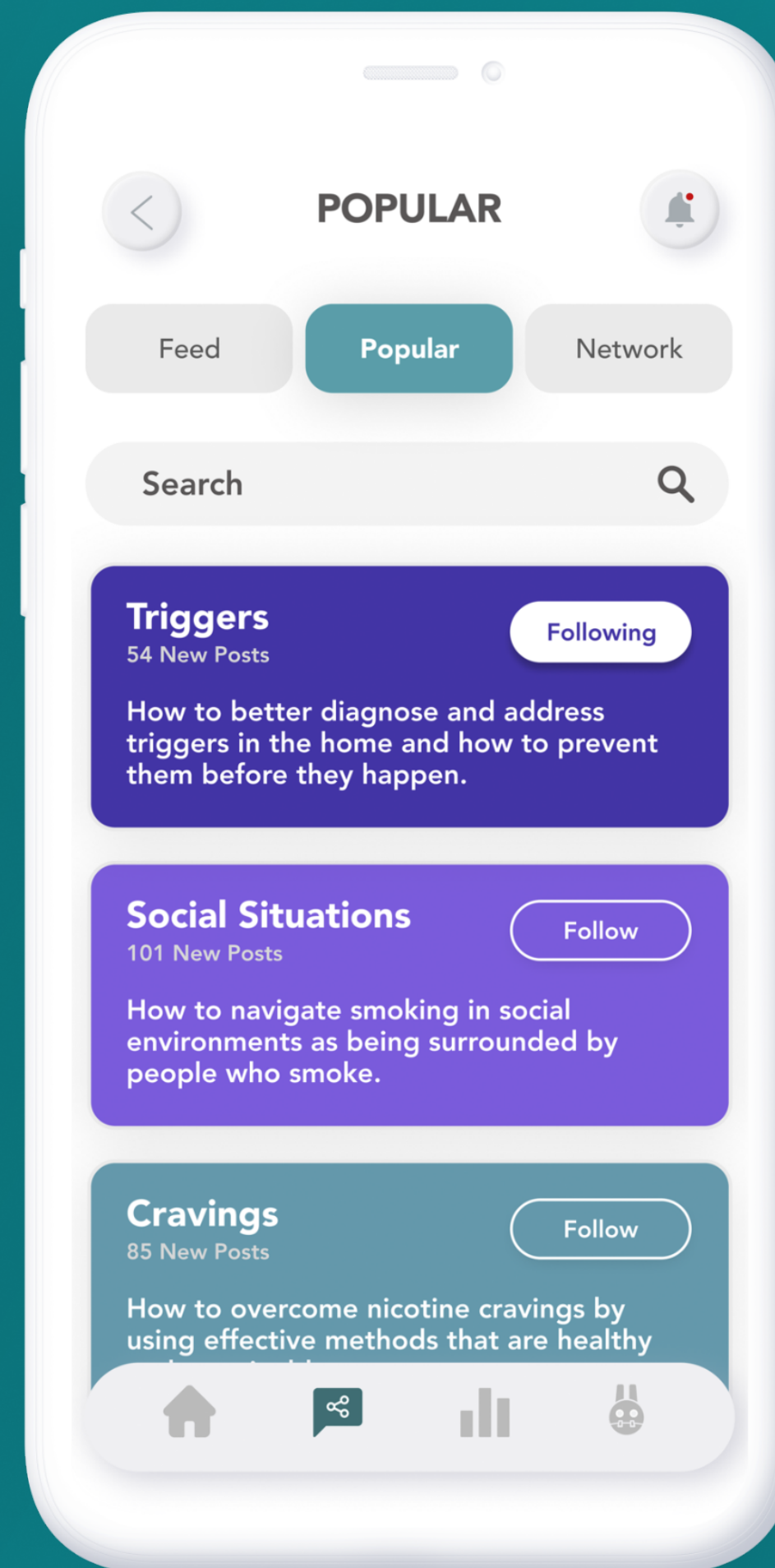
Airplain button that will show list of people in your lobby (ease of use) that you can messege

Feed



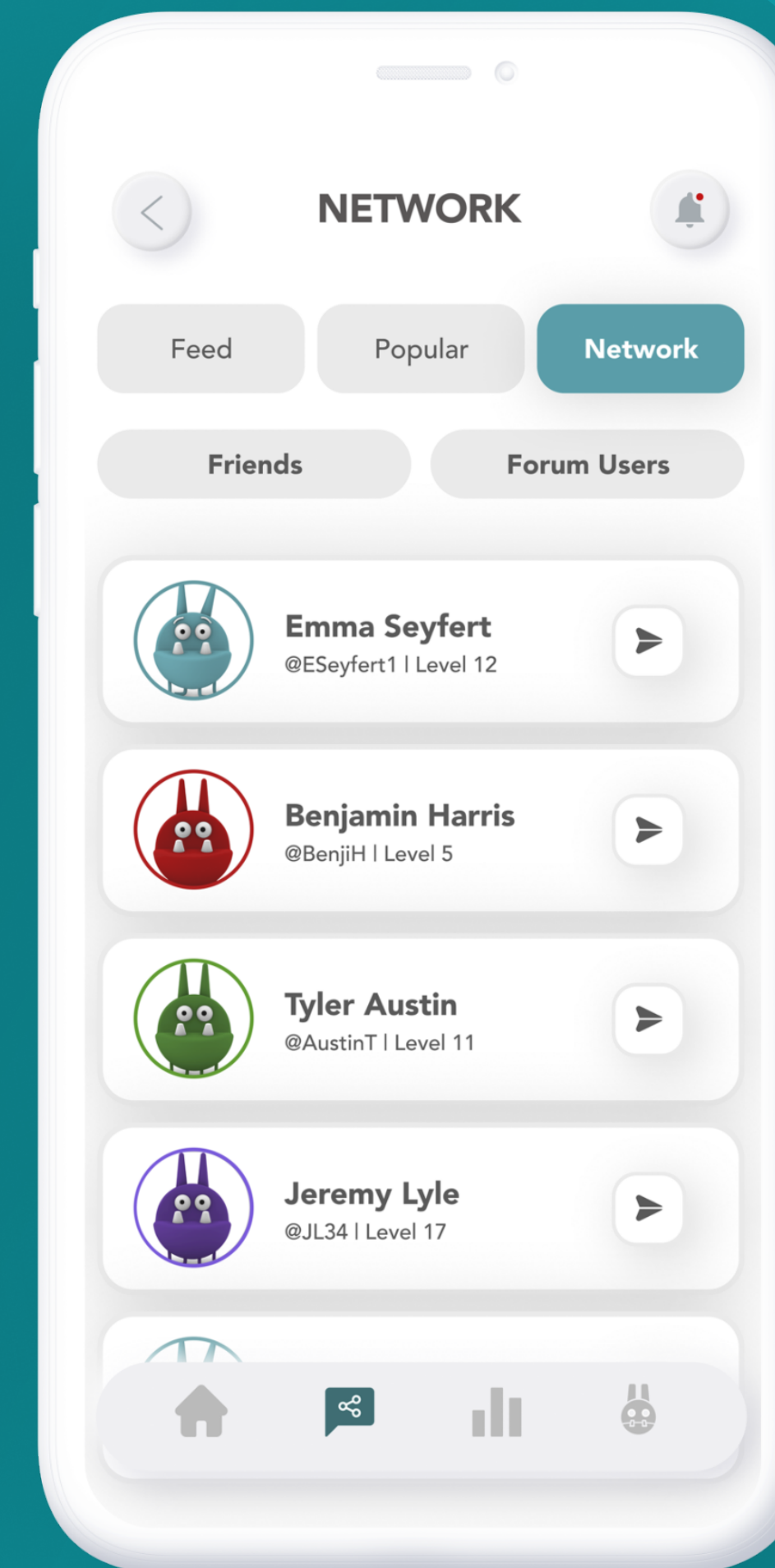
A list of everyone that your are following, people that are supporting you and random people that you added from this page.

Popular



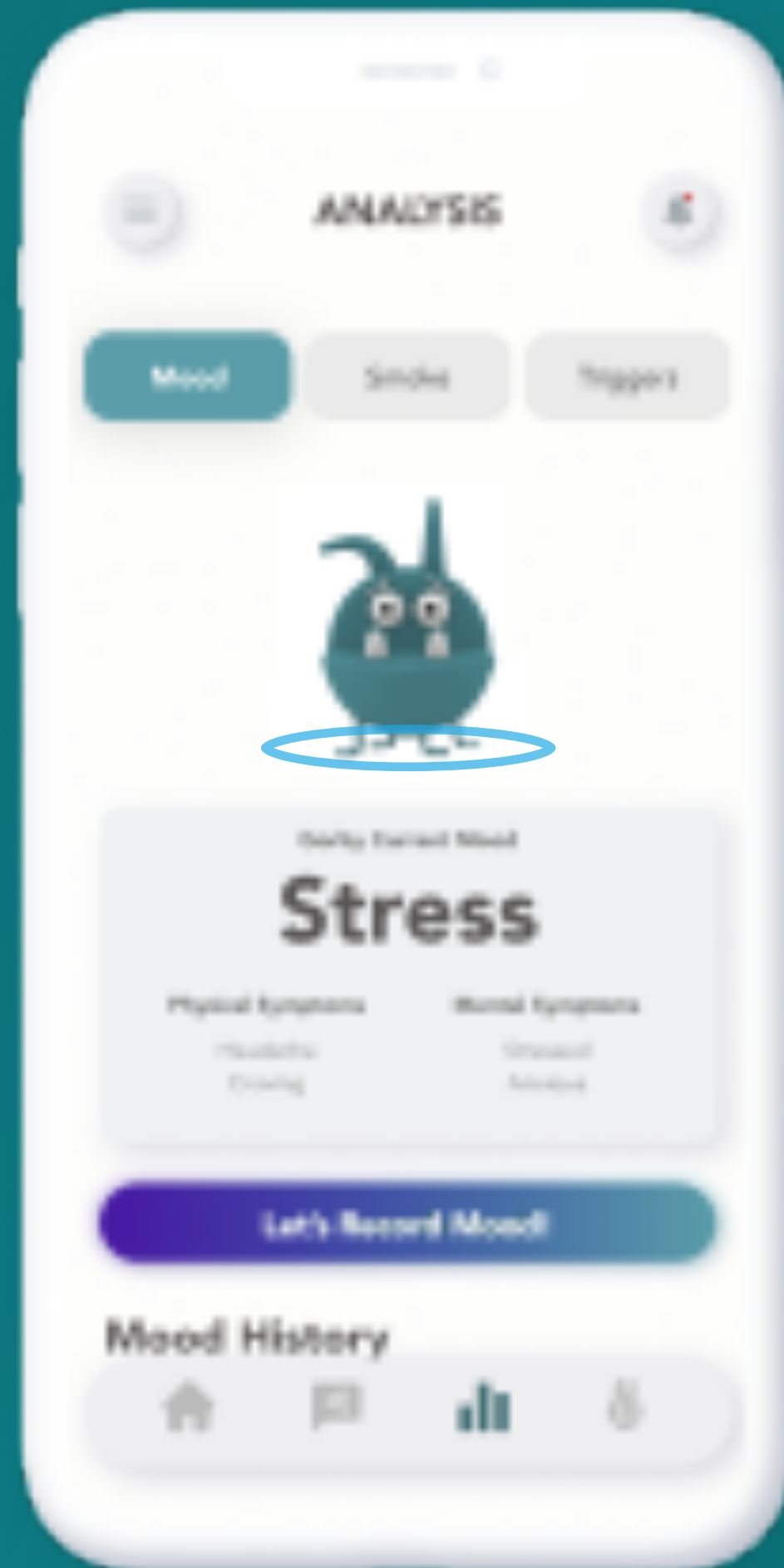
See all the posts from your network the additonal people you are follow and the posts from the topics you are following.

Network



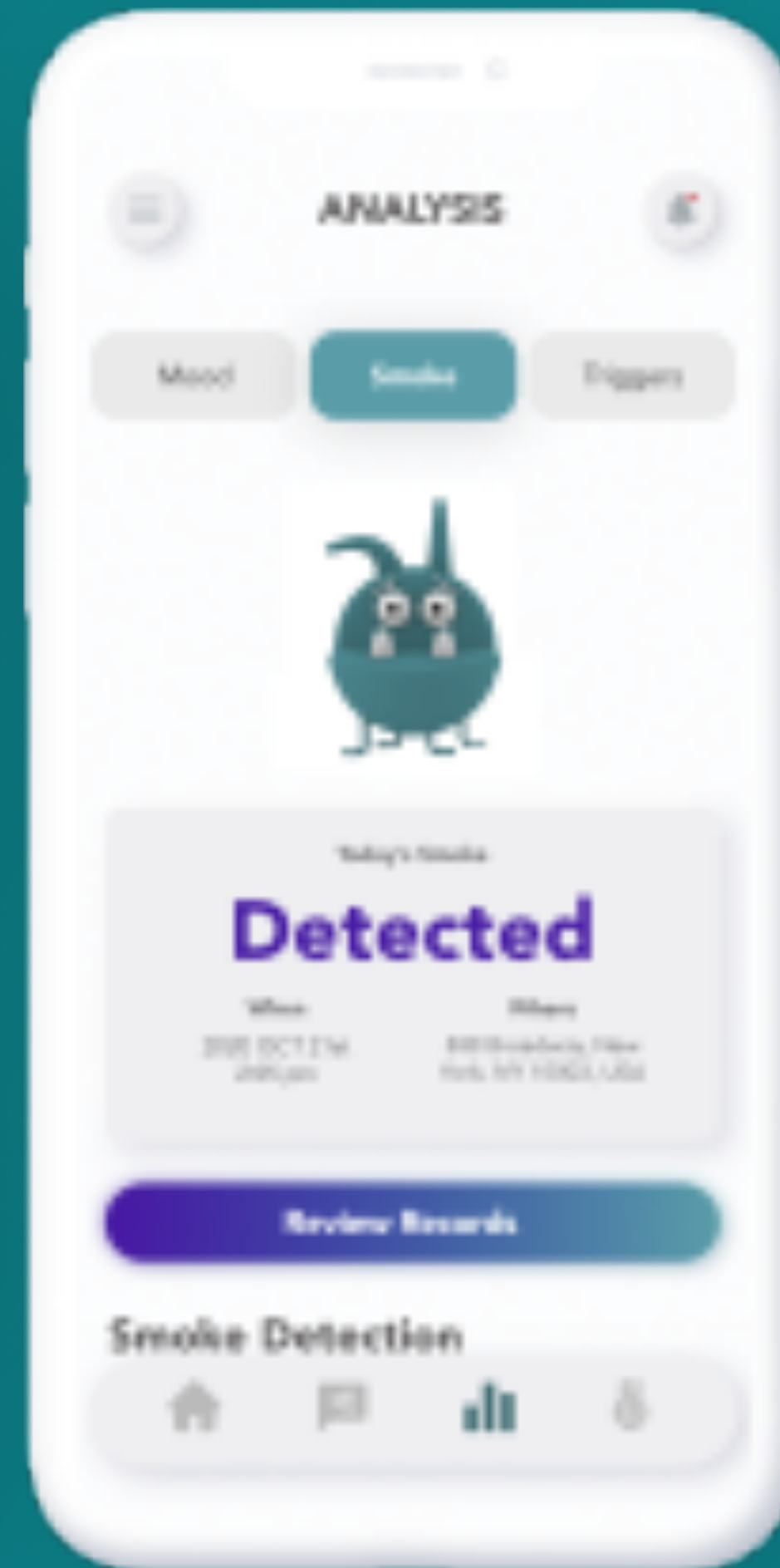
Show the Topics that we put on for the user (most popular) and the topics that you are currently following

Mood



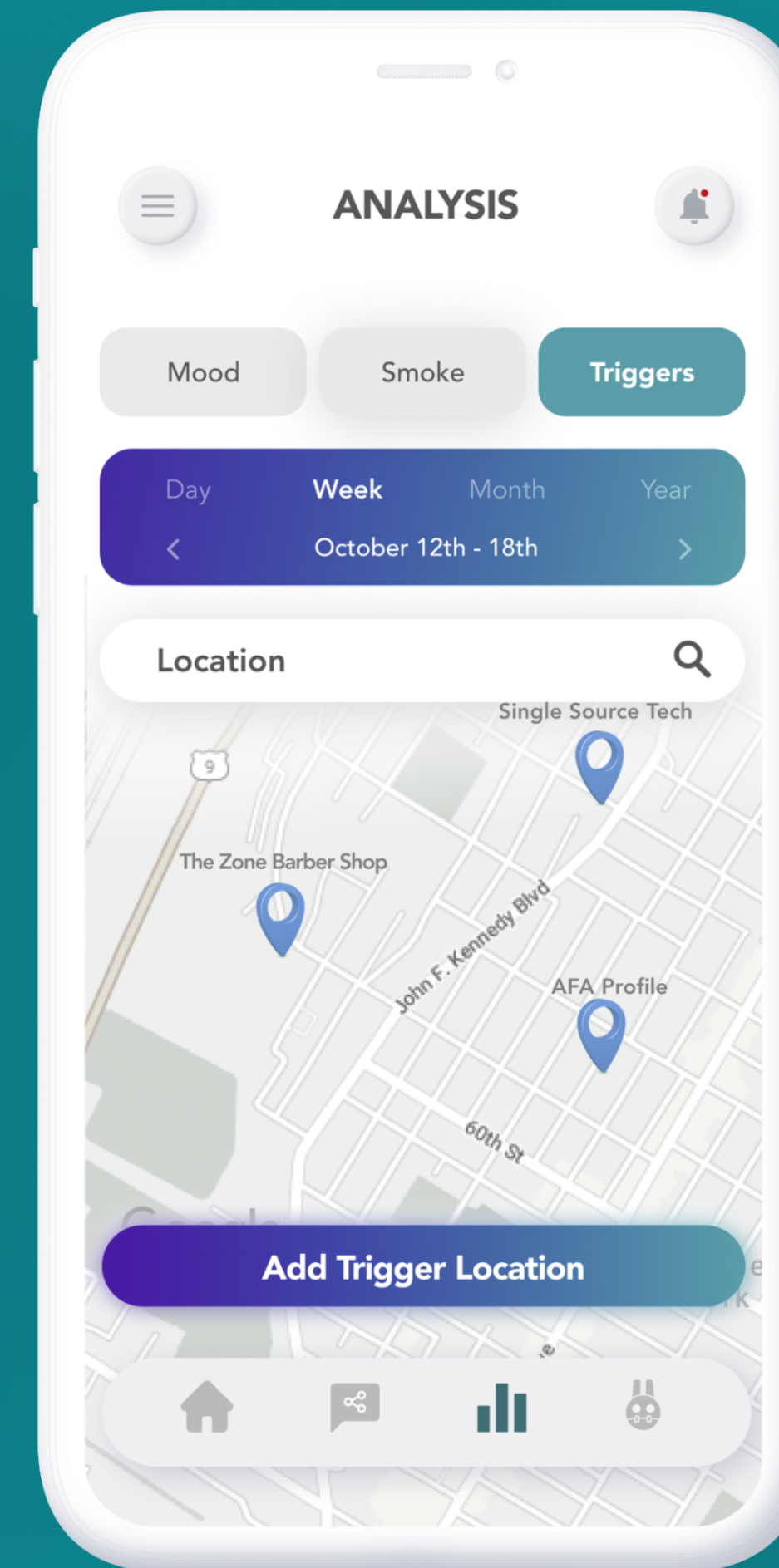
Show your mood from your most recent daily log with the expressed Physical and mental symptoms. Can log a new mood and will display your mood history. Blue Ring around GORBY will show if you have reviewed your insights. When you completed this it will go away.

Smoke



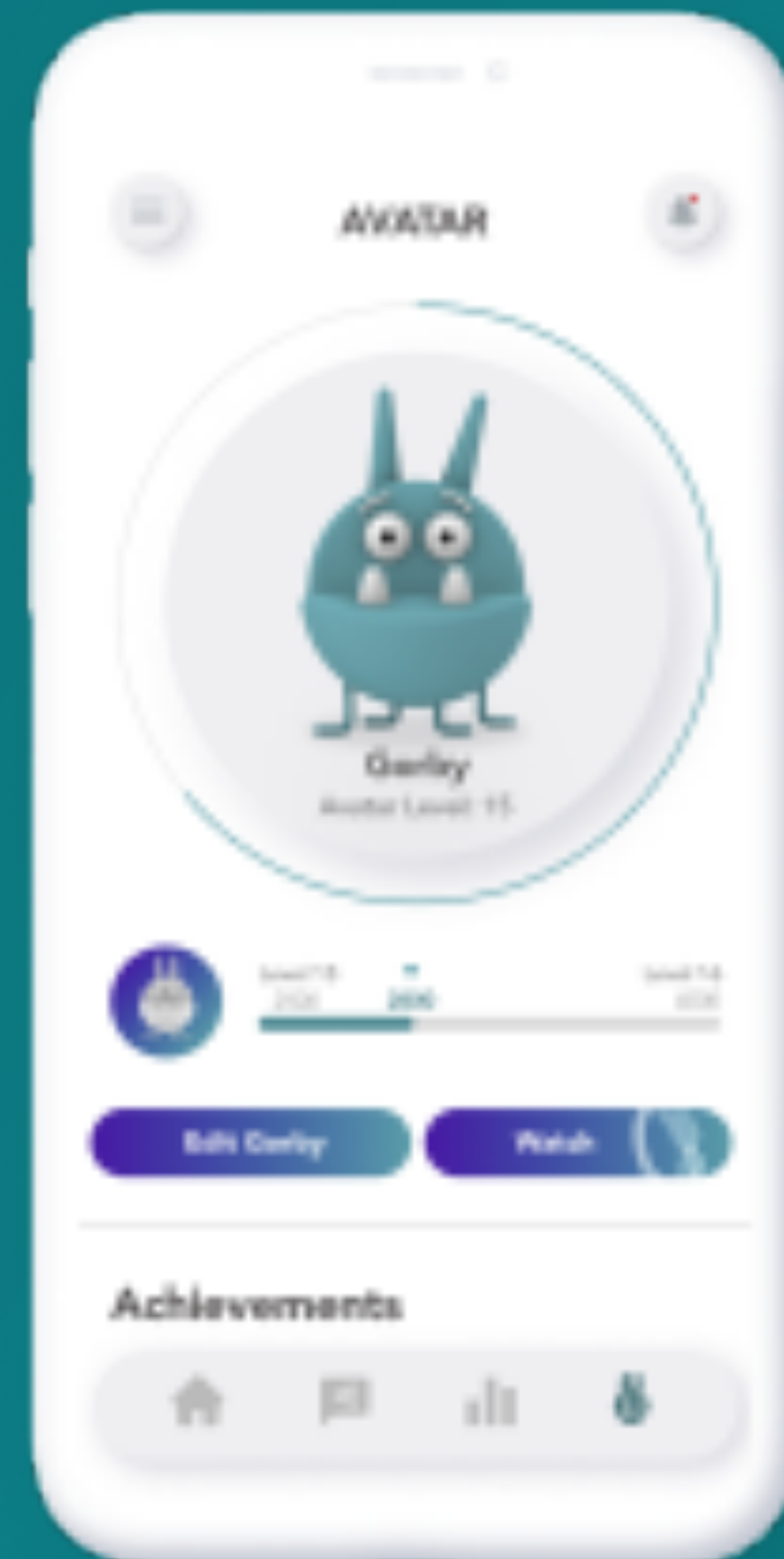
Show when smoke was detected - all notifications (when and where)
Your streak of not detecting any smoke

Triggers



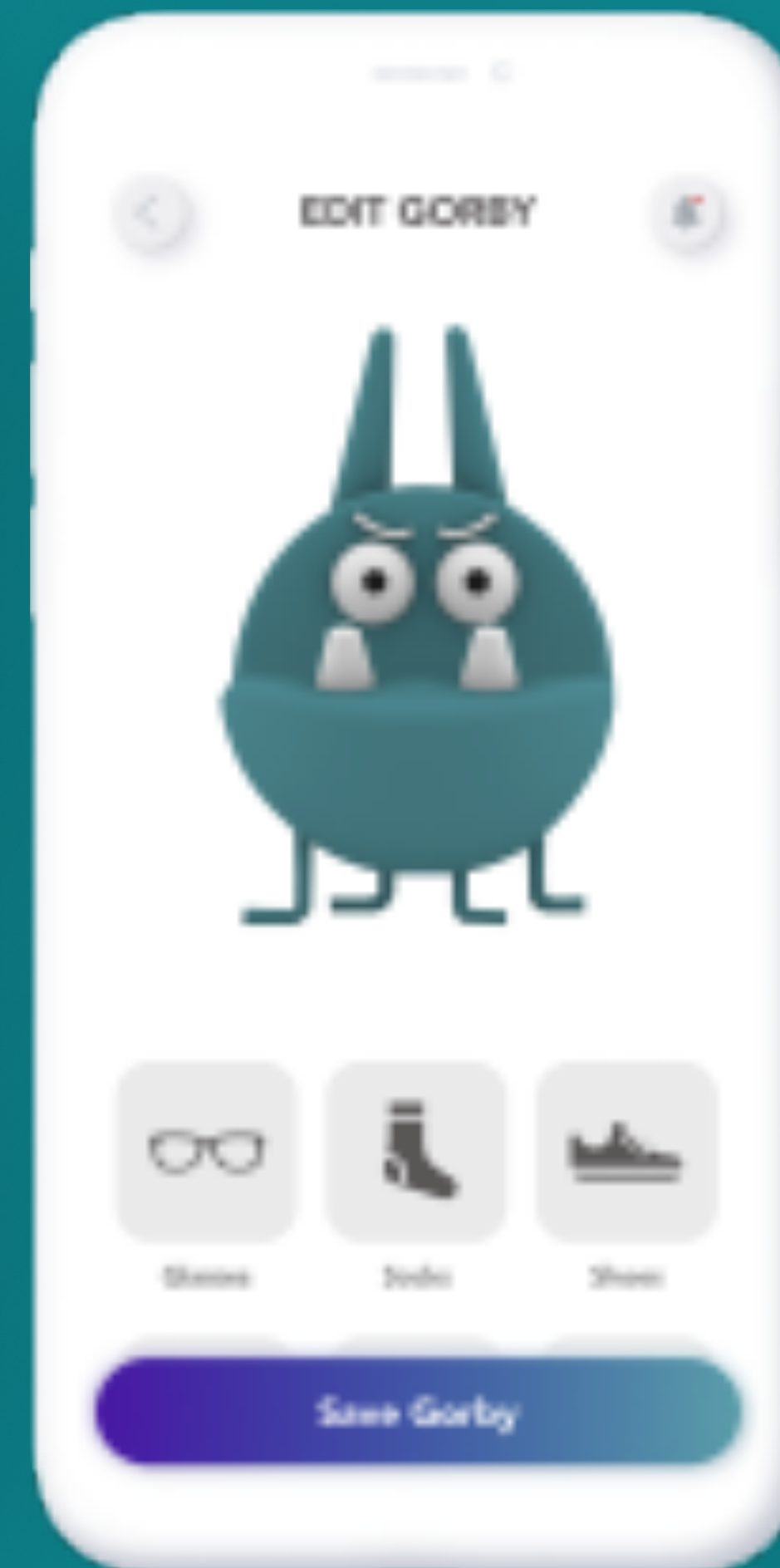
Review their pin pointed triggers and more info about them.

Gorby Avatar



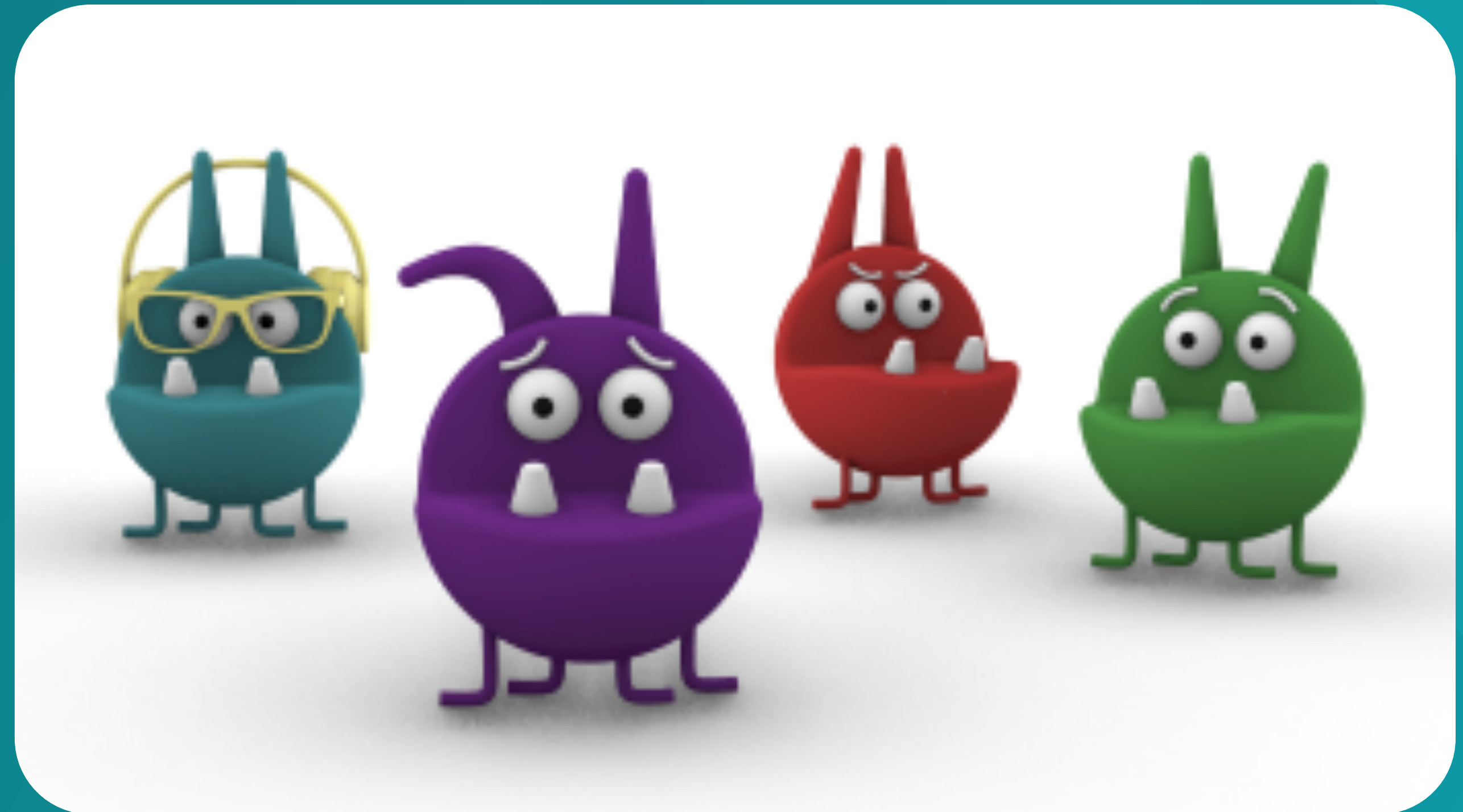
Check achievements and your level. User quote: "Appreciate the fact that it not only tracks my information but can also help motivate me to achieve milestones"

Edit Gorby



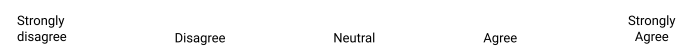
Customize your Gorby with unique accessories including glasses, socks, shoes, shirts and colors.

Gorby Appearances



User Testing Questionnaire

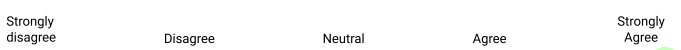
1) It is easy to get familiar with the platform



2) You felt the application paired with the wearable would support you in the suggested scenarios



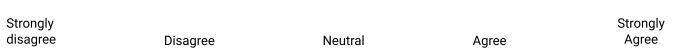
3) You felt in control of the interaction, it is logical and predictable



4) You were able to understand the navigation icons in the application



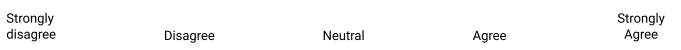
5) The platform made you excited and motivated to start your nicotine recovery



6) Your insights regarding mood, smoke free streak, and triggers were clearly visualized and motivating



7) The community page is beneficial and practical, you feel connected to other users' journeys.



8) You can empathize with Gorby while seeing him reflect your emotional state.



9) Messaging people from your Gorby Lobby makes you feel supported and accountable



10) Your achievements felt motivating, achievable and clearly defined.



Hi-Fi Second Round User Testing Results

SUS Score

81.25%

Percentile Ranking

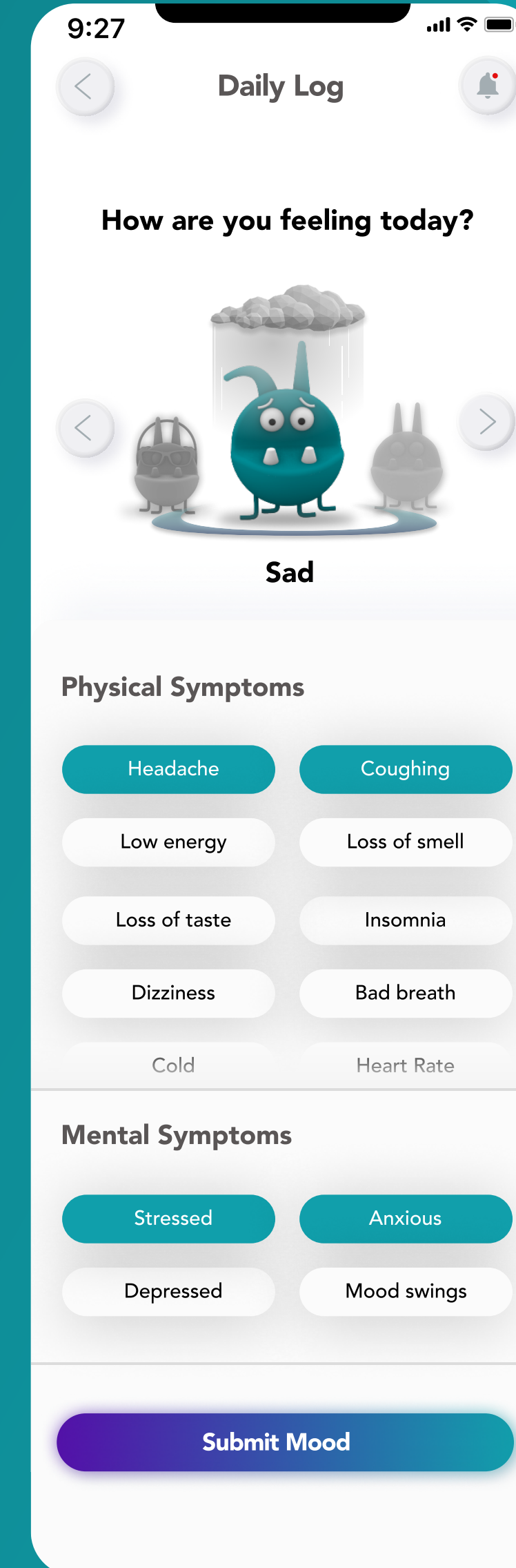
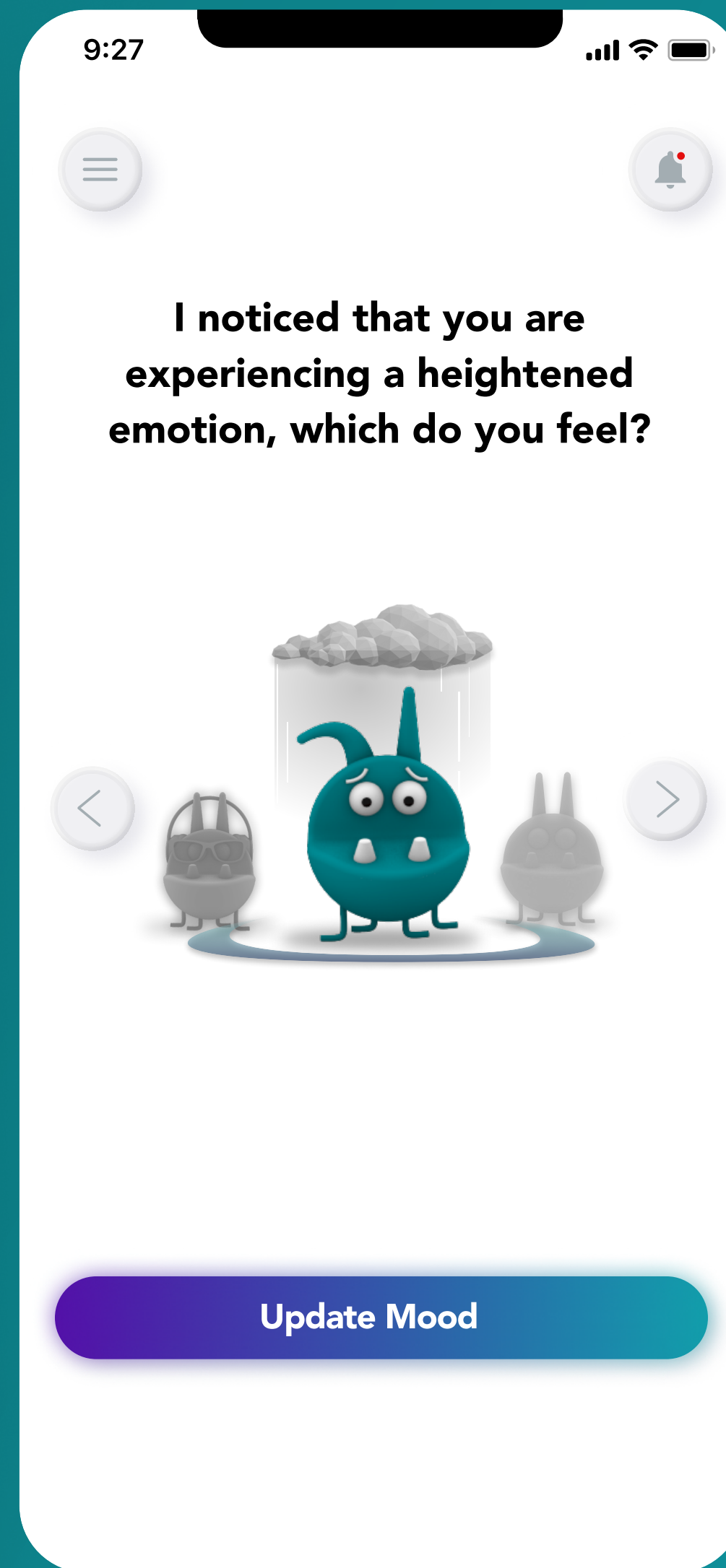
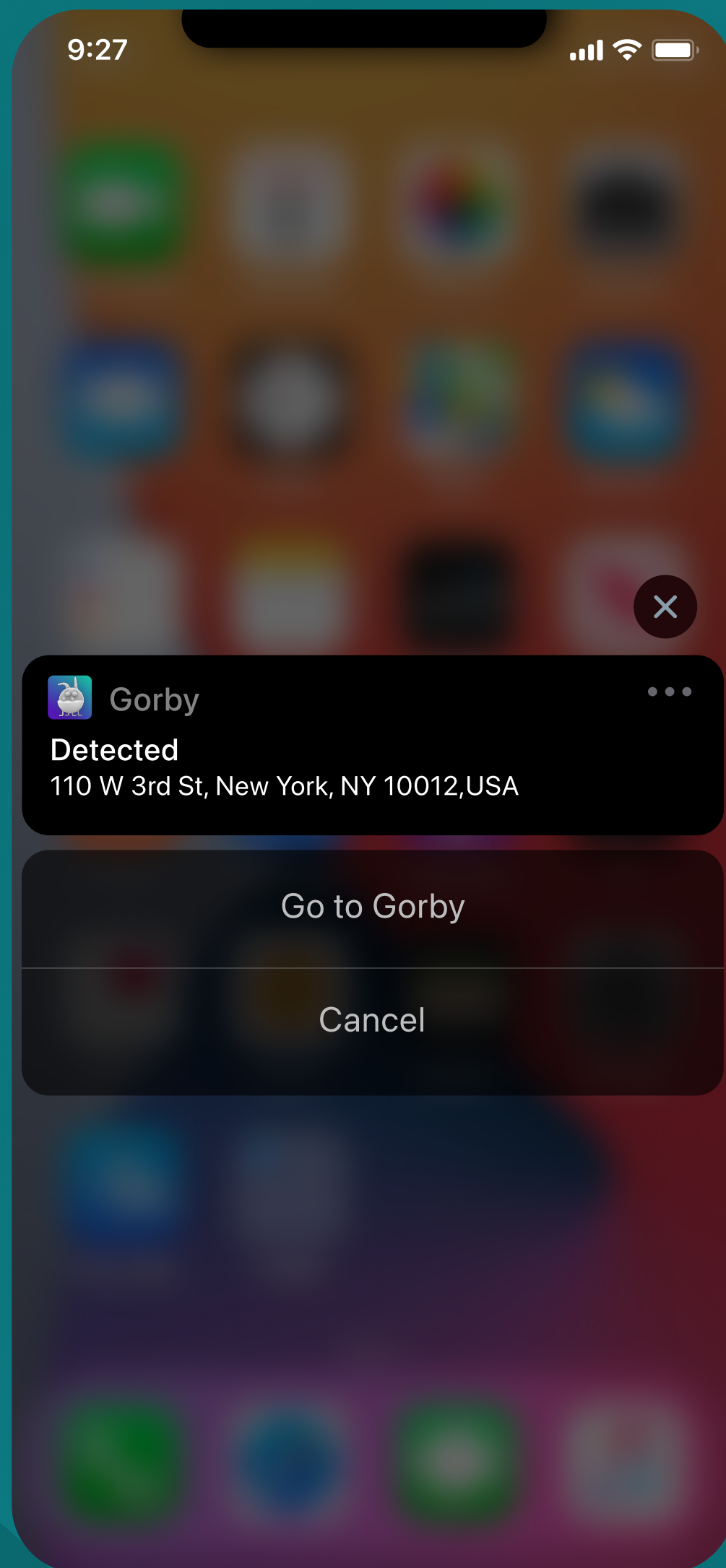
n = 6

User Scenerios



Scenerio 1. Hightened Emotional State

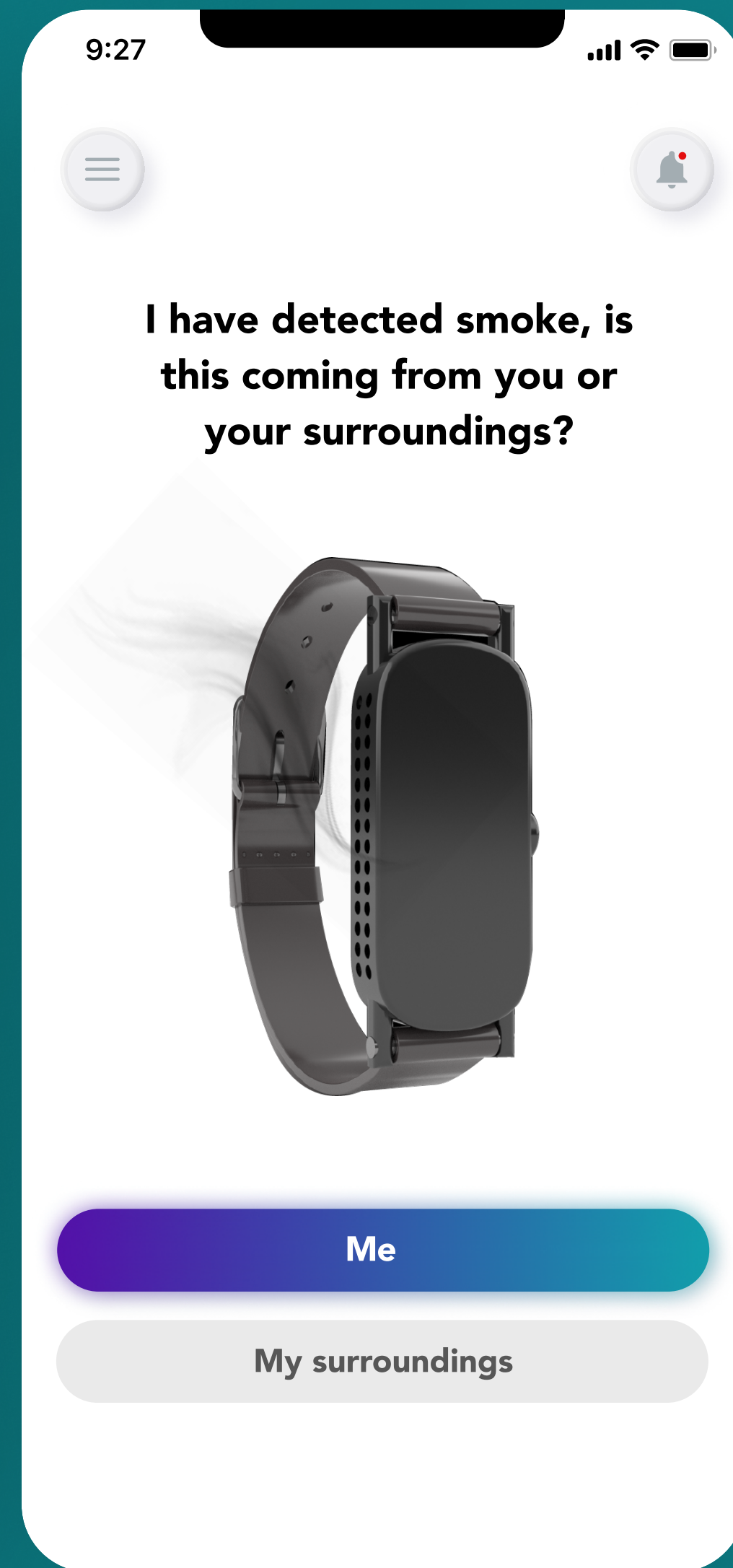
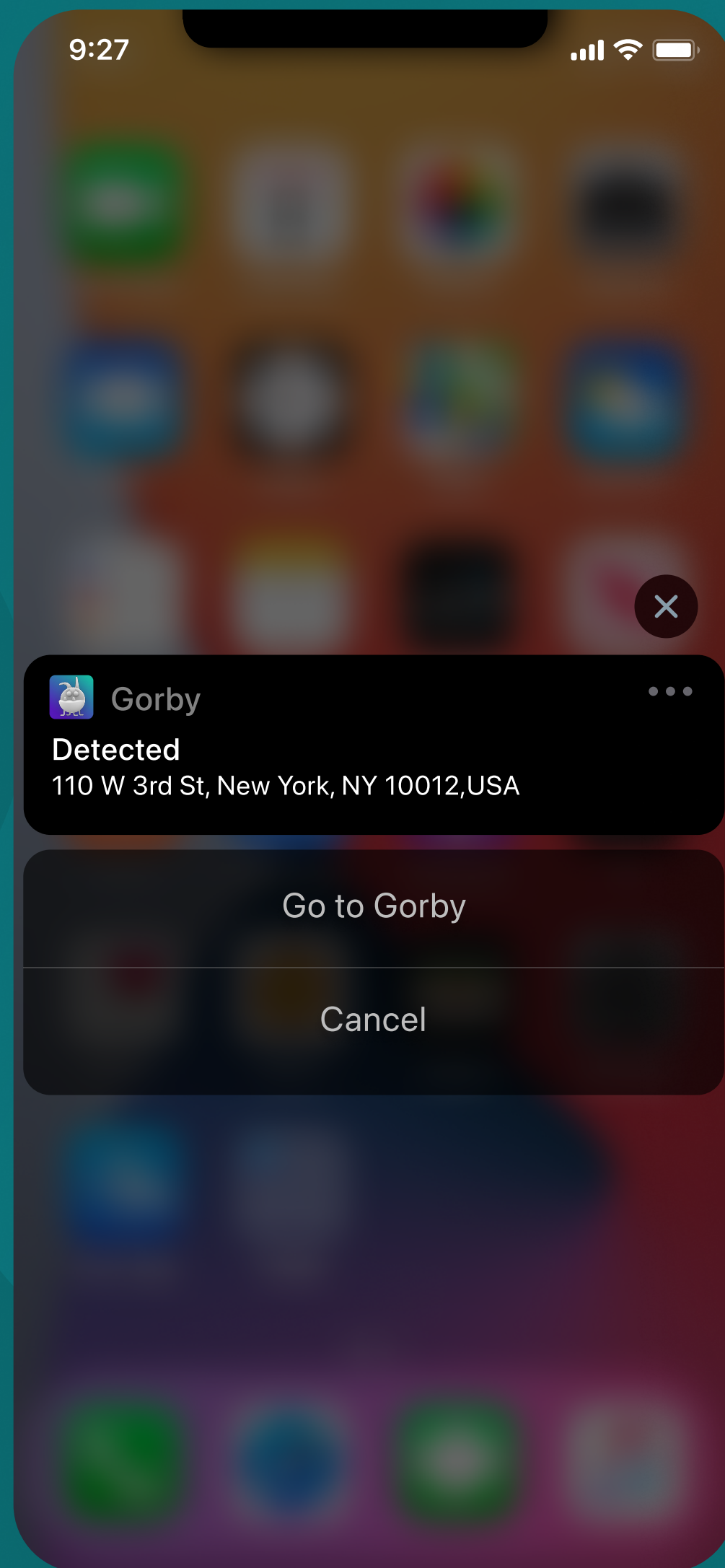
If the wearable detects a highted emotion through the GSR componet and the heart rate sensor you will recive a pin notification to open your app and update the application (mood). This is where you will be told that you are experiecing a hightened emotion and the user will be asked to pick which hightened emotion they are experience. After they pick which emotion they are experiecing, Gorby will refect this current feeling. You will also be prompted to connect with your network if the user would choose to do so.

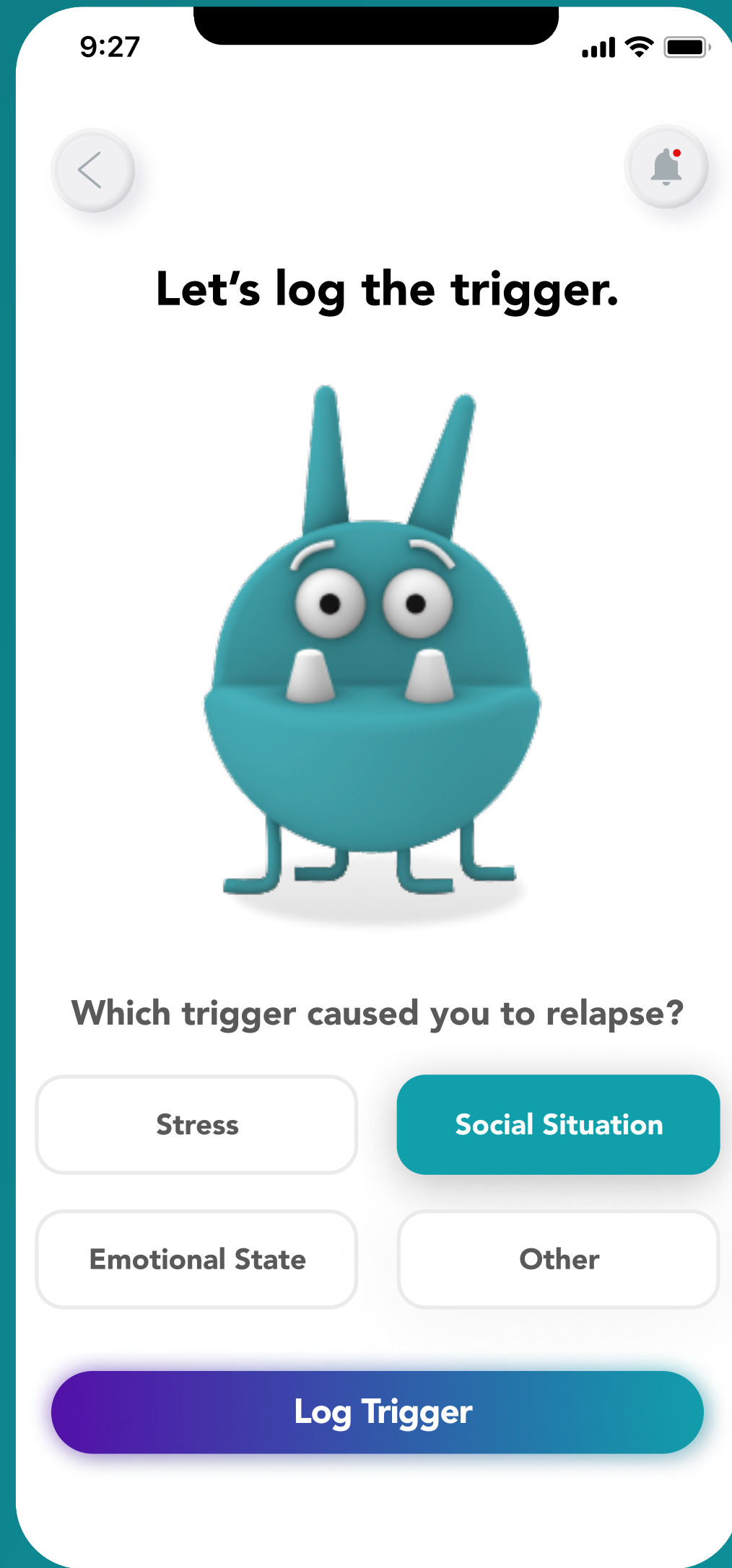
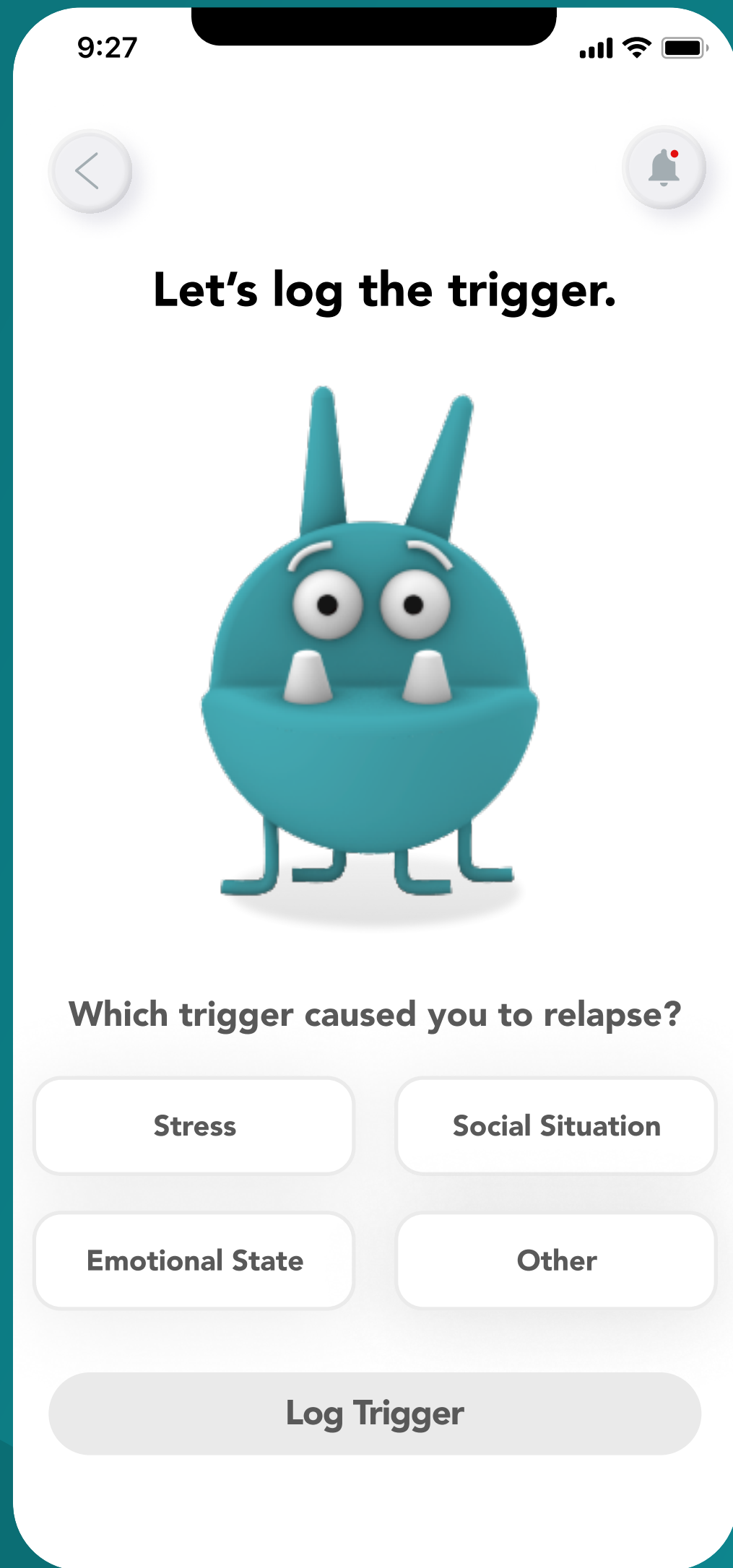


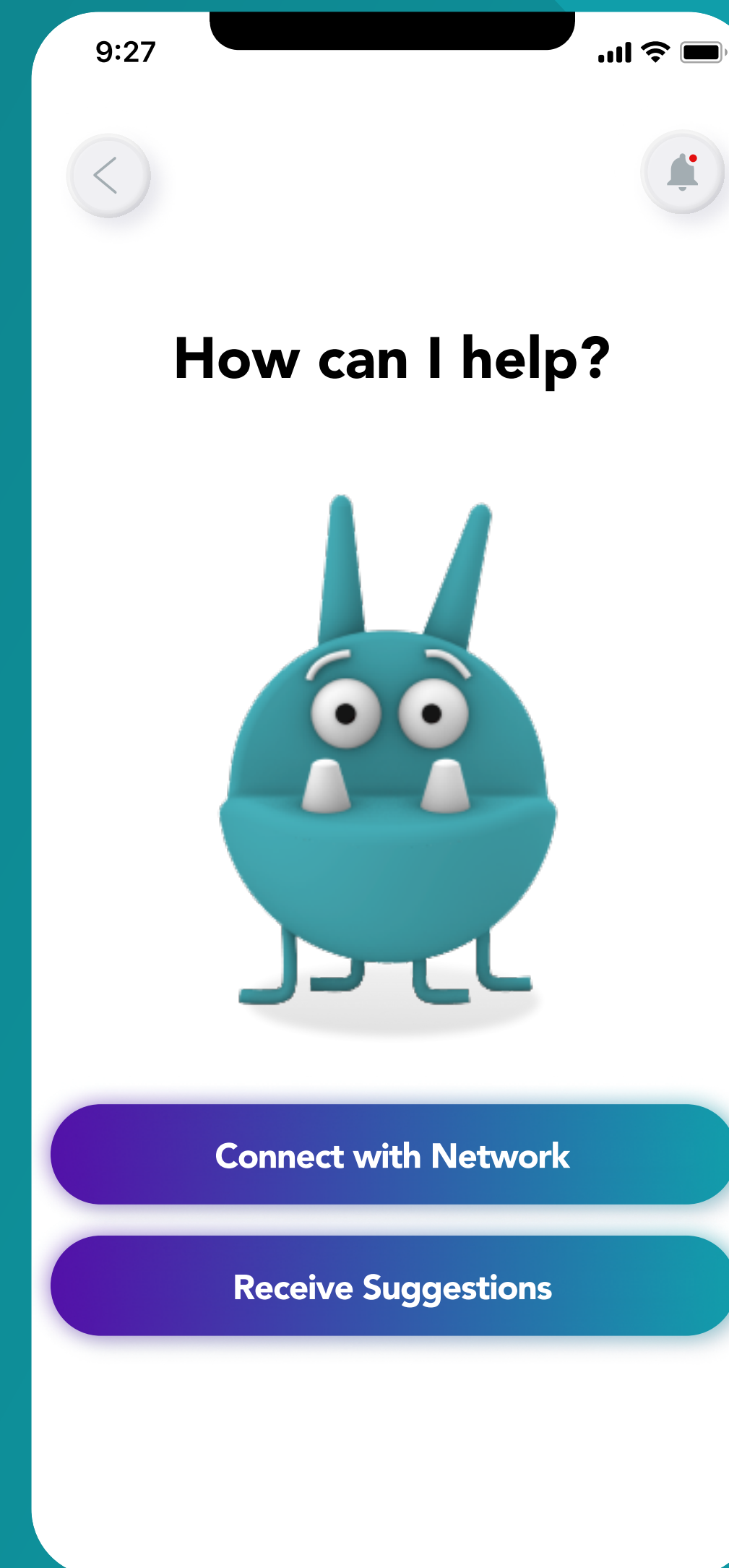
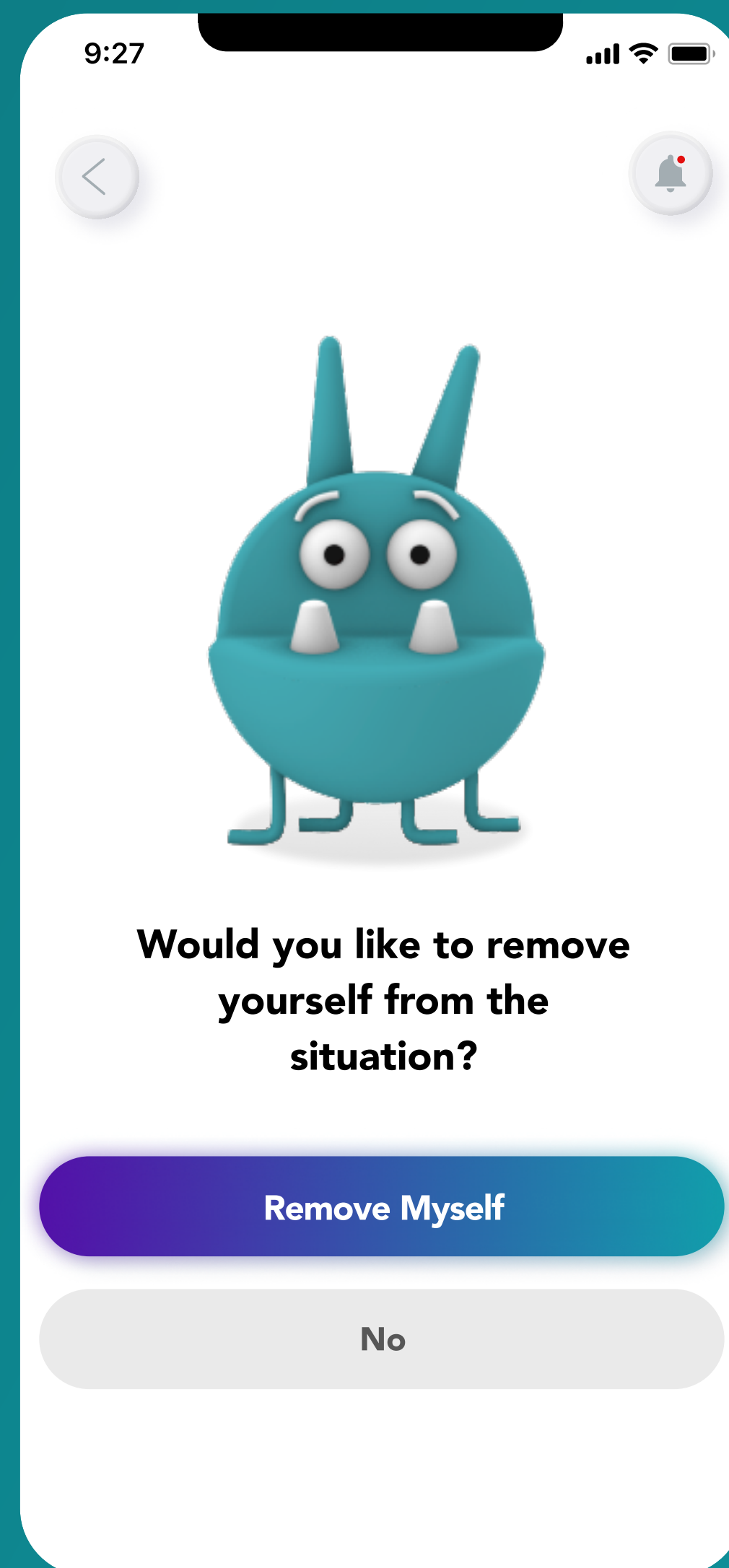
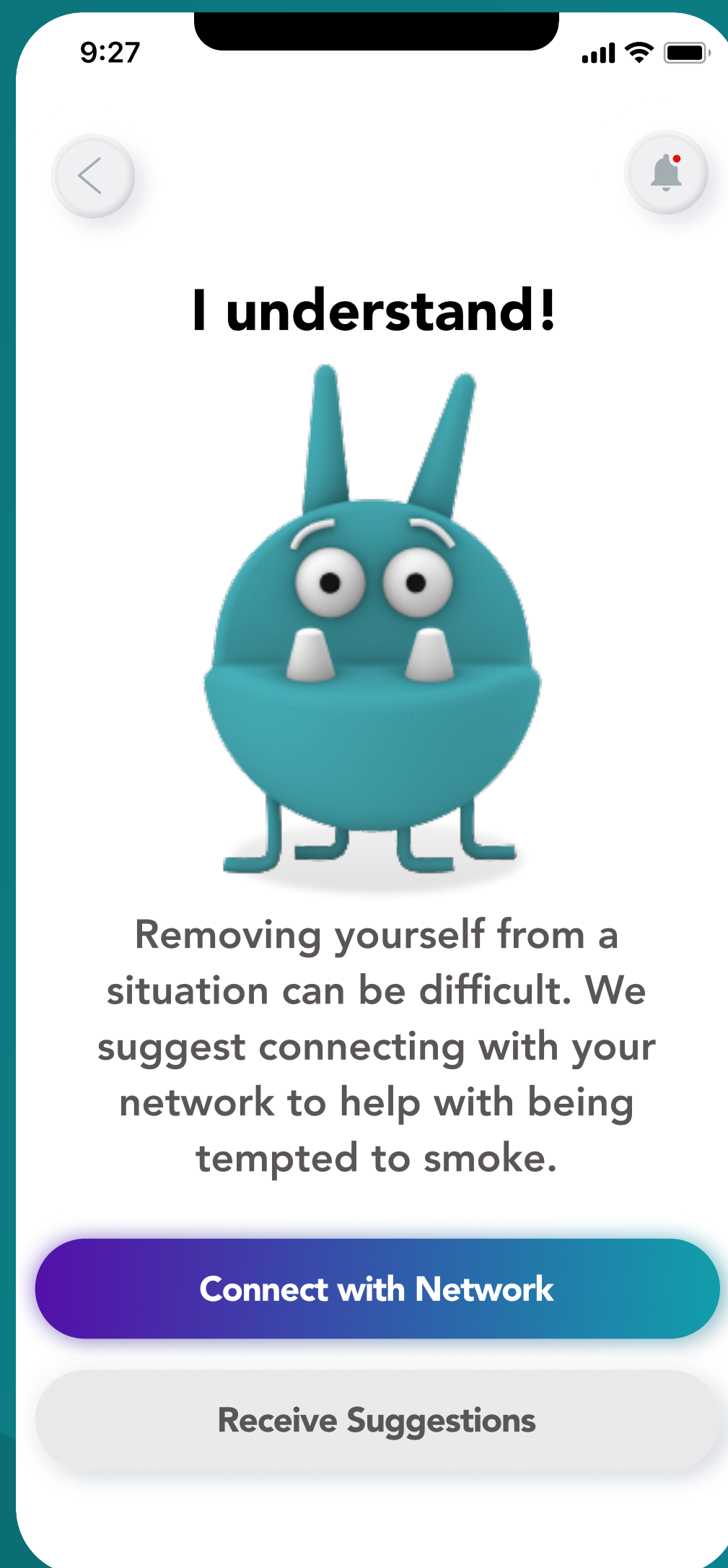


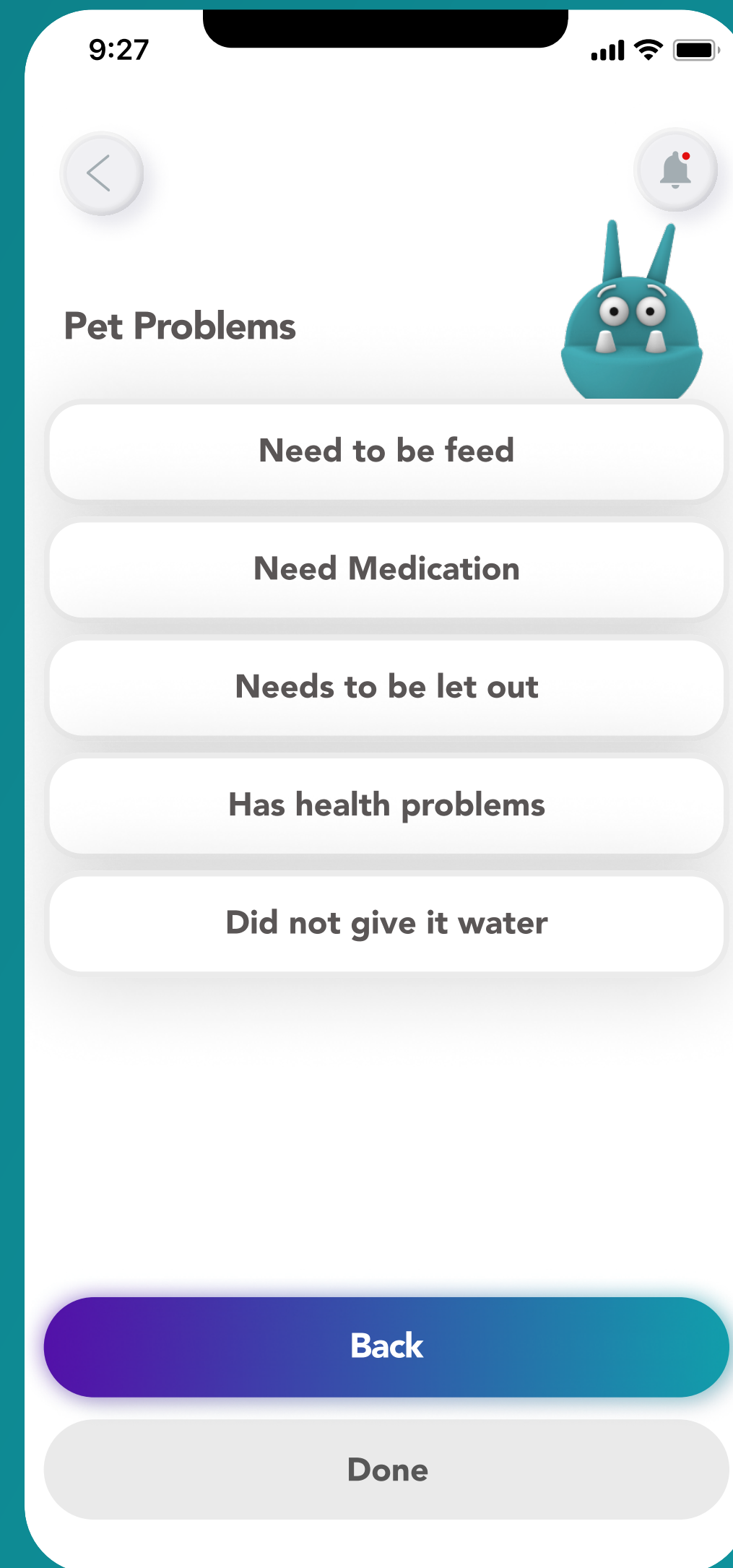
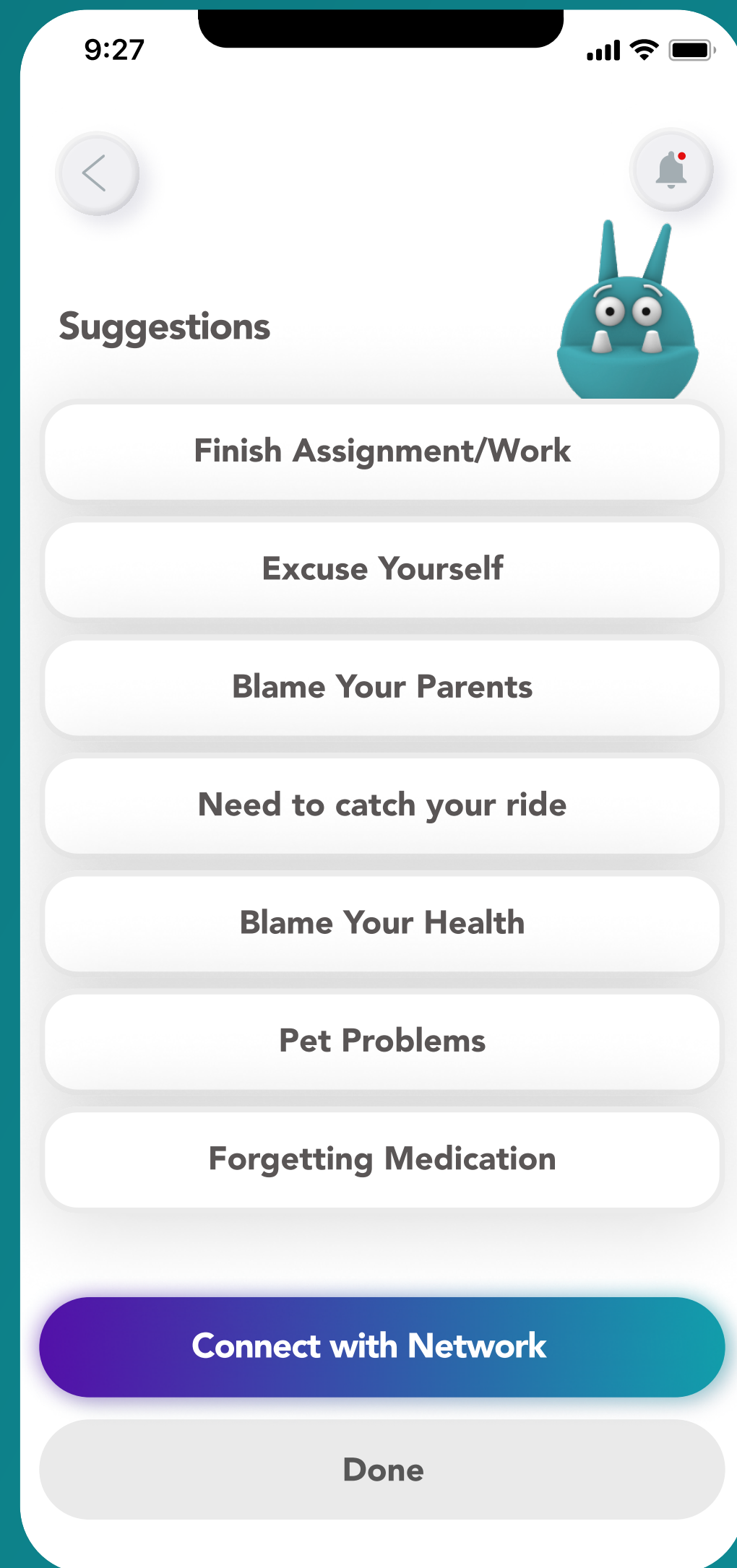
Scenerio 2. Smoke Sensor

If the wearable detects smoke through the smoke sensor component you will receive a pin notification to open your app and review it if it was you smoking or someone in your surroundings. If you state that you are the one smoking then you will be asked if it is due to facing a trigger. If yes, the app will prompt you to define which trigger you were faced with. The app will then give you a suggested tools that the user can use in order to help with removing themselves from the situation they are currently facing. They can also simply connect to their network if needed.





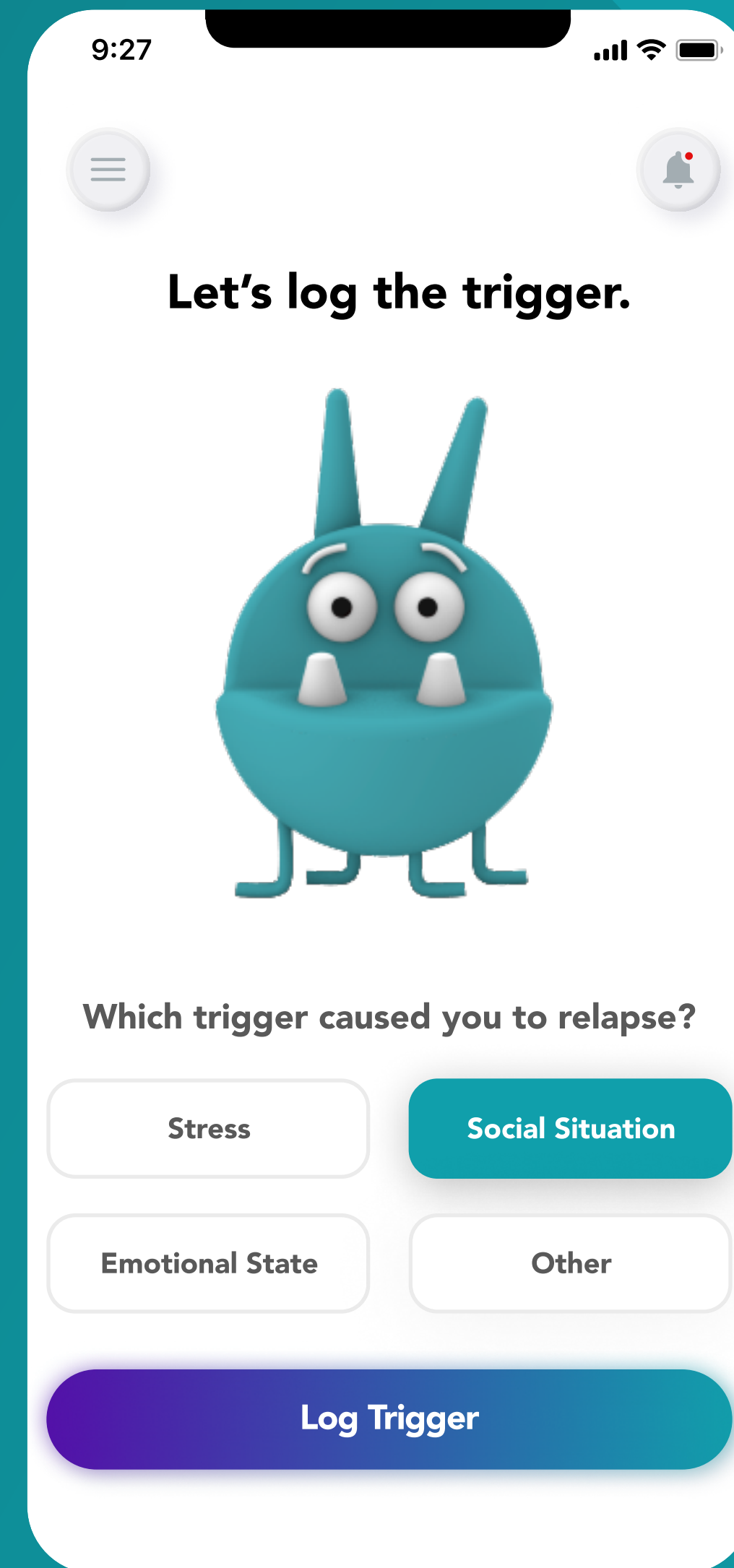
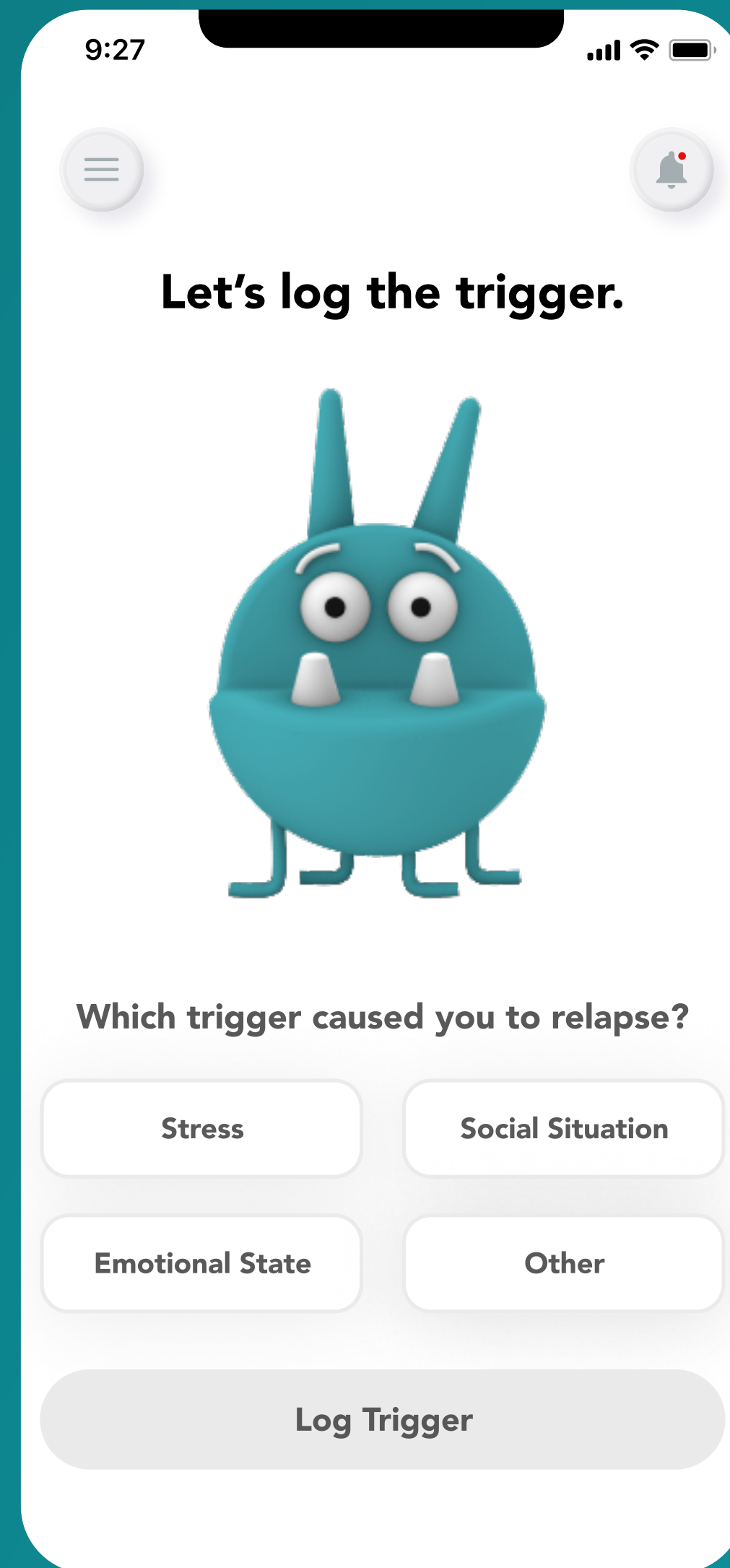
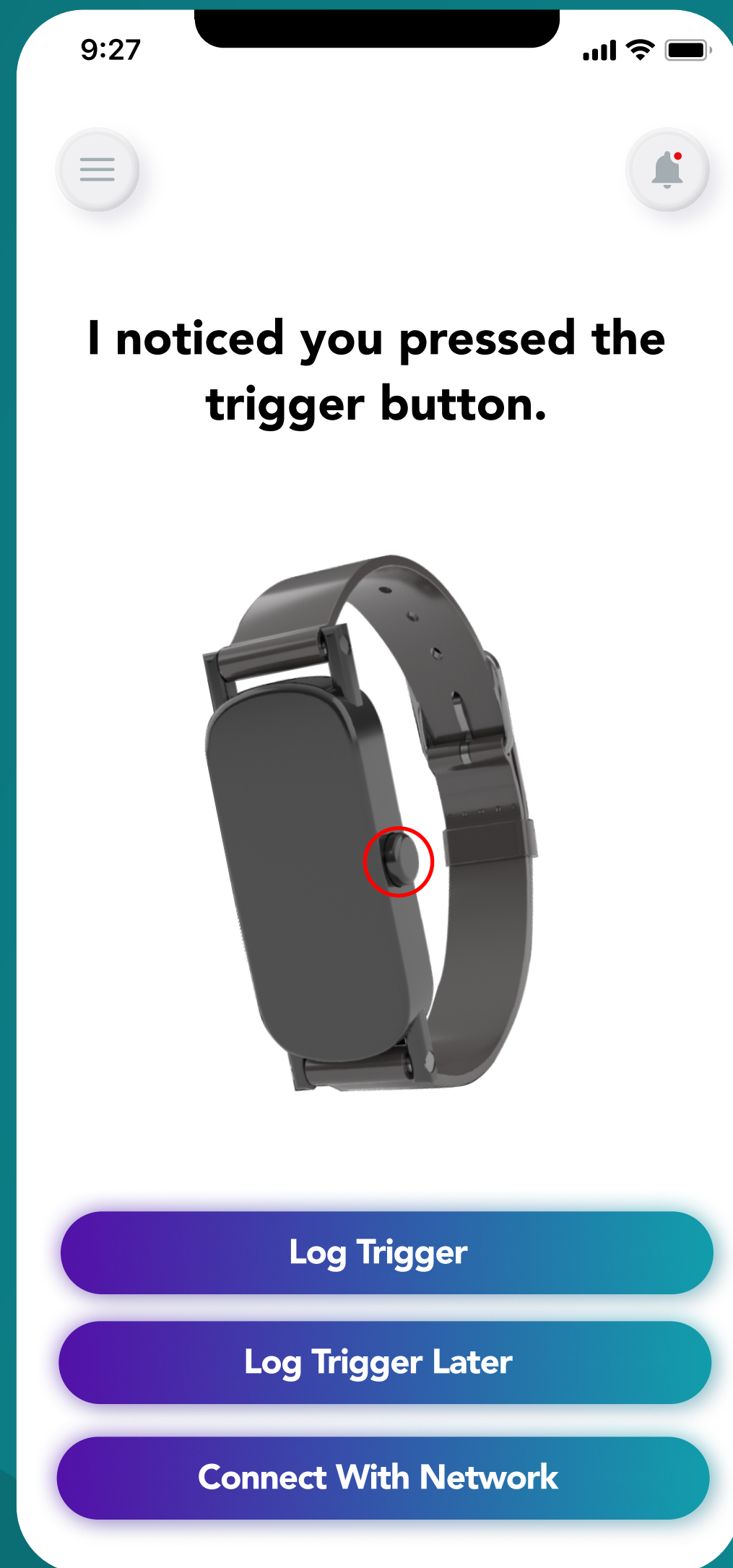






Scenerio 3. Pressed Trigger Button

If the trigger button is pressed on the wearble it will propmt you to asnwer which specific trigger you being faced with. These can be social situations, stress, emotional state, or other if the tirgger is not listed. If it is an inconvient time to log a tirgger the user can log it later where the next time you open the application it will remind you to log it. Similar to the other scenerio's the user will be asked if they want to connect to their network.



Gorb-E Renders

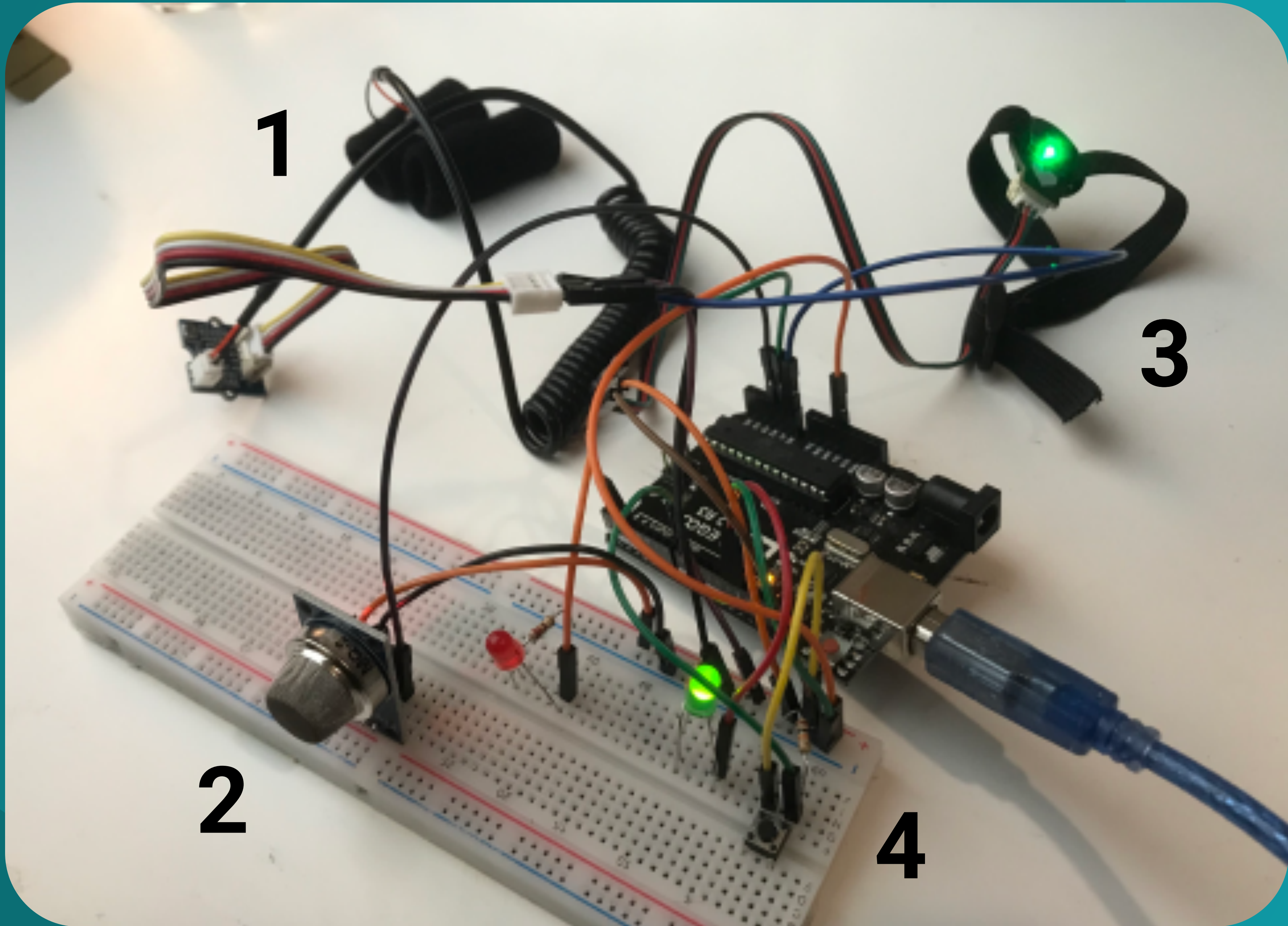






Watch Code & Sensors





1

3

2

4

```
Arduino File Edit Sketch Tools Help
combined_code | Arduino 1.8.13

Auto Format ⌘T
Archive Sketch
Fix Encoding & Reload
Manage Libraries...
Serial Monitor ⌘M
Serial Plotter ⌘L
WiFi101 / WIFININA Firmware Updater
Board: "Arduino Uno"
Port
Get Board Info
Programmer: "AVRISP mkII"
Burn Bootloader

combined_code
#define USE_ARDUINO_INTERRUPTS true
#include <PulseSensorPlayground.h>

// Variables for Smoke sensor
int smokeA0 = A2;
int redLed = 2;
// threshold value
int sensorThres = 400; // Sensitive t

// Variable for GSR sensor
const int GSR = A0;
int sensorValue = 0;
int gsr_average = 0;

// Variables for Heart Sensor
const int PulseWire = 1; // PulseSensor PURPLE WIRE connected to ANALOG PIN 0
const int LED13 = 13; // The on-board Arduino LED, close to PIN 13.
int Threshold = 550; // Determine which Signal to "count as a beat" and which to ignore.
// Use the "Gettting Started Project" to fine-tune Threshold Value beyond default setting.
// Otherwise leave the default "550" value.
PulseSensorPlayground pulseSensor; // Creates an instance of the PulseSensorPlayground object called "pulseSensor"

// Switch button
int switchState = 0;

void setup() {
  // Smoke sensor
  pinMode(smokeA0, INPUT);
  pinMode(redLed, OUTPUT);

  // switch
  pinMode(8, INPUT);

  Serial.begin(9600);
  // Configure the PulseSensor object, by assigning our variables to it.
  pulseSensor.analogInput(PulseWire);
  pulseSensor.blinkOnPulse(LED13); //auto-magically blink Arduino's LED with heartbeat.
  pulseSensor.setThreshold(Threshold);

  // Double-check the "pulseSensor" object was created and "began" seeing a signal.
  if (pulseSensor.begin()) {
    Serial.println("We created a pulseSensor Object !"); //This prints one time at Arduino power-up, or on Arduino reset.
  }
}

void loop() {
  switchState = digitalRead(8);
  if (switchState == HIGH) {
    Serial.println("TRIGGER BUTTON PRESSED");
  }
  else {
    -
  }
}
```

```
Arduino File Edit Sketch Tools Help
combined_code | Arduino 1.8.12

combined_code
pinMode(redLed, OUTPUT);

// switch
pinMode(8, INPUT);

Serial.begin(9600);
// Configure the PulseSensor object, by assigning our variables to it.
pulseSensor.analogInput(PulseWire);
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  switchState = digitalRead(8);
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  else {
  }

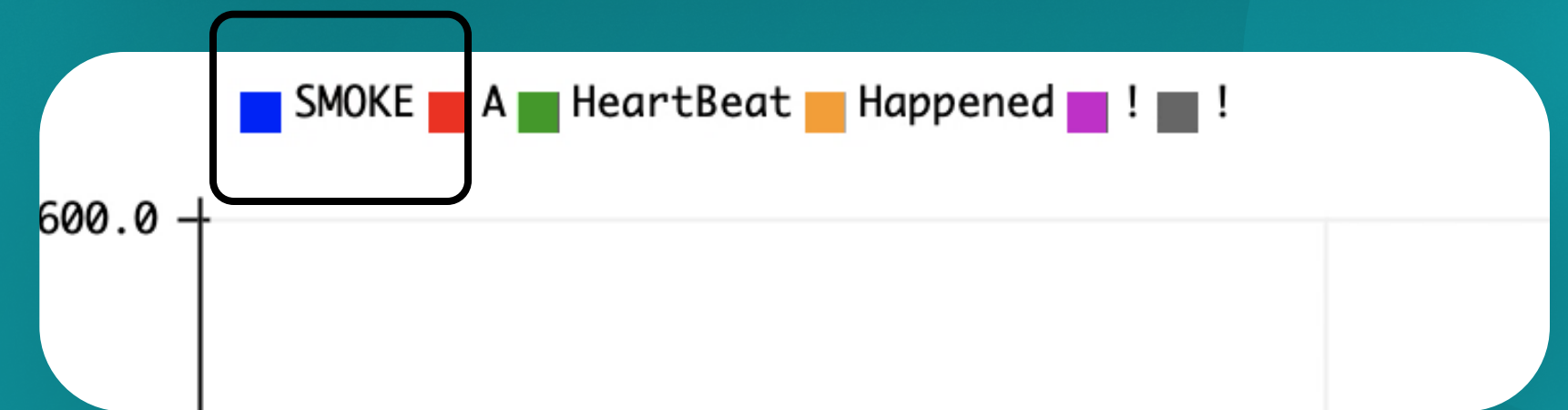
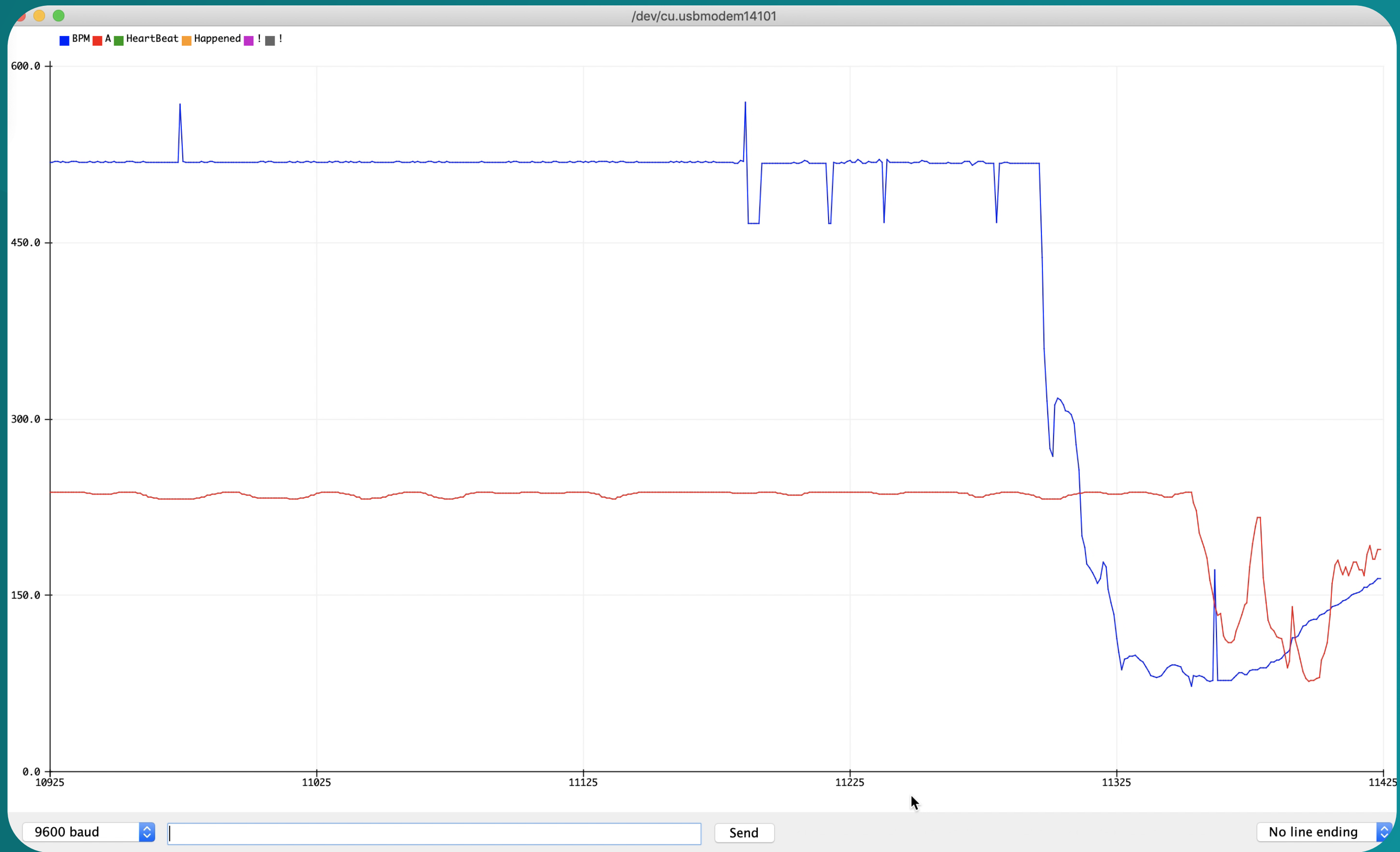
  // For smoke sensor
  int analogSensor = analogRead(smokeA0);

  // Serial.print("Pin A0: ");
  // Serial.println(analogSensor);

  if (analogSensor > sensorThres)
  {
    Serial.println("SMOKE");
    digitalWrite(redLed, HIGH);
  }

  else
  {
    digitalWrite(redLed, LOW);
  }
  delay(100);
}

Done Saving.
Sketch uses 5240 bytes (16%) of program storage space. Maximum is 32256 bytes.
Global variables use 311 bytes (15%) of dynamic memory, leaving 1737 bytes for local variables. Maximum is 2048 bytes.
```




```
▼ A heart beat happened !
BPM: 184
426
▼ A HeartBeat Happened !
BPM: 184
427
426
▼ A HeartBeat Happened !
BPM: 184
425
425
426
▼ A HeartBeat Happened !
BPM: 184
TRIGGER BUTTON PRESSED
425
TRIGGER BUTTON PRESSED
427
TRIGGER BUTTON PRESSED
429
▼ A HeartBeat Happened !
BPM: 191
428
▼ A HeartBeat Happened !
BPM: 191
427
427
▼ A HeartBeat Happened !
BPM: 192
430
▼ A HeartBeat Happened !
BPM: 192
427
428
431
▼ A HeartBeat Happened !
BPM: 179
429
430
▼ A HeartBeat Happened !
BPM: 174
488
429
▼ A HeartBeat Happened !
BPM: 173
TRIGGER BUTTON PRESSED
429
TRIGGER BUTTON PRESSED
```

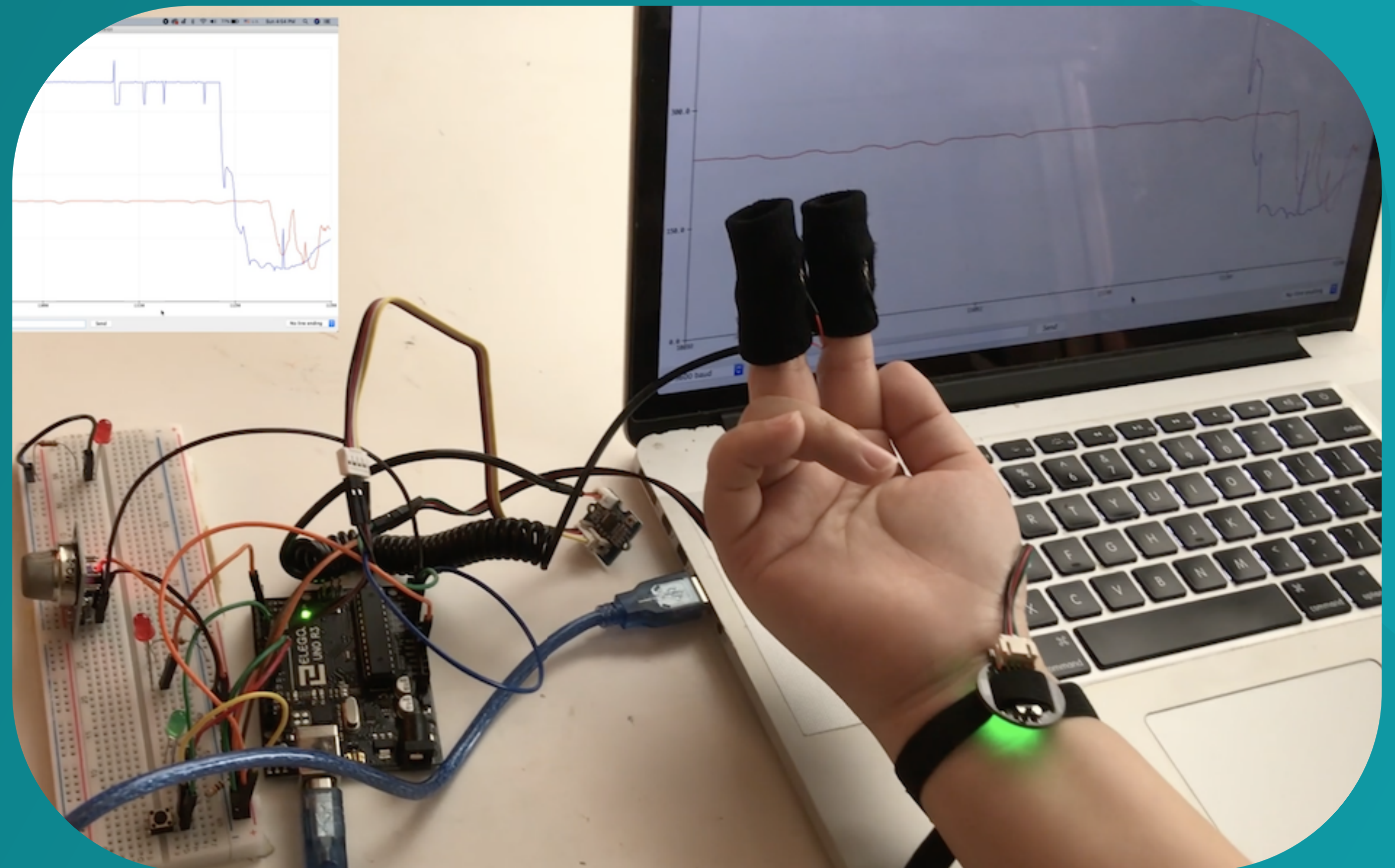
Autoscroll Show timestamp

```
▼ A heart beat happened !
BPM: 184
426
▼ A HeartBeat Happened !
BPM: 184
427
426
▼ A HeartBeat Happened !
BPM: 184
425
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TRIGGER BUTTON PRESSED
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TRIGGER BUTTON PRESSED
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TRIGGER BUTTON PRESSED
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BPM: 191
428
▼ A HeartBeat Happened !
BPM: 191
427
427
▼ A HeartBeat Happened !
BPM: 192
430
▼ A HeartBeat Happened !
BPM: 192
427
428
431
▼ A HeartBeat Happened !
BPM: 179
429
430
▼ A HeartBeat Happened !
BPM: 174
488
429
▼ A HeartBeat Happened !
BPM: 173
TRIGGER BUTTON PRESSED
429
TRIGGER BUTTON PRESSED
```

Autoscroll Show timestamp

No line ending Kill feed Clear output

Watch Video



<https://youtu.be/r656bGdxrto>

Final Deliverables

Vision Video

The image shows a stylized representation of a video player. It features a black rounded rectangular border. Inside, the Gorby logo is displayed in white, consisting of a stylized 'G' followed by the word 'orby'. Below the logo is the tagline 'Curb your cravings.' in a smaller white font. The background of the video player is a teal color with abstract, organic shapes in a slightly darker shade of teal.

Gorby
Curb your cravings.



Gorby

Curb your cravings.

Prototype Video

Link:

<https://drive.google.com/file/d/1NSNTlibPbEGqpe0jrR11NvSl23Oue5Fq/view?usp=sharing>

Figma Prototype Link:

<https://www.figma.com/proto/tCrXZ3u7BSNsemlajLrfyj/Gorby-Prototype?node-id=1%3A386&viewport=1957%2C2566%2C0.3040145933628082&scaling=min-zoom>

Thank you!