

# Nurture

*Helping you nurture your  
long-distance friendships.*

by the **Amazon River Dolphins**

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As people transition away from the places they've lived for a significant period, they leave behind treasured friendships that once brought them significant connection and fulfillment. However, even in today's age of communication, maintaining healthy friendships with people who live too far away to encounter naturally is a monumental task. The Amazon River Dolphins set out to help people struggling with preserving the frequency and quality of communication with their long-distance friends so that they can hold onto the magic that brought them together in the first place. We set out to accomplish this by conducting multiple studies, implementing design techniques, and applying psychological principles of interpersonal communication. This report outlines our process from start to end.

## Our Team



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## Problem Space

The realm of long-distance relationships has been the subject of research for decades, with conflicting results on the optimal way of maintaining a friendship that has lost its ability to grow in person. As technology has evolved, researchers have developed

methods exploring how communication differs across mediums and how different technologies help or hinder long-distance relationship maintenance. Many companies have developed solutions for relationship maintenance in response to a growing count of long-distance friendships. We set out to investigate this research and product space as we narrowed down what our solution would generally look like.

## Literature Review

As we reviewed the existing literature, we explored what long-distance relationships look like across the spectrum, from friendships to romances. Some common threads appeared as we moved through each academic work that pointed us in the general direction of long-distance friendship maintenance strategies. One of the key points that stood out was the **use of asynchronous communication** as a good alternative to phone calls for relational maintenance (Kelpinski, 2019). Still, it falls short when it comes to growing the relationship, in which **phone calls are more beneficial** to developing the connection (Shklovski, 2008). In either case, it's important to note that **technology** (Loburri, 2012) and **emotions** (Octavia et al., 2007) are essential to maintaining relationships with geographic differences.

Interestingly, however, some data supports the notion that **too much information exchange over computer-mediated platforms can damage the relationship** (Stamper, 2019), mainly when the information contains too much day-to-day information (Octavia, 2017).

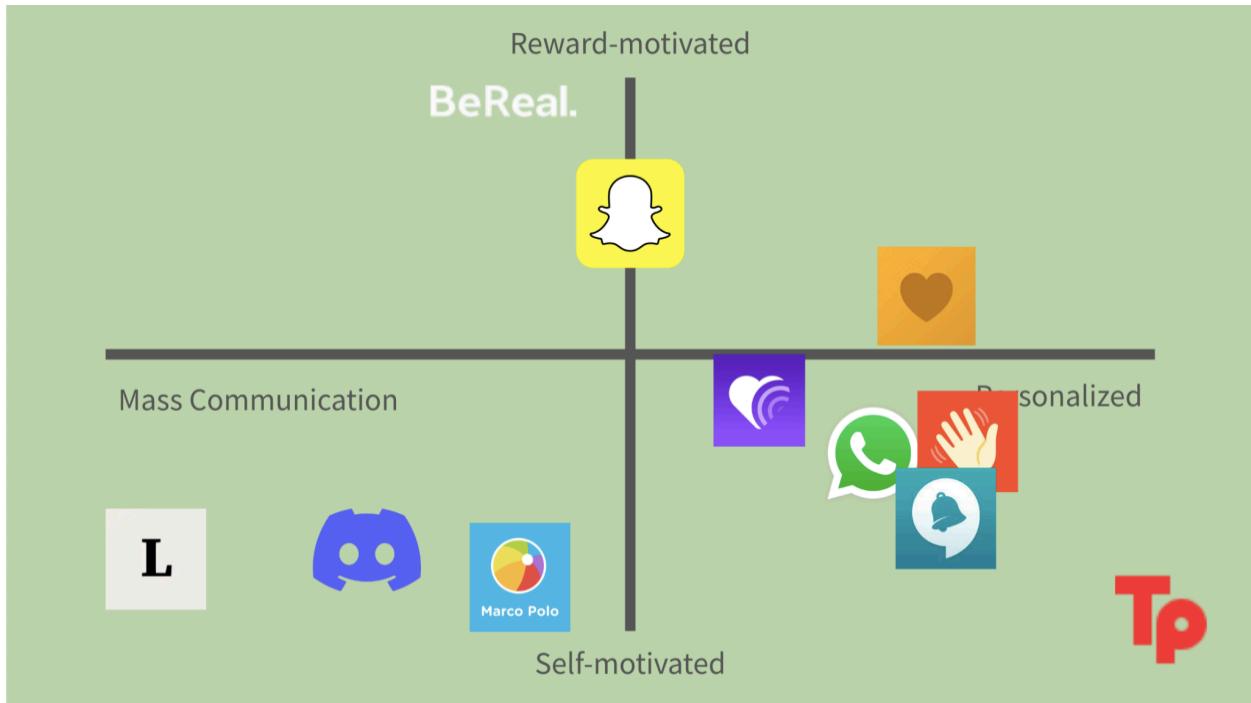
Ultimately, our review of scholarly sources turns up conclusive findings that supported our initial intuition in some respects and surprised us in others. Individuals **value their long-distance friendships**, and **maintaining them is vital** to our social and mental well-being (Pearson, 2022), but overdoing it or maintaining them inefficiently can do more harm to the relationship than good. An important takeaway is that individuals need a way to **communicate their emotions in a way that does not require a significant amount of activation energy** between partners, and

this exchange should be **as synchronous as possible**, even if it is not a verbal exchange. **Emotions also tend to be a key driver of interaction**, with events that have more impact on an individual tending to be the topic of long-distance communication more often.

## Comparative Research

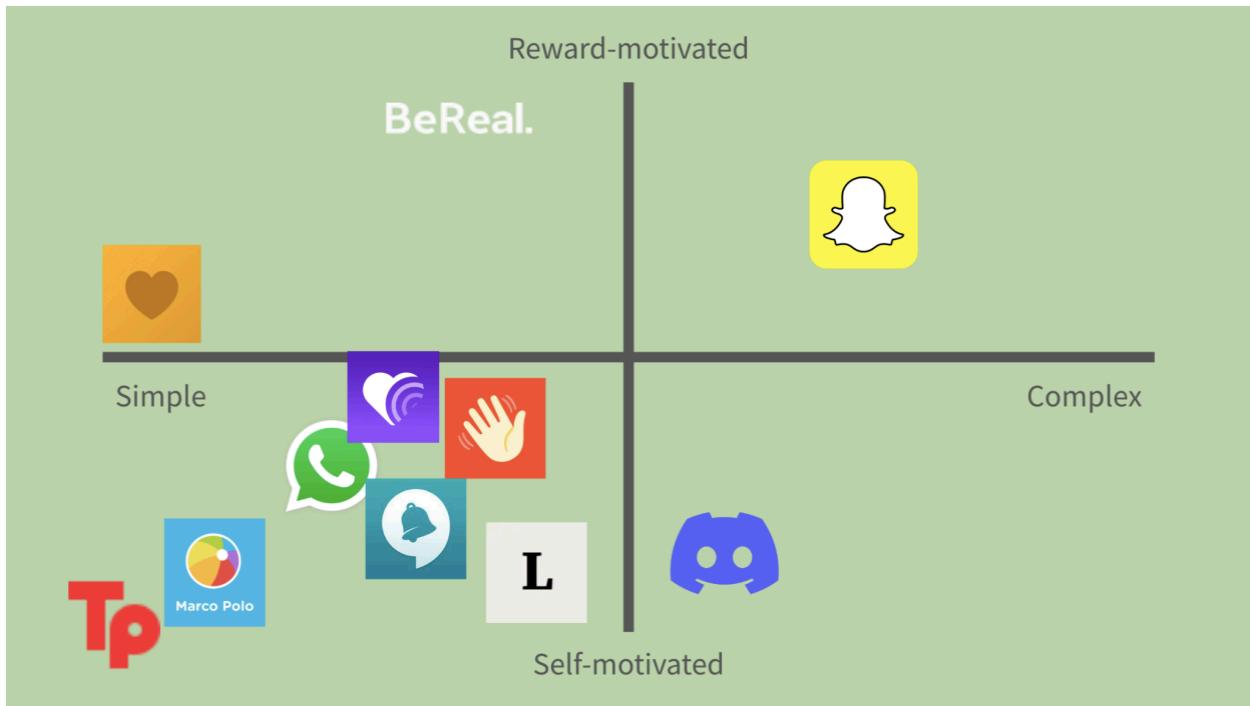
Having reviewed what scholars said about successfully maintaining long-distance relationships, we set out to analyze the existing infrastructure created to help users do that. Through our comparative analysis, we hoped to draw from the success of other products in a similar space to address the barriers that hinder consistent contact while introducing something new within the existing gap of products. We ultimately analyzed 11 products—including mobile apps, web apps, and Chrome extensions—and uncovered insights about their diverse approaches, strengths, and areas for improvement. We then created two separate  $2 \times 2$  maps to visualize gaps in the product space and common trends among platforms.

The first  $2 \times 2$  map compared each relationship maintenance app along the dimensions of **motivation and audience**:



With this map, we noticed that mobile and web applications designed for asynchronous long-distance communication tend to **veer away from mass communication**, where a user posts something to a list of followers instead of sharing it with a specific individual. Because we knew that people have different relationships with different long-distance friends, we wanted to fill the **product gap in the top-right quadrant**, where users can have personalized experiences with varying friends while having some reward-based motivation. This would be best suited to help users who need an additional boost to reach out to friends while maintaining the intimate nature of close friendships.

Our second  $2 \times 2$  map reused the axis of motivation basis, given how **few products seemed to embrace external motivators** to encourage communication. For this one, we compared each app along the dimensions of **motivation and feature complexity**:



After completing our second map, we noticed a cluster of solutions in the **bottom-left quadrant**, highlighting that many apps simply have one or two communication methods with friends and family. Knowing that we wanted to avoid complexity in our app, we sought to pursue what made the apps in the bottom-left quadrant successful while filling the gap in the quadrant above it, namely **the intersection of reward motivation and simplicity**.

Through our comparative research, we found an impressive **gap in the market for a relationship maintenance application that is explicitly motivated by external rewards that are simple and direct in its form of communication**. We were therefore excited to fill this gap with our long-distance friendship app that **encourages users to keep in touch with their friends by using behavior-change strategies** that externally motivate individuals to reach out to those they care about.

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## Baseline Study

### Overview

After investigating our problem space and finding the direction we wanted to take our solution, we designed a baseline study to tell us what our target audience looked like. Our goal was to develop a strong representation of what our potential users, their motivations, and their struggles would look like.

### *Target Audience*

Our target user base for this project was individuals looking to improve the quality of their relationships with long-distance friends. Logically, we chose to observe individuals who self-reported that they desired to enhance their communication with geographically distant friends on our [screener form](#).

### *Baseline Study Procedure*

To get an accurate look at our target audience, we conducted a diary study, where participants would self-report their interactions with their long-distance friends and how they felt after them. For five days, participants in the survey would receive a daily notification about completing a questionnaire consisting of several questions that sought to gauge the **frequency** of their long-distance interactions, the **quality** of the conversations, and the **emotional response** associated with talking to their distant friends. The participants would also be questioned about their habits and experiences in two interviews, one preceding the study and another just after its conclusion. The key questions ultimately answered by the daily surveys fell along two key dimensions:

### Feelings

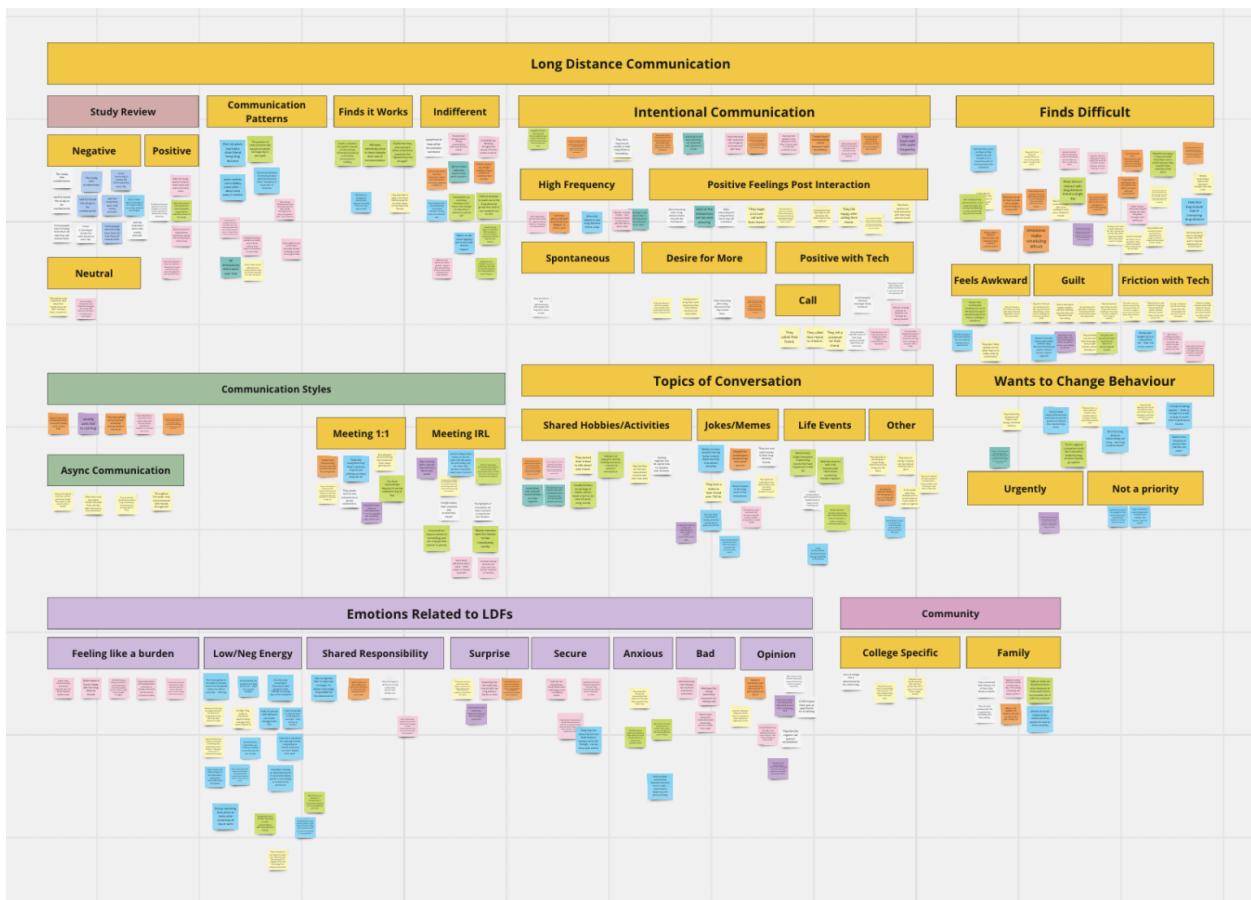
- What do they feel is lacking from the current friendships?
- How do they feel about current methods/solutions available to them?
- Why do they feel this way?

## Actions

- What have they done to try and remedy the situation?
- What do they use to communicate with their friends?
- How often do they keep in contact with their long-distance friends?

## Synthesis

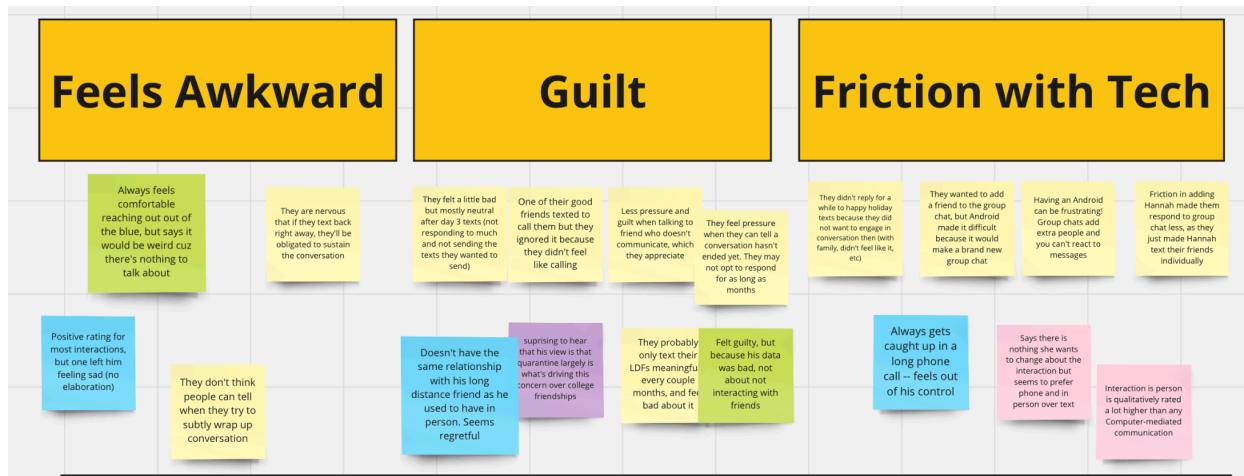
Once our study had concluded, we recorded our insights on a map of sticky notes, which we used to identify some key patterns and trends for our solution, pictured below:



### *Grounded Theory*

From our interviews and diary study, we began crafting the grounded theories that would serve as the foundation for our solution. An important trend from our research was that individuals continuously expressed a desire to improve the frequency of communication with their long-distance friends, where they ultimately varied in their self-reported obstacles to achieving this goal. Our baseline study yielded three major theories for these obstacles that we would explore further in our intervention study.

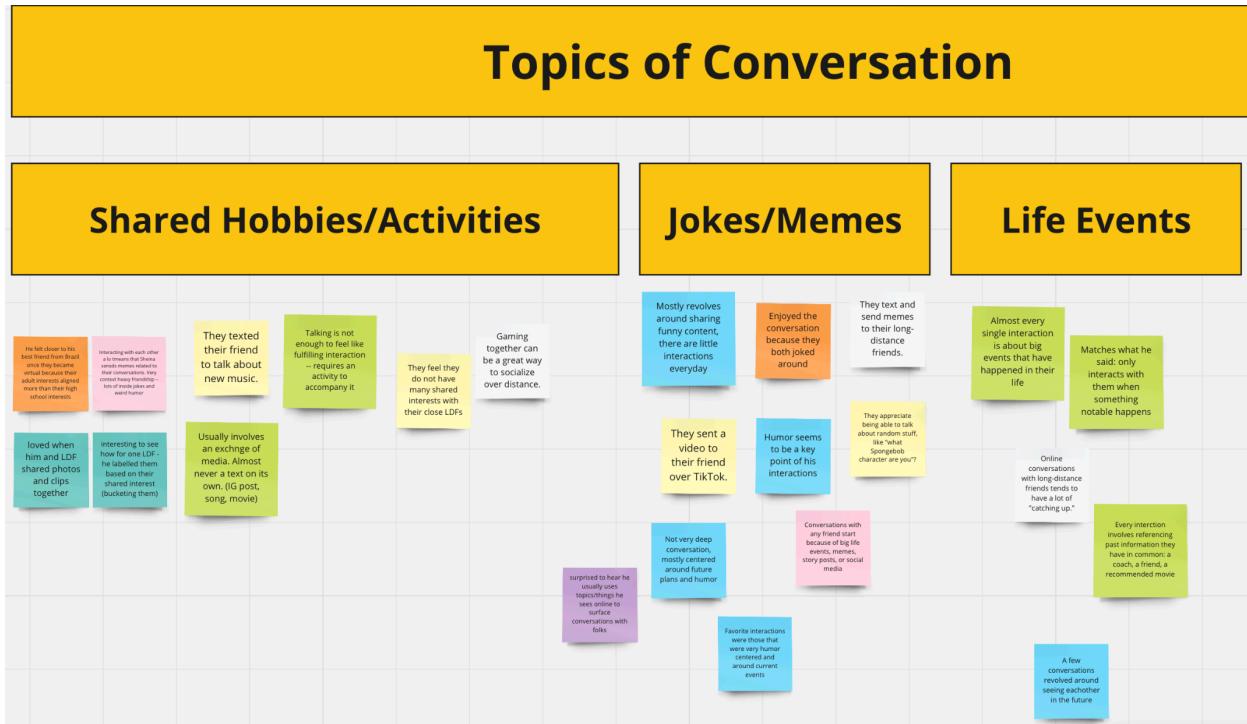
First, reaching out to long-distance friends is frequently referenced as a secondary task regarded as non-urgent by the study participants. This lack of urgency stems mainly from the **asynchronous nature** of the communication and a **lack of external and internal accountability**. Because of the natural urgency of work, school, and local social life, messaging or calling long-distance friends can become secondary tasks to be completed after responsibilities with immediate consequences. We found a pattern of participants who self-reported having **hectic lives reporting a lack of communication** between them and the geographically distant friends they want to maintain. Over time, as long-distance friendships are not prioritized, reaching out becomes a more monumental task as both participants must break the ice and re-establish common ground. This lack of urgency ultimately results in a deprioritized friendship that feeds a cycle of delays and a **steep reduction in communication frequency**.



Alternatively, participants who did seek to prioritize their relationships encountered the opposite challenge. Despite their prioritization of communicating with long-distance friends, participants were still unable to satisfy their expectations surrounding communication frequency. This ultimately led to self-reported feelings of **guilt and shame** for failing to nurture their long-distance friendships effectively. This **sense of responsibility** for the health of their long-distance friendship fundamentally motivates them to reach out in the first place. Still, when they fail to reach out, **avoidance behaviors** ensue, where the lack of communication creates a perception of failure that the participant does not want to engage with. As a result, they fall into a **cycle of guilt** over failing to reach out, **increasing the energy** required to contact them later, and ultimately failing to initiate a conversation.

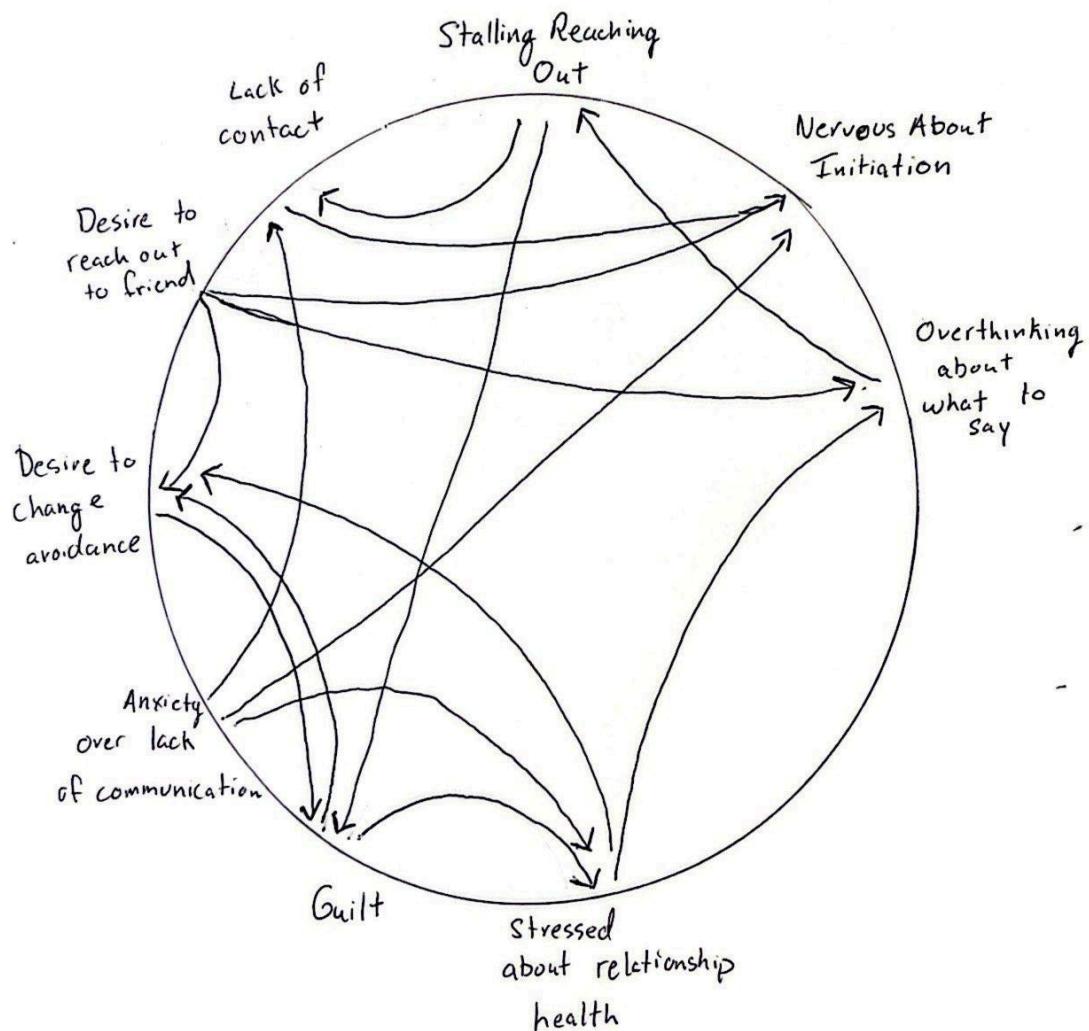
Finally, a key finding was that participants tended to need **justification** for reaching out to a long-distance friend when they felt like reaching out without a reason beyond simply communicating. Several individuals reported that the daily nature of the **diary study was unrealistic** because they would have nothing to talk about with their friends if they communicated too frequently. A common workaround we saw with a few participants was maintaining a single text conversation spread across several days. Participants almost ubiquitously reported breaking the ice **using short-form video content and memes**, finding that simply asking “How are you?” was **too open-ended** and rarely resulted in meaningful interactions. Events that resulted in a

large emotional response, like something very exciting or upsetting, also worked as an excuse to reach out naturally. Opening with a justification for contact resulted in higher reported enjoyment of the interaction and greater fulfillment in the friendship.



### System Models

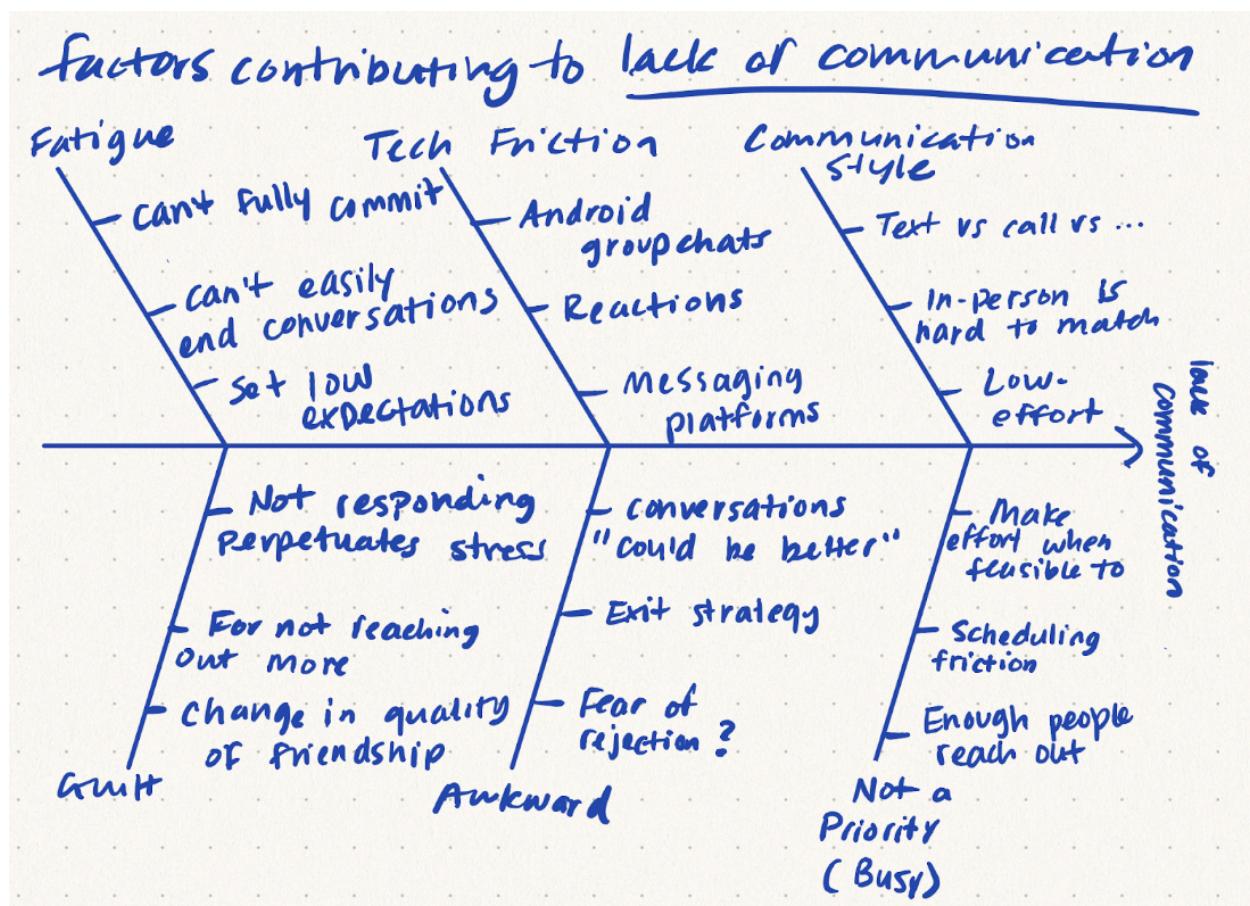
To visualize the emotional cycles that took place in the mind of a user who wants to reach out to long-distance friends but gets caught in the aforementioned cycle of guilt and awkwardness, we created a connection circle, pictured below:



As evidenced by the circle, a cycle becomes evident as one negative emotion easily feeds into the development of another. Despite beginning with a simple desire to interact with long-distance friends, we saw that the anxiety about reaching out led to stress about the health of the relationship. This stress potentially drove long-distance friends further apart, a process exacerbated by the anxiety over the lack of communication in the first place. These negative thought cycles naturally led to the participant exhibiting **avoidance behaviors** that caused them to stall for a while before finding an excuse to reach out. A key pain point to address in this connection circle was finding a way to **break the cycle of negative emotion** by **decreasing the uncertainty** about the relationship's health. With this approach, the **cycle of**

**overthinking and guilt could be bypassed entirely**, leading to a direct connection between a desire to reach out and doing it.

More than just identifying cycles, however, was needed since our goal was to determine the root cause of long-distance deterioration so that we could appropriately tackle it with our intervention. We decided to follow the connection circle with a fishbone model, which outlined the reported causes of participants not initiating contact with their long-distance friends, pictured below:



Once collected in this model, an abundance of causes came to light. Still, we focused on the causes in the bottom half since they were more internal motivations that our intervention could adequately address. After all, fatigue was mainly a product of reports from our introverted candidates, and since our solution would only target one

party of a long-distance friendship, technological friction and differing communication were unrealistic targets for our intervention. The **desire for less awkward conversations** stood out to us as an avenue to **reduce the overall friction that came with reaching out** in the first place, and finding a way to **increase transparency between friends** could help us address the **guilt that was holding back participants** from initiating a conversation in the first place. Our theory that individuals put off interacting with their distant friends because they **choose not to prioritize it** would also be a future target for our intervention.

### *Proto-personas*

Using the data from our study, the grounded theory, and the system models, we developed three proto-personas that would serve as our sample users while we explored the next steps of our solution design.

Busy Bessie represents participants who felt they could not interact with their long-distance friends because of their busy schedules. This persona is the most susceptible to treating her long-distance relationships with little urgency, allowing them to deteriorate over time because of a lack of communication.



**Busy Bessie**

Graduate with **full-time employment, many hobbies**, and friends from college who moved away after graduating

**Goal**

To reach out to their long-distance friends more often instead of writing it off as a low priority task

**Attempts to Solve**

- Tries to section off time of the day to reach out to long distance friends
- Adds things like “reach out to [long distance friend(s)]” to To Do list
- Relies on texting to be able to maintain conversations asynchronously

**Motivation**

Wants to have a closer relationships with friends who have moved away instead of passively talking to them whenever they get to it

**Tools/Skills**

- Good at answering texts, tries to never leave anyone on read
- Friends who don't mind getting a text later than usual
- Small moments to chat with friends despite work
- Ability to stay on top of their daily messages
- Setting healthy boundaries

**Conflict**

- Feels like they are too busy to dedicate time to online friends
- Sees time speaking to long-distance friends as time better spent getting work done

**Routine/Habits**

- Answers texts as soon as they see them
- Ignores unplanned phone calls out of habit
- Always checks phone at the beginning and end of day
- Never dedicates full attention to a text conversation
- Regularly away from phone when they are socializing or working

**Setting/Environment**

Whenever their workload is lightened

Lazy Louis was created to represent introverted participants who felt that interacting with long-distance friends often consumed too much energy. As a result, this persona values their long-distance friends but needs help overcoming the initial hurdle of reaching out despite multiple energy hurdles.



**Lazy Louis**

Introvert with friends back home who struggles with **chronic low energy levels**

**Goal**

To have more interactions with long-distance friends despite feeling like they don't have the energy to do so

**Motivation**

Never has the energy to interact with long distance friends, but wants to have a close relationship with them because they find it rewarding

**Conflict**

Finds interactions over the phone or through text as especially draining  
Already feels socially drained after normal day

**Setting/Environment**

Whenever they feel particularly energized

**Attempts to Solve**

Tries to force themselves through interactions with friends  
Tries to initiate conversations with memes but quickly loses interest  
Relies on texting to be able to escape the conversation at any time

**Tools/Skills**

Regularly on his phone to unwind, never misses a notification  
Has enough free time to reach out to friends  
Good at maintaining fulfilling conversations whenever they're feeling especially energized  
Friends who are understanding that Louis is an introvert

**Routine/Habits**

Spends a good amount of time on their phone  
Ignores unplanned phone calls  
Prefers to spend free time on their own  
Reports feeling fulfilled after forcing themselves through social interactions

Finally, Emotional Emiko is a collection of the emotional rationale for reducing communication frequency. This persona takes the reasoning for reaching out to friends during emotional moments. It also includes other trends that we encountered in our baseline study, such as participants who only reached out when they had an emotional experience to share.



**Emotional Emiko**

Sensitive undergrad with **mental health issues** and long-distance friends

**Goal**

To have regular interactions with long-distance friends that aren't about negative feelings

**Motivation**

Being a better friend to their long-distance friends by reaching out to them for casual interactions instead of only when they're struggling

**Conflict**

Only reaches out to friends when they're struggling mentally or emotionally  
Shuts out long-distance friends when emotions are uneventful or extreme

**Setting/Environment**

When they're experiencing a high level of emotion

**Attempts to Solve**

Tries to check in with friends spontaneously throughout the day  
Uses phone calls to try to get all their feelings across accurately  
Goes to therapy to manage their own emotions

**Tools/Skills**

Strong texter but stronger on the phone – better at communicating emotion when friends can hear them  
Friends who are empathetic and understanding  
Emotionally intelligent and self aware  
Good listener – empathetic  
Good at enforcing personal boundaries

**Routine/Habits**

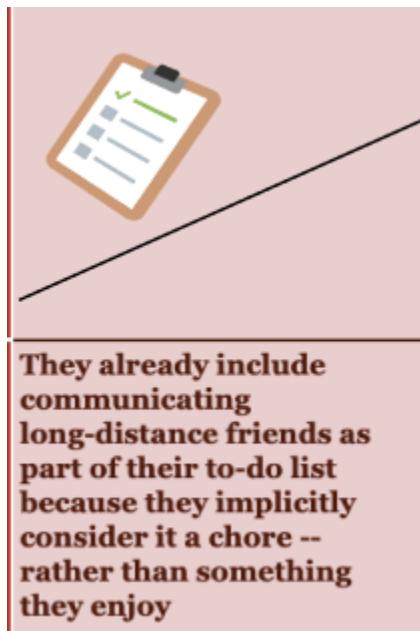
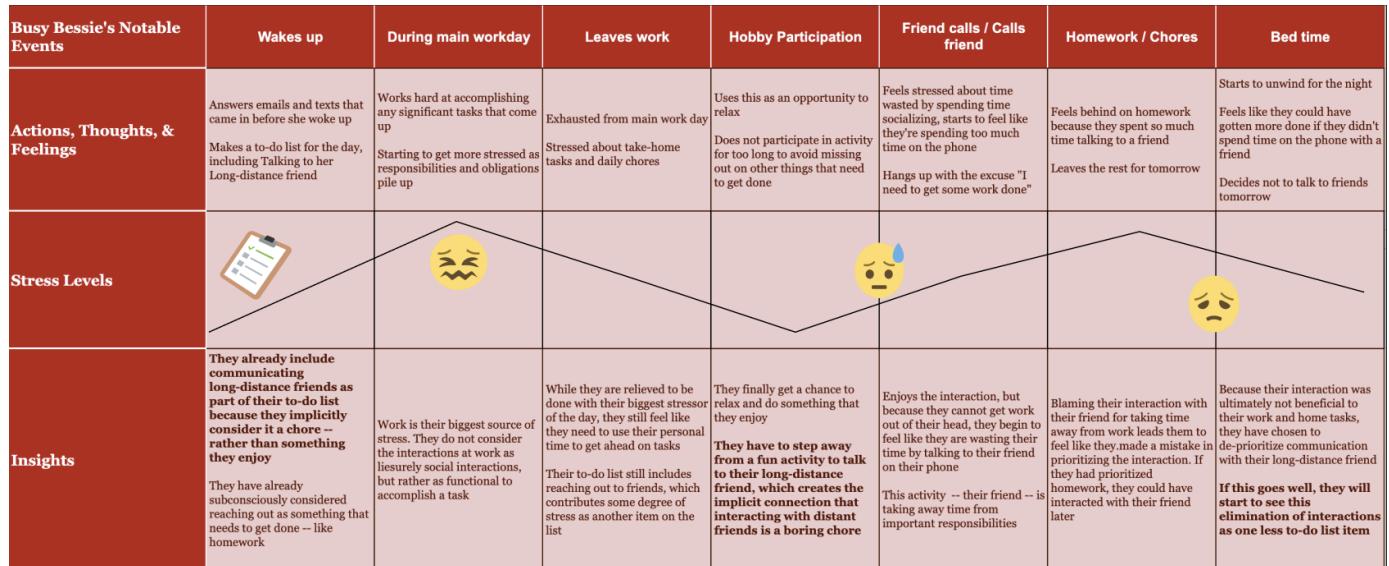
Usually the one that initiates conversations  
Wears heart on their sleeve and will open up quickly  
Is either available 24/7 or doesn't answer anyone depending on mood  
Feels more comfortable being emotionally vulnerable with long-distance friends

## Journey Maps

With our proto-personas defined, we created journey maps for each of them, where a typical day is outlined, and we found insights about how they would communicate with their long-distance friends daily. With this, we hoped to outline some insights about where our potential users struggle and excel with maintaining their long-distance friendships. [You can find all three journey maps here.](#)

### Busy Bessie

Busy Bessie's journey map tracks her stress levels as she moves through the average workday. Below is an image of the full map:



In this journey map, we can identify the issue of **non-urgency**. Bessie's attempts to communicate with friends begin to fall short in the close connection between maintaining long-distance friendships and other stressful tasks, like work. For Bessie specifically, we would want to find a way to help her **decouple interacting with friends from chores** and other stressful tasks. After all, interacting with friends, near or far, should be relaxing.

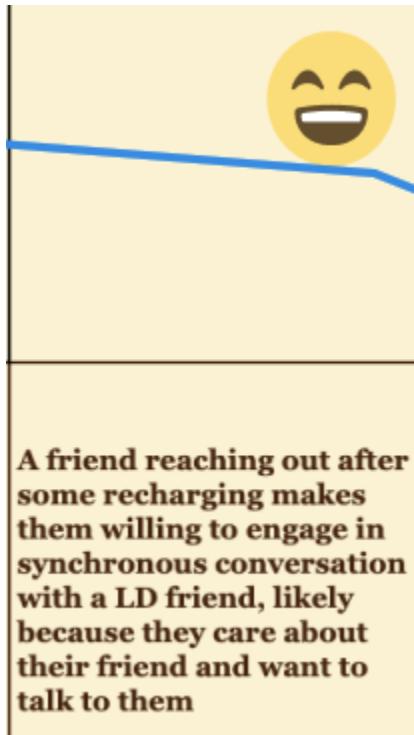
As a result of this stressful connection, users like Bessie would start **de-prioritizing their long-distance friendships**, as maintaining them increases stress levels by pulling them away from work. With our intervention, we want to give Bessie an activity that helps her **reframe her interactions** with long-distance friends as **fun and relaxing** – essentially, an activity that **counters the stress of her schedule**, not enhances it.



### Lazy Louis

Lazy Louis' journey map follows his social battery as he lives through a typical workday. Below is the full map:

Lazy Louis' Notable Events	Wakes up	During main workday	Leaves work	Solo leisure	Start of phone call with friend	End of phone call	Bed time
<b>Actions, Thoughts, &amp; Feelings</b>	Answers all texts received overnight  Has not interacted with anyone today -- feeling refreshed	Communicates with coworkers and others throughout the day  Starts to feel socially and physically drained	Answers important texts from close friends(long-distance or otherwise) and family  Ignores texts that do not need a response immediately  Does not want to see anyone	Ignores notifications and messages  Focuses on recharging  Desires alone time	Talks to LD friend synchronously after they ask to speak on the phone or agrees to FaceTime to catch up  Happy to be catching up with a close LD friend  Enjoys the interaction at first	Makes up reason for leaving conversation  Feels like the conversation has gone on for too long  Doesn't know how to leave without being rude	Isolates themselves some more before bed to make up for the time lost on the phone  They are happy to still interact asynchronously as they feel like it
<b>Social Battery for LD Friends</b>							
<b>Insights</b>	Checking their phone in the morning and answering everyone is a habit, and people do not answer immediately; thus, it is not draining.  They feel refreshed because their social battery has had time to recharge overnight, and their interaction is mostly asynchronous	When they are distracted by things in their current environment, long-distance friends do not even come to mind  Their workday uses up much of their social battery, and they don't have many chances to recharge	The busy workday makes them want to retreat to solitude to recharge while trying their best not to neglect people who care about them	They ignore everything because they need time to recharge after their normal working day  They need time to themselves without worrying about social pressures	A friend reaching out after some recharging makes them willing to engage in synchronous conversation with a LD friend, likely because they care about their friend and want to talk to them  They just finished recharging, so they've got some energy left in the tank	The synchronous communication over the phone has drained them, but they feel trapped in a bad situation with someone they do not want to disappoint  They no longer want to interact with their friend because they are drained, not because they don't care	They now have time to unwind and recharge without any expectation of response  This lack of expectations almost makes them more willing to engage with friends who have sent them messages



Lazy Louis and users like him struggle with **low energy levels** because of the high energy demands that come with their lives independent from their interactions with long-distance friends. Importantly, Lazy Louis **enjoys interacting with his friends** and gets excited when he can speak with them. However, as the interaction progresses, he starts to get drained and doesn't want to back down to **avoid neglecting his friends**. This ultimately results in **avoidance behaviors** as Louis refuses to engage with long-distance friends to protect his energy levels.

We wanted to **reduce friction** in our intervention to address Louis' struggle to overcome his low energy levels. We know that Louis **cares about his friends** and wants to interact with them, even if he does not always have the energy to do so. As a result, our approach in the intervention study would prioritize **reducing Louis' activation energy** and giving him a **low-cost way of interacting** with those he cares about.

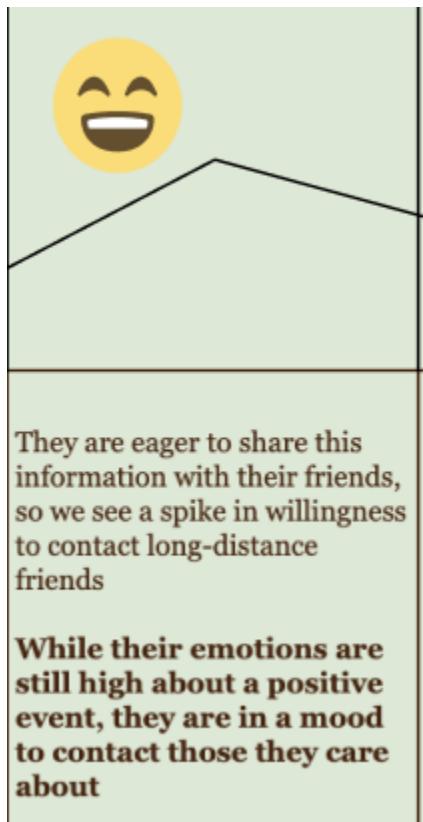


The busy workday makes them want to retreat to solitude to recharge while trying their best not to neglect people who care about them

## Emotional Emiko

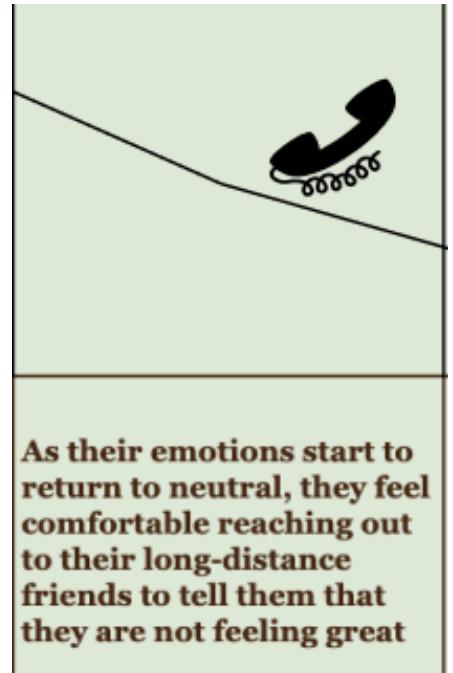
Emotional Emiko's journey map follows an emotional variable day and aims to identify the emotional points of the day that would encourage communication with long-distance friends:

Emotional Emiko's Notable Events	Wakes up	Classes	Exciting Event / Good News	Homework / Hobbies	Mental Health Crisis	Calms down	Bed time
<b>Actions, Thoughts, &amp; Feelings</b>	Feels refreshed, jumps right into the day  Doesn't have much on their mind beyond getting out of bed and getting started with today's tasks	Gets through classes, focuses on work for the day, and answers texts passively as they come in	Excited about an event for the day, wants to share it with the people they are close to  Contacts friends, and long-distance friends, to tell them what they are excited about	Goes back to work as the excitement of the earlier event fades  They are more relaxed, and can go back to focusing on things they have to get done	Experiences a drop in serotonin and begins to suffer from emotional distress  Feels like they don't want to be a burden, so they shut out everyone instead of asking for help	Starts to come out of their episode, so they feel more comfortable reaching out to friends over what just made them upset  Answers texts and calls that may have come in while they were isolated	Unwinds for the day  Ignores any messages that may have come in while they were getting ready for bed
<b>Emotional Volatility</b>							
<b>Insights</b>	Not much has happened today that would necessitate reaching out to long-distance friends  While the day remains uneventful and emotions remain calm, there is not much to share with people they normally interact with		They are eager to share this information with their friends, so we see a spike in willingness to contact long-distance friends  <b>While their emotions are still high about a positive event, they are in a mood to contact those they care about</b>	Going back to work calms their emotions and, as a result, dampens their willingness to talk to long-distance friends. Once again, there is not much to report	An extreme emotional event feels too serious to bother friends, so they keep it to themselves instead of reaching out for help. If this lasts for more than a few hours, it could go on for days.	<b>As their emotions start to return to neutral, they feel comfortable reaching out to their long-distance friends to tell them that they are not feeling great</b>  Their negative emotions are still there, and they feel relaxed enough to reach out for comfort while self-regulating	Their episode has passed, and they no longer require a space to vent, so they go back to being on their own  Without anything new and exciting to report, they stop interacting with others for the day



Emotional Emiko mainly reaches out to friends when they experience an **emotional event**. Their motivation is driven by sharing their feelings with those they care about, which includes their long-distance friends. This reinforces our grounded theory concept of individuals **requiring justification** to reach out. Importantly, there is **little communication at extremely emotional points**, where they shut everyone out, and calm points, where they feel like they have **nothing to share with friends**. This persona gives us valuable insight for users like Emiko, who enjoy conversing about topics deeper than shallow small talk or pleasantries.

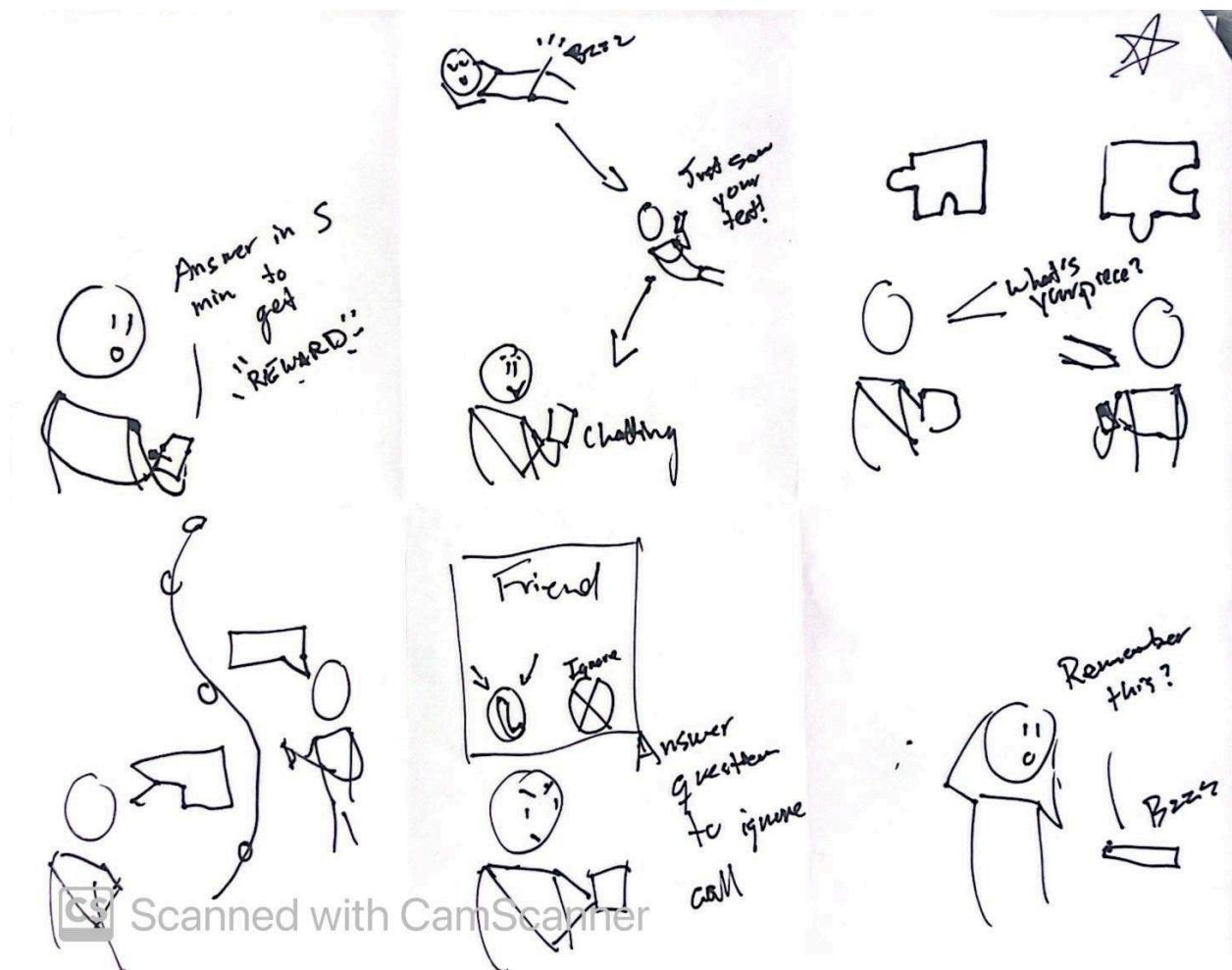
To apply the findings from Emiko's journey map, we would want to find a way to **channel the motivation they feel** whenever they experience an emotional event, positive or negative. Since our goal is to improve the frequency of communication, we can assume that the direction of the emotional magnitude is unimportant, merely using Emiko's propensity to contact those they care about in an emotional state to inform our intervention without going as far as creating extreme emotions. A good approach would be to **trigger recollections of emotional moments**. Our intervention would **heavily center emotions** and **encourage participants to communicate them** to their long-distance friends to benefit our users most.



## Intervention Study

### *Ideation*

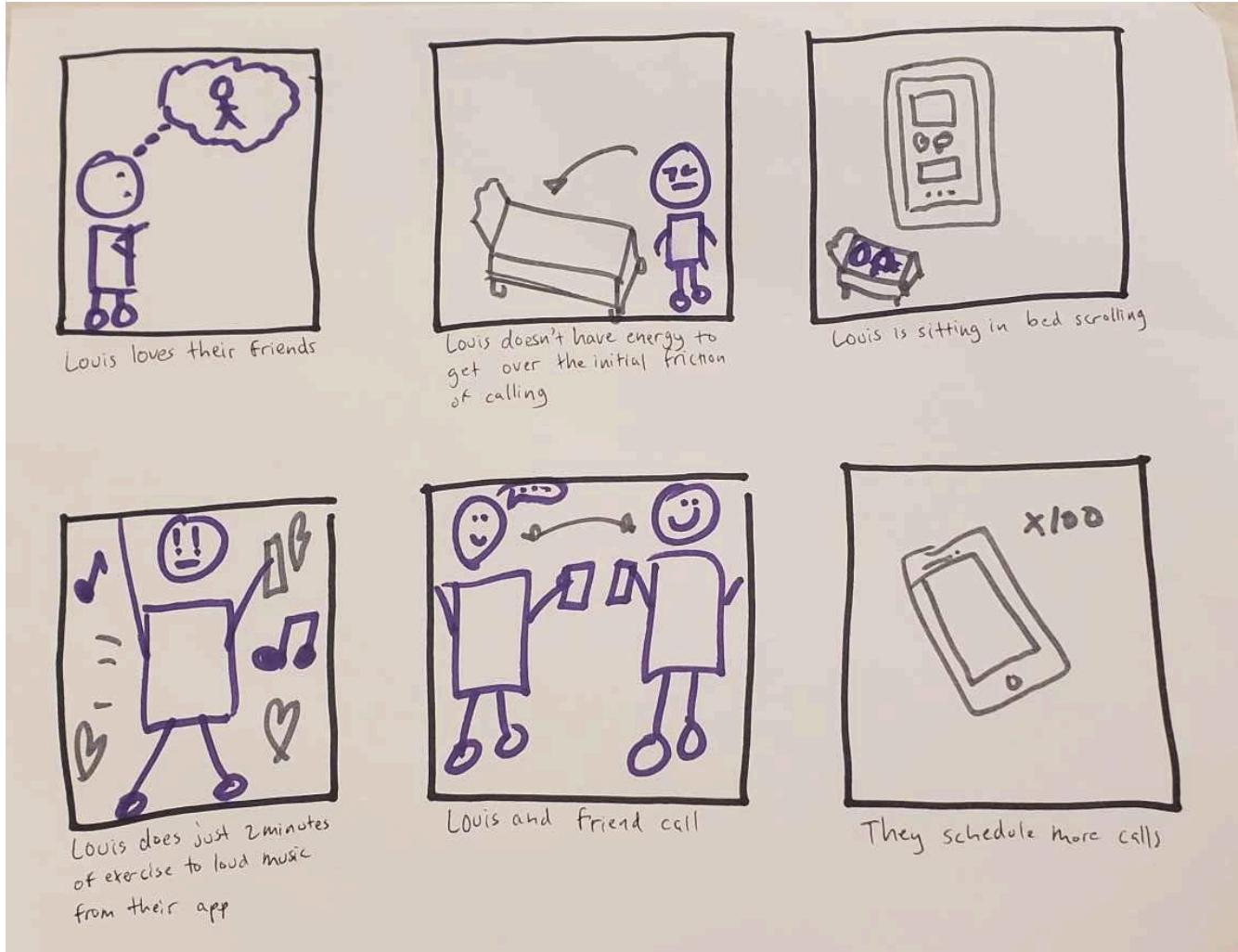
We took the findings from our baseline study analysis and attempted to create interventions to tackle some of the problem points for our proto-personas. The goal was to choose an intervention that targeted the most obvious causes of reduced communication with long-distance friends. We started by sketching out every intervention that came to mind where each square was a different idea in sketch grids that looked like this:



We then threw our favorite potential interventions in a heat map, where each group member got three votes to distribute across their favorite ideas. pictured below:

- Conv. Prompts
    - ↳ Scans messages for content
  - Automated when 2 meet
    - Increase energy @ source (EDM, Exercise) Evan
  - Gamification
    - ↳ Challenges (Daily, weekly)
    - Turn it on time Daniel
    - Feeds unreal messages
  - Huddles (opt into group convs)
  - Emotional Pings
    - Work together → cooperation Francis
    - Make it harder to refuse
-  Scanned with CamScanner

We finally elaborated on some of these ideas with storyboards that illustrated a users' ideal interaction with our solution. As an example, here is one of our storyboards for our intervention that centered high-energy music:



### *The Final Ideas*

Our first intervention was to warm people up to interactions with friends by presenting them with **high-energy music thematically centered around friendship**. The idea would be to present participants with a song at a fixed time each day and let them choose whether to reach out to long-distance friends. As for the pros and cons of this idea:

Pros	Cons
Hugely beneficial to Lazy Louis Simple implementation	Too narrow Depends on participant's music tastes Does not help Emiko or Bessie

Our second intervention idea leveraged **consequences for participants** who ignored their long-distance friends or refused to contact them. Participants would be asked to reach out to their long-distance friends, and if they failed to do so, they would receive punishment in the form of sad imagery or negative evaluation. This method **relies on accountability and loss avoidance** to motivate people to stay in touch with their friends and gives individuals an urgent reason to contact their long-distance friends. Below is a visualization of our evaluation of this idea:

Pros	Cons
Effective on all 3 personas Difficult to implement immediate consequences Loss avoidance is powerful	Too punitive Ruins relaxation or fun goal Questionable long-term effectiveness Ties friendships to stressful consequences

The third idea we chose to pursue involved using a **visual representation of the long-distance relationship** to hold users passively accountable for the health of the friendship. This idea aims to overcome Lazy Louis's activation energy barrier and make reaching out to friends a little more fun for Busy Bessie. The process would still **rely on accountability** in the form of visible **consequences for failures and rewards for success**. The idea mainly aimed to make reaching out to friends more

urgent and break individuals out of avoidance behaviors. The identified pros and cons for this intervention were as follows:

Pros	Cons
Still leverages loss-avoidance	Must choose an accurate visual representation
Makes contacting friendships more urgent	Caring for something could be seen as a chore
Low-pressure reminder of friendship status	
Easy in its implementation	

We chose to proceed with the third idea because of the inclusion of **conversation prompts**. By including prompts given to the participants daily, we were making friendship maintenance **more urgent** and **streamlined** and providing a **justification** for users to reach out, encompassing the core theories we identified following our baseline study. Busy Bessie would ideally be able to interact with a gamified version of her friendship and separate it from work. Lazy Louis would find motivation and energy in caring for a visual representation, and Emotional Emiko would access strong emotional memories to talk about through the conversation prompts. This idea of nurturing a depiction of a long-distance friendship was thus the foundation of our intervention study.

## Procedure

For our intervention study, we visually represented long-distance with flowers that must be nurtured and maintained daily. The participants were a mix of individuals from our baseline study and new participants who had completed the aforementioned screener form. We used live flowers, which each participant named, to create an emotional attachment between them and the depiction of their long-distance relationships.

### *Part 1: Potting & Planting*

The first component of our study involved users interacting with the flowers. After naming the flower, participants would receive daily pictures of their flower in the morning and night, asking them to complete an interaction task by the end of the day. If participants were successful, their flowers would receive water, sunlight, and attention, while participants received praise from their flowery friends. However, if a participant failed the task, the flower would have petals removed to represent their deteriorating long-distance friendships.

### *Part 2: Conversation Prompts*

The second part of our study design required participants to report the answer to one of three conversation prompts about their long-distance friend, which varied between emotional and objective questions. Every morning, participants would receive their daily prompts, an image of the flower, and instructions to choose a prompt and answer it by the end of the day. Their response, or lack thereof, would result in care or harm to their flowery friend, which would then be made available through a picture. For example, if a user had successfully reached out and answered one of the given prompts, they would receive a photo or video of their flower having their water replaced and thriving.

Our goal was ultimately to answer the following key questions:

- How will people be impacted by the visual depiction of their long-distance friendships?
- Will people feel motivated by this depiction?
- Which type of conversation prompt will yield the highest quality conversation?

## Findings and Insights

The intervention study was valuable in helping us develop various insights and new approaches for the next step in our solution design.

### *Part 1A: Potting & Planting Insights*

The response to the flower ranged from apathy to endearment, with some users reporting that they forgot the flower was even a part of the task and others requesting to see their flowers if they didn't receive a picture on a given day. **Those significantly attached to their flower reported higher enjoyment in completing the task.** In contrast, those who did not connect to the flower reported the intervention study as more of a chore.

This variability could result from the medium, given that a flower in a participant's care may have allowed for a greater emotional attachment. Differences in how participants interacted with their flowers could have also contributed to their degree of emotional attachment to a plant they only saw in pictures once or twice a day.

From this, we gather that there's variety in how people interact with a third-party "character" that depends on their actions. While no one was explicitly resentful towards their flower companion, we **generally expected more attachment** from the participants. Those who self-reported a high attachment to their flower reported contacting a friend near midnight so their flower wouldn't be hurt. The **visual reminder was a motivator to reach out to friends through accountability**. In future iterations of intervention studies, we have three ideas to improve the emotional connection between users and their flowers in our solution:

- (1) We would like to **personify the flower further**, using emotional appeals to connect the user to a being rather than an image.
- (2) Flowers could serve as a more direct representation of a relationship by having participants maintain **one flower per long-distance friendship** — if one relationship is maintained, only one flower thrives.

(3) The care of a flower could be **levied upon both parties** in these long-distance friendships, where participation from both parties is required to maintain a single flower. This would encourage participation from both friends while making care of the flower a bonding activity.

### *Part 1B: Potting & Planting Reflection*

Our intervention study concluded with the participant's choice of an interview or Google form, which aimed to investigate why the participants behaved the way they did. Apart from the section-specific insights, we found several takeaways from the intervention study that were worth exploring further.

**None of the participants lied** to protect their flowers from harm. Despite the days when they did not have answers to any of the provided prompts, participants were still honest about their failure despite the harm that would come to their flower. The significance of this fact is twofold. Participants were **willing to approach the study in good faith** to provide positive results for our study, but this also means that **participants were not invested in the well-being of their flower enough to tell a non-falsifiable lie**. It is also uncertain if participants would lie to a digital app over an acquaintance asking them for the truth. To improve this in the future, it might be an interesting approach to give participants a more **explicit option to lie** in the intervention study, perhaps by **making the consequences of failing the task explicit** in the check-in pings, but this may pull the attention away from the friendship aspect of the study, and we would want to **keep lying inaccessible** for the sake of our solution.

### *Part 2A: Conversation Prompt Insights*

We found that users were receptive to the conversation prompts, with some reporting that the prompts were **open-ended enough** to provide an answer without asking their friend anything too specific explicitly. Other users considered the prompts **awkward**, feeling that there were times when they would reach out to their friends only to get an answer to the given question; it is important to note, however, that these prompts did **improve the frequency of communication**, which occasionally led to

a more extended interaction with **positive emotional outcomes**. We found that some participants chose to respond to a prompt about negative emotions (i.e., “What is something your friend is stressed about?”) whenever it was offered. From this and the information we gathered in our literature review, we can tentatively conclude that these decisions to talk to their friends about more negative emotions support the notion that our participants and their friends **preferred conversations with higher emotional valence**.

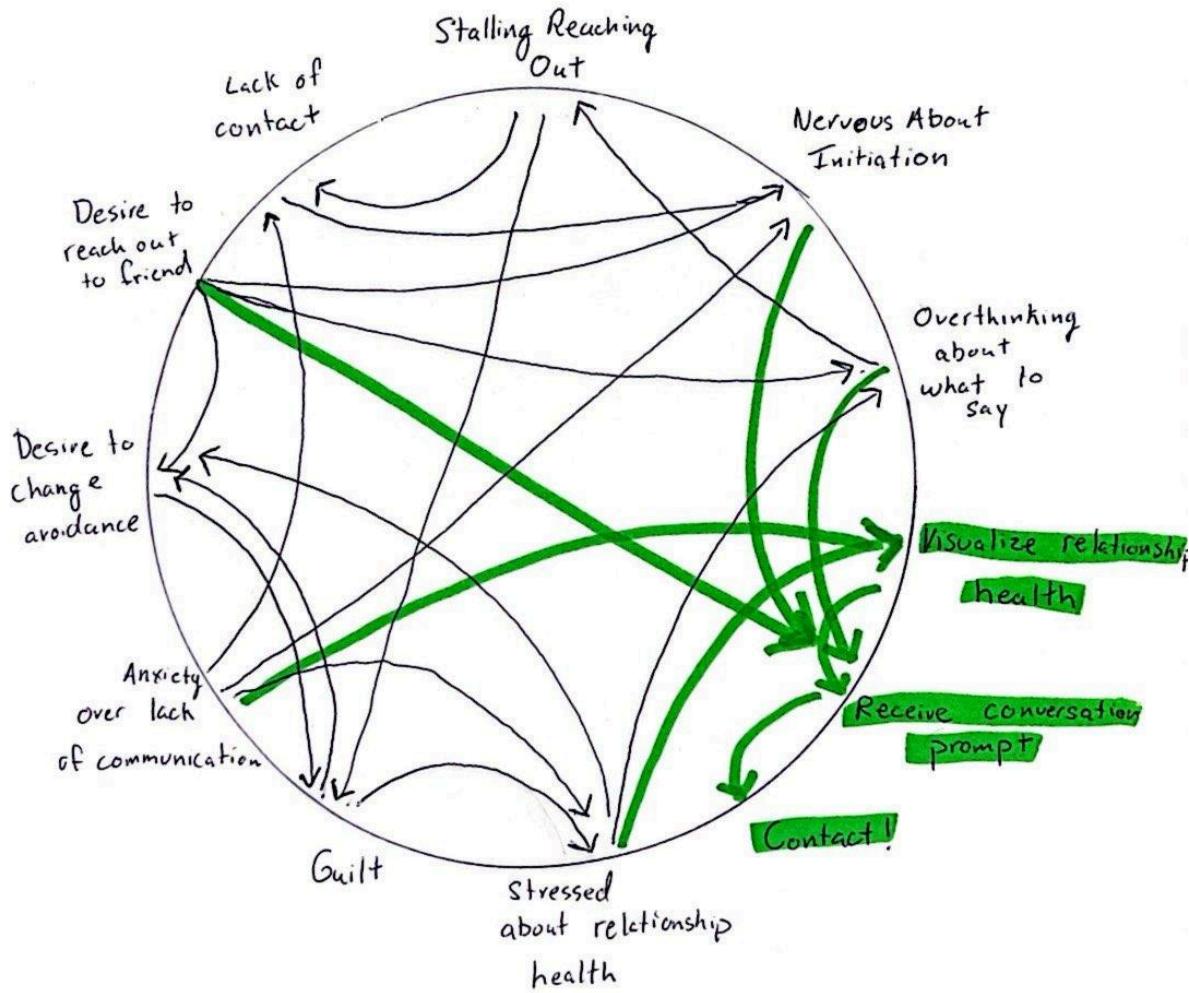
#### *Part 2B: Conversation Prompt Reflection*

We found that it was **rare for the participants to fail their tasks on a given study day**. Most of our sample users seemed committed to at least attempting to receive an answer to one of the prompts daily. However, we cannot assume this is due to the flower’s influence or the efficacy of the prompts. The frequency of communication may have only spiked because they were being **held accountable by another human** being conducting a study. **Subject bias** likely has a strong effect on any study of this nature. To address this in future interactions of this study, it would be more informative to **automate the notification process** as well as the flower maintenance to be more representative of the proposed solution. While technically burdensome, this could be overcome by **simulating automation** with participants who do not know us outside of the study. For our solution, this only **reinforces the previous notion of using flower personification** to make the flower appear more like an individual holding users accountable to leverage the human desire to people-please.

Moreover, a few participants highlighted the **difficulty of reaching out to a friend daily**, with some expressing that having to talk to a long-distance friend on a day-to-day basis was “unrealistic.” For our solution, we propose that users be able to introduce some self-accountability, where they decide **how often they want to communicate** with their long-distance friends. Striking a **balance between encouraging a high frequency of communication and making speaking to friends an unwelcome chore is paramount for our solution, as we may end up introducing more friction to developing a good habit**.

### System Models — Connection Circle Revisited

We revisited the connection circle we created following our baseline study, which primarily depicted the cycle of negative emotions a user would go through before contacting a long-distance friend. With our intervention, we have **introduced multiple escape paths from the original cycle of negative thoughts**. The path our intervention creates is highlighted in green:



With the introduction of the elements of the intervention study, participants can ideally **avoid the guilt and uncertainty** that previously resulted in a lack of communication between long-distance friends.

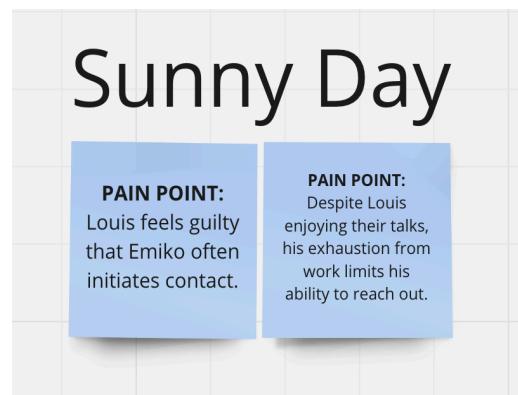
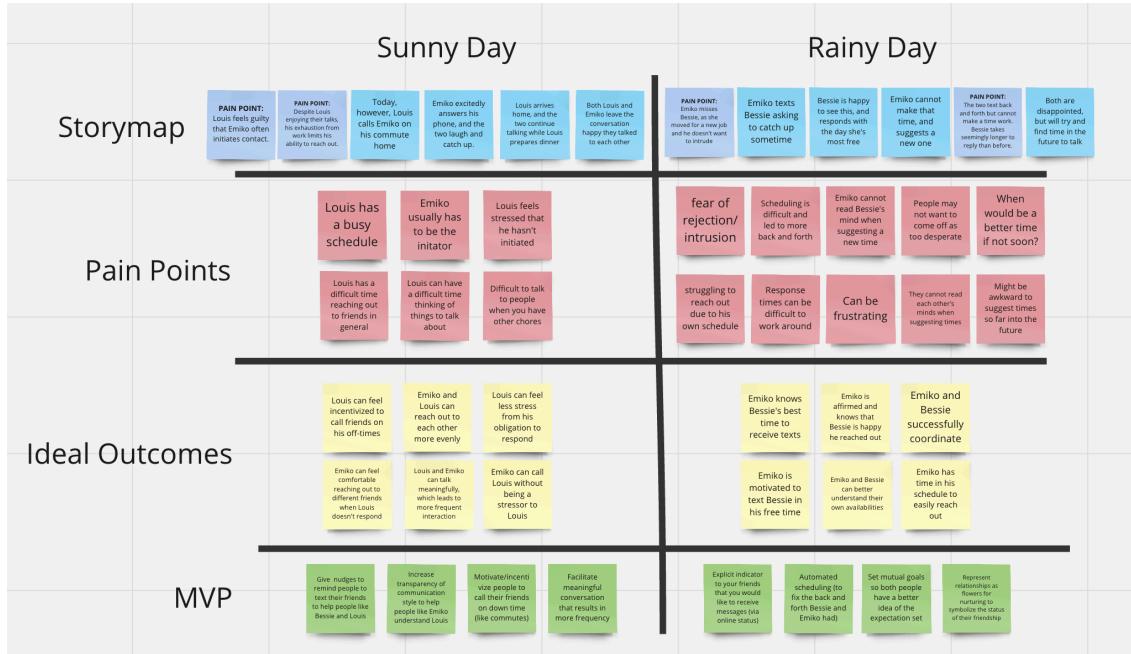
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## Solution Design

### Design Architecture

#### *Story Maps & MVP Features*

We created a story map to convey everyday hardships represented by our participants in our diary study, and our participants are represented through the lens of our proto-personas. To provide a multi-dimensional look at what our participants may encounter as they move through our solution, we placed them in two scenarios: a positive or “sunny day” one and a negative or “rainy day” one. We showcase Lazy Louis and Emotional Emiko in our sunny day scenario. Louis feels guilty for not initiating with Emiko due to his exhaustion and distracted state of mind. In our rainy day scenario, we see Emiko trying to reach out to Busy Bessie despite awareness of her busy schedule. While Bessie responds eagerly, they cannot coordinate a time that works for them. We analyzed further pain points and their ideal outcomes from these scenarios and generated solutions we hoped to incorporate as features in our final product.



In our sunny day scenario, we

discovered a critical pain point felt by people who have difficulty getting the motivation to initiate contact and often even respond to messages. We found that people who face this issue may feel a sense of **guilt** that they cannot reciprocate and feel **stressed** by the fact that they cannot keep up with responding to messages. This stress often perpetuates into **avoidant behavior**. This confirmed our speculation that had developed due to our previous diary studies.

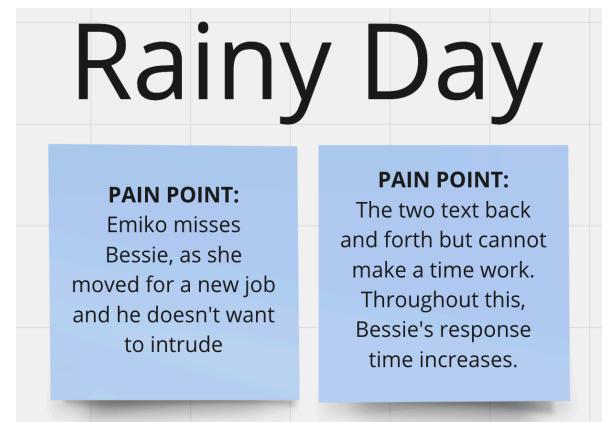
Given this scenario, we tried to identify some of the ideal outcomes that would alleviate some of the hardships faced by these people while also resulting in a scenario where both would be satisfied. Of the different scenarios we came up with, we wanted to focus on the following:

- Louis can feel less guilt around the status of his friendship with Emiko
- Emiko can reach out to Louis without it being an additional stressor for Louis
- Louis can feel motivated in his off-time to contact his friends and be reminded of how much he enjoys talking to them when they can connect.

Based on some of our synthesis in our diary studies, we wanted to focus on an idea that is often overlooked: **everyone has their preferred communication style**, which includes their preference for the modality of communication, how often they want to reach out, the amount of effort they expect to put into a response. We hope that helping people understand each other's communication styles could help significantly ease communication burdens by **helping calibrate expectations**. Thus, we derived the following features from our sunny day scenario to alleviate these pressures.



In our rainy-day scenario, we tackle the common problem of keeping in touch when life gets busy. Emiko wants to reconnect with Bessie before overstepping. Bessie is open but needs help finding a suitable time. This reflects a broader issue: starting conversations, aligning schedules, and feeling let down when it doesn't work out. In many



ways, we found this to parallel the hardships of Lazy Louis in our sunny day scenario.

With this, our goal was to make communication easier and guilt-free. We aspired for our features to accomplish the following:

- Empower Emiko to reach out without worrying about intruding.
- Give Bessie a space to learn to incorporate long-distance connections in her busy life and respond at her own pace.
- Get both of them to acknowledge each other's preferred ways of communicating and the realities of their schedules.

Emiko and Bessie should know that a **delayed response isn't a sign of disinterest** but rather a reflection of their busy schedules or their current hardships. Understanding this can **remove the stress and guilt** often associated with communication, making the times they do catch up more enjoyable and relaxed. Moreover, we also wanted to **increase the frequency at which they communicate**, and hoped to do this by **alleviating some of the hardships around scheduling**. Therefore, from our rainy day scenario, we derived the following features to complement the set of features we created from our sunny day scenario:



### *MVP Features*

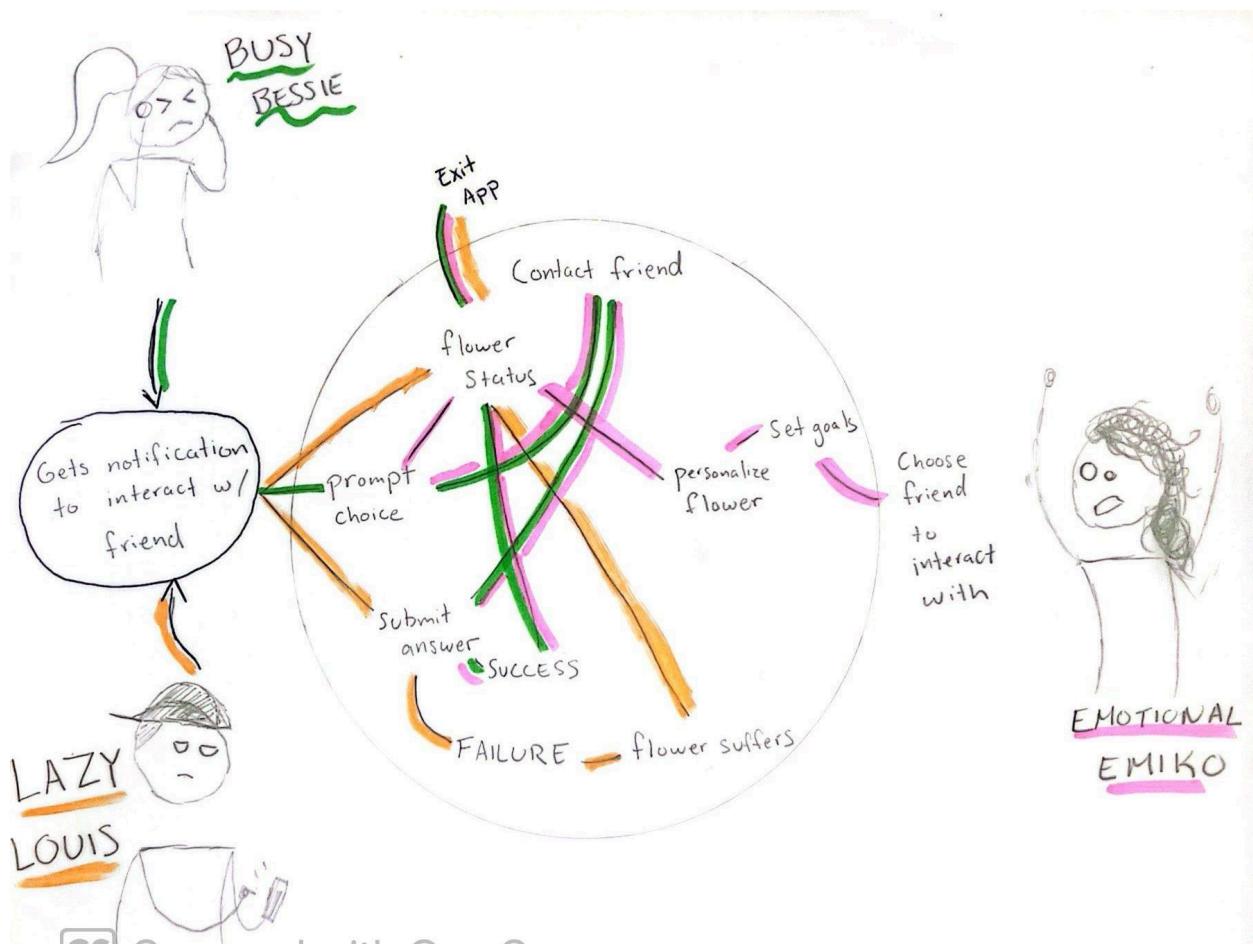
Our final collection of MVP features after both scenarios was the following:

- **Reminders** for people to "nurture" their friendships
- Automated **scheduling**

- Mutual **goals** so both people have a better idea of the expectations set
- **Represent relationships as flowers** for nurturing to symbolize the status of their friendship
- **Indicator** to friends that one would like to receive messages (via **online status**)
- Let people **set and display** their desired **communication style**
- **Motivate people** to call their friends when they have a chance

### *System Path*

Our system path details the journey users would take through our solution design. In the system below, each user's path is made evident by the color of their name and the lines connected to them. In this case, Lazy Louis failed to nurture the friendship to depict the path, but our solution does lay the building blocks for him to succeed.



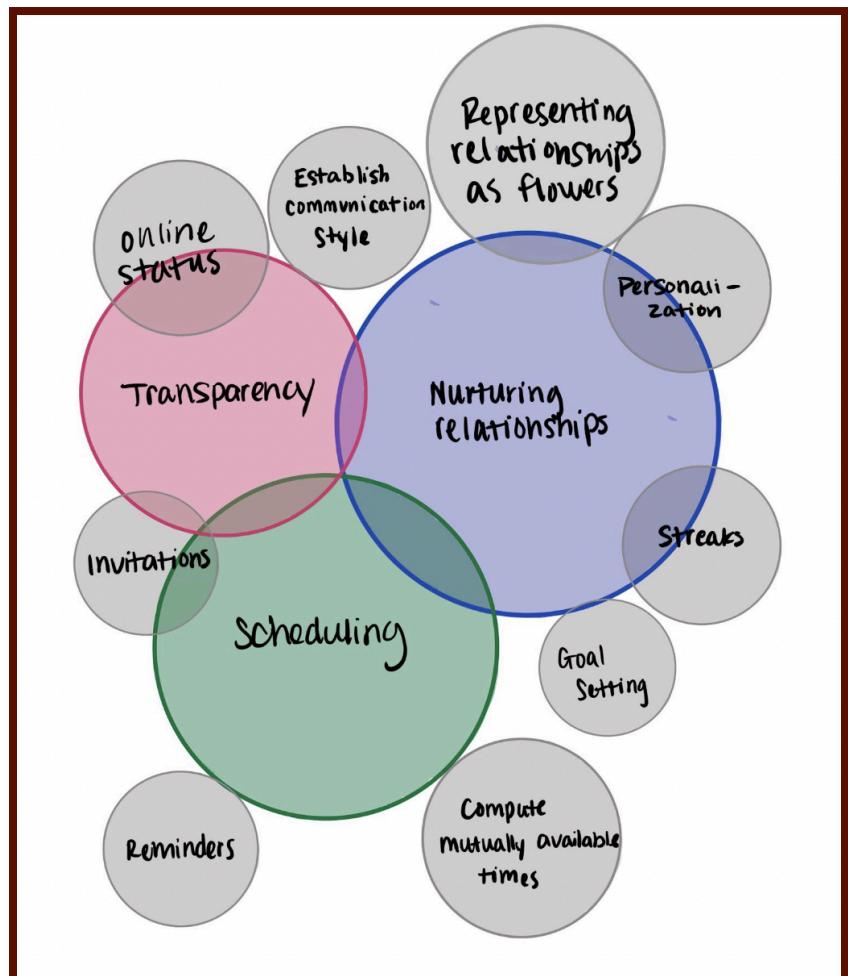
To get a good look at our system, we tried to look at our solution through the eyes of our three personas, whose main characteristic is outlined in the system map itself. Because Busy Bessie and Lazy Louis respectively struggle with their schedule and energy levels, they approach our system through **invitation rather than self-motivation**. It is unlikely that they would take extra steps to manage a long-distance relationship out of their own volition without a push in the right direction. Ideally, they would receive a reminder or notification outlining what steps they should take to participate meaningfully in the app. It could involve receiving prompts or seeing a conversation prompt handed to them. From here, their actions would influence the health of the flower. Emotional Emiko is the main instigator of flower care, **setting goals and reaching out** to her friends to improve her long-distance friendships.

Through this system path, we found that most activities rely on the user being able to **see their flower's status** before and after most steps on the app, leading to the impression that the **status of the flower should be visible on the central page** of our solution. We've also acknowledged that **too many types of notification could be too much** for individuals like Louis and Bessie, who would be dissuaded by having to complete **too many steps** to manage their friendships. Perhaps skipping the notification and having the **flower directly accessible** via a widget on their phone screen would be more effective. In this system, we've implicitly assumed that conversation would happen outside of the app, but this would require users to log in both before and after interactions with their friends, which further supports **reducing complexity** and having success and failure depend on **simple, one-click interactions** rather than submitting summaries of conversations.

## Bubble Map

After understanding our solution's system, we created a bubble map to see how these features connect and how relevant they are to the app's function. In this case, the larger circles represent the central functions of our application, with the circles in colors representing the three main goals of the solution.

When creating the bubble map, we organized our MVP features into three core functionalities that our app hopes to deliver: **nurturing relationships, reducing friction around scheduling, and enhancing transparency**. Nurturing relationships is the crux of our app, **represented through the flower maintenance page**, where users can water their flowers and contact their friends, which lent many of our functionalities to be centered around it. Thus, we denoted this with the largest circle. Our **scheduling** functionality would mostly be controlled through **user settings and profile customization** as users tailor the app to automatically schedule reminders for interactions that best suit their needs and goals. Finally, our red circle, **transparency**, is represented by the **visual representation of the flower** in the solution and a **signaling method** to friends about what communication styles and preferences the user has declared on their profile.



Features such as personalization (naming, decorating, etc), streaks, and goal setting are all ideas we can incorporate to help users maintain their long-distance friendships. The other core functionalities of our app could be more prominent, but we gathered ideas from our user research that were pain points to solve.

We found transparency essential to establish as different communication styles may **distort people's expectations of** receiving responses. Some ideas we had to establish this were to set an online status that more explicitly invites users to chat (possibly represented by gestures with the flower) or by being able to display the user's communication styles and preferences. Regarding scheduling, we hope to compute times for people based on availability to streamline coordination and provide reminders for people to reach out to friends when they have the opportunity, such as when trying to pass time on a commute.

### *Reflection*

By implementing these different maps, we were able to **visualize our solution from the users' points of view**. Features started to fall into place as we explored how someone interacting with our solution would experience moving through different pages as they explored our app daily. With these models, we could move toward a solution with the semblance of a structure rather than building up the app based on our assumptions as developers.

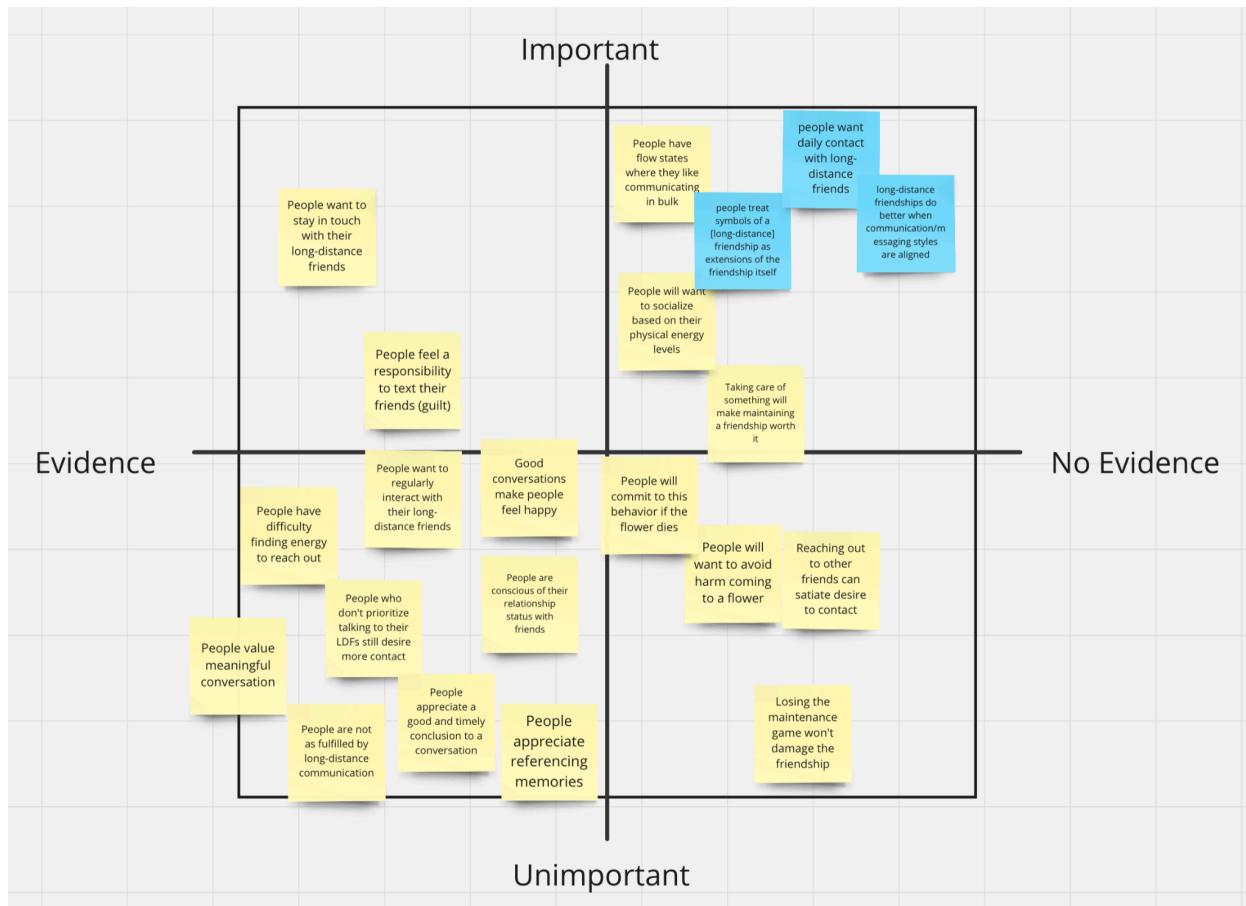
Because of the findings from our story map, we wanted to **prioritize personalization in the app**, allowing users to **set their preferences** for their profile and how they interact with friends. Through this customization, users can approach the behavior-changing goals of the solution on their own terms, reducing unrealistic expectations of users. The bubble map highlighted how **simple and streamlined** our app would have to be to ensure a pleasant user experience. With few features to implement, users should be able to **move through the app quickly** with little confusion. To implement this, we prioritized **minimalist design** and **straightforward prompting** to avoid introducing friction to a straightforward solution.

The **system path diagram** was particularly helpful in our process since it became outstandingly clear that the **flower status page** would be the most interacted with the page of our solution, given that users frequently had to be reminded of the health of their long-distance friendships. Because of this, we ultimately decided to make the **flower's status the center of our application**, even considering expansions where the health of multiple flowers is available to the user without opening the application, either through a widget or an extension.

## Assumption Testing

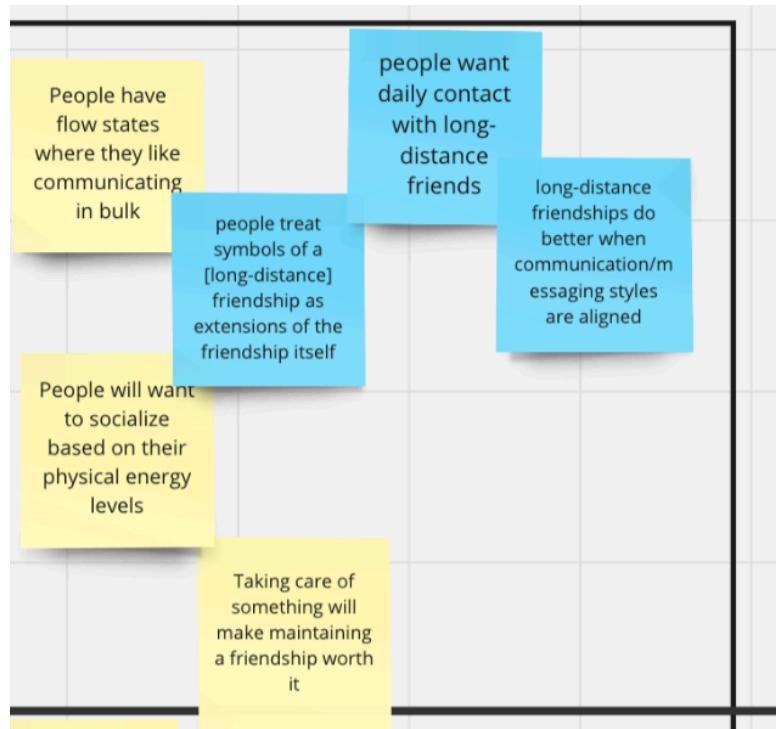
With the creation of our solution came several assumptions we were making about our users and how they would interact with the application. Until now, we had relied on the personalities and needs of our personas to guide our implementation. Still, as the design became a reality, we had to ensure that the steps we were taking were founded on the behavior of actual people.

### *Assumption Map*



We created a grid with four quadrants along two axes, unimportant to important and evidence to no evidence. Our goal was to map the assumptions we were making about users on this grid, focusing specifically on assumptions that would be vital to the proper function of our solution that we still needed to confirm. Below is the full assumption map:

To validate our solution, we focused on the assumption with no evidence whose correctness still needed to be verified. In



particular, these three blue squares indicate the top three assumptions we needed to test, as they were on the highest end of both axes. While the other three assumptions were still important, they were less related to the solution we had crafted thus far. As a result, we tested the following key assumptions:

- (1) People treat symbols of a long-distance friendship as extensions of the relationship itself.
- (2) People want daily contact with their long-distance friends.
- (3) Long-distance friendships do better when communication styles are aligned.

#### *Assumption Test #1: Symbols*

One of our assumptions was that people treat symbols of a long-distance friendship as extensions of the friendship itself. This was critical to analyze, given that we were considering using flowers as symbols to motivate long-distance connections in our intervention study and using symbols in our project.

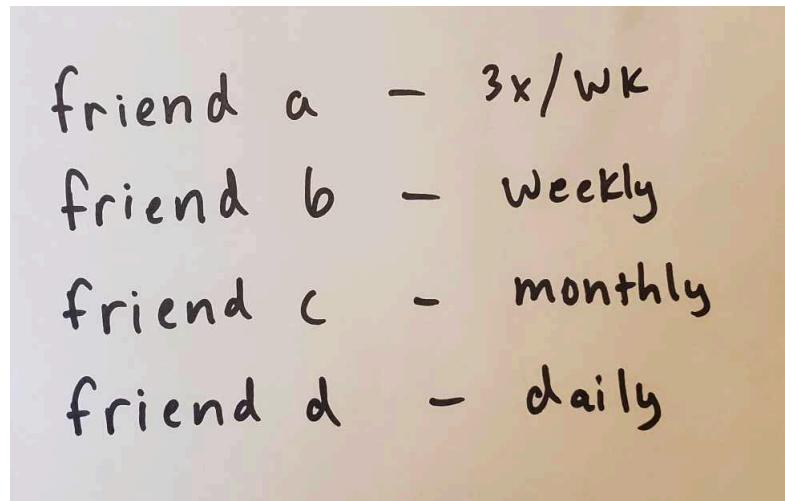
To verify that people treat symbols as extensions of friendship, we first asked them to name a long-distance friend who is important to them. Then, we had them draw two identical flowers on two different sheets of paper. After this, we used a marker to label one as “a flower” and the other as “a flower representing your friendship with [x].” Then, we asked them to recycle one of the papers and keep the other to bring home.



We measured if people were more likely to dispose of the drawings of flowers that did not represent friendship.

### *Assumption Test #2: Contact Frequency*

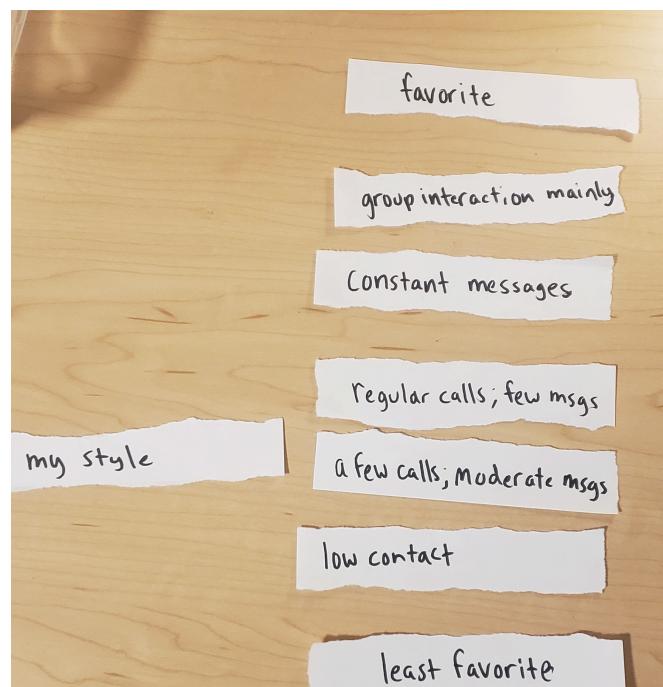
Our second assumption was that people want daily contact with long-distance friends. Given that we have been assuming this level of contact, this was critical to analyze; we had to know the ideal level of contact for any possible solution.



To verify that people want daily contact with long-distance friends, we had them write down a list of their long-distance friends. For each friend, they listed how often they would contact them in an ideal world. Then, they listed how often they want to contact long-distance friends in general. This would help us measure their desire for contact, whether daily or otherwise.

### *Assumption Test #3: Communication Style*

Our final tested assumption was that friendships improve when communication or messaging styles are aligned. This was important to analyze given that we are building for people with different types of messaging styles (i.e., throughout the day v.s. during one larger session), and we



should know how different communication styles mesh together.

We first asked them about their preferred style to verify that long-distance friendships improve when communication/messaging styles align. Then, we gave them sheets of paper representing a few prominent styles and asked them to rank them based on how ideal they were for one of their long-distance friends to have. After this, we probed their thoughts about the ranking.

This helped us measure people's stated preferred methods of communication with their friends and their favorite communication styles.

### *Assumption Test Reflections*

Overall, our assumption tests were very straightforward, and participants reported that they enjoyed participating.

For assumption #1, we tested five participants (all college students or recent graduates). In practice, we modified the methodology above slightly to account for people completing it digitally—participants who drew digital flowers were instructed to delete one of them instead of physically recycling it. Four out of the five participants recycled or deleted the generic flower and saved their friendship flower, demonstrating that symbols of friendships are indeed valued (key insight). With regard to our solution, we know that we are on the right track to use symbols of friendship (key insight) within our app. Furthermore, we know that using flowers as a specific symbol of friendship are effective as well (key insight; approach). Anecdotally, based on short interviews after assumption test #1, some participants reported increased connections to their drawings because they created them (key insight). With respect to the app specifically, we harness this insight by allowing people to customize their flowers, increasing their connection to them (approach).

For assumption #2, we tested participants (all college students or recent graduates), and we found out this assumption was incorrect. Instead, there was inter- and intra-participant diversity about desired levels of contact with LDFs. Although one

participant indicated desired daily contact with each of their four listed LDFs, the remaining participants did not have this level of desired contact with everyone, generally ranging between a day to a week (insight). Because of this, we also decided to let people customize their ideal LDF communication frequency, allowing them to tailor the app to their preferences (approach). With regard to this customization, we offer options ranging from daily to monthly (approach). Although no participants indicated monthly preference, we decided to expand our optional range slightly to include this given that we only had five participants and that they might not necessarily represent all of our users perfectly (approach). Furthermore, we had participants write down a number of their LDFs. Closer LDFs may come to mind first and be selected first (insight); it is possible that, on average, participants may desire increased contact frequency with closer LDFs (insight). Anecdotally, based on short interviews after assumption test #2, some participants reported that they didn't list all of their LDFs, just a few close ones (insight). Therefore, our approach of expanding the range of contact frequencies is justified (approach). Results aside, this assumption test could be slightly improved to be more understandable. One participant originally wrote that they wanted to contact their friends every 5–10 minutes. Upon further discussion, we realized that they answered regarding conversation length rather than contact frequency. In explaining the test, we could have been clearer in explaining exactly what "frequency" meant (improvement).

For assumption #3, we tested three college seniors. We found that their rankings aligned with our assumption, with their communication preference also being the ideal communication style their long-distance friend would have (insight). Based on this, we decided that our app only really needs to track the frequency with which the user engages with their friend (as that is under their control and their friend's styles are often aligned) (approach). One participant noted that Facetime was their preferred form of long-distance communication. Interestingly, however, the rest of their ranking did not align with the forms of communication that were most similar to Facetime. Despite Facetime's preference, the participant surprisingly ranked Zoom as their least favorite form of long-distance communication, associating it with work or group calls, contexts deemed less ideal for personal interactions. All of our participants had a disdain for

Zoom (insight). Moreover, they ranked calling rarely and texting frequently as their next most ideal form of communication, noting that this option may even be preferable to Facetime, depending on the frequency of how often their friend would want to Facetime (insight). This insight aligns with the rest of their ranking, as they valued more sparse communication due to the fact that they would feel forced to talk about something new each time. Based on our interviews [and regardless of desired frequency], we found that casual, low-stress options were preferable because for the average long-distance friend, our participants did not have much to talk about, but still wanted to keep in touch (insight). Tangibly, we added Instagram integration as an option to our application due to it being low-stress and casual, all while supporting a variety of different desired contact frequencies (approach). For example: you could send your friend memes every day, or you could send them a meme once per week. Future versions of our app will have a variety of different communication options to track so that we can account for the diversity of human connection in LDFs (approach); however, for now, we feel that our team did a good job of selecting a communication style that is relatively commonly shared among people and their friends (approach).

In summary, our assumption that people value symbols of their LDFs was validated, and our assumption that people want daily contact with their LDFs was invalidated (instead, there is diversity both between people and between friends concerning how often people wish to contact LDFs), and our assumption that people like matching communication styles was validated. We would not make any major changes to how we approached our assumption tests in the future; the only changes we would make would be to allow for digital participation explicitly (we did this, it just wasn't in the original plan) and to clarify some terms more to participants (such as what "frequency of contact" meant).

## **Low-fi Prototype**

With our assumption testing complete, we created a low-fidelity version of our solution, starting with the bare minimum: wireflows. We selected four main tasks we wanted our users to accomplish and designed flows through a theoretical solution to simulate the steps a user would take through each task.

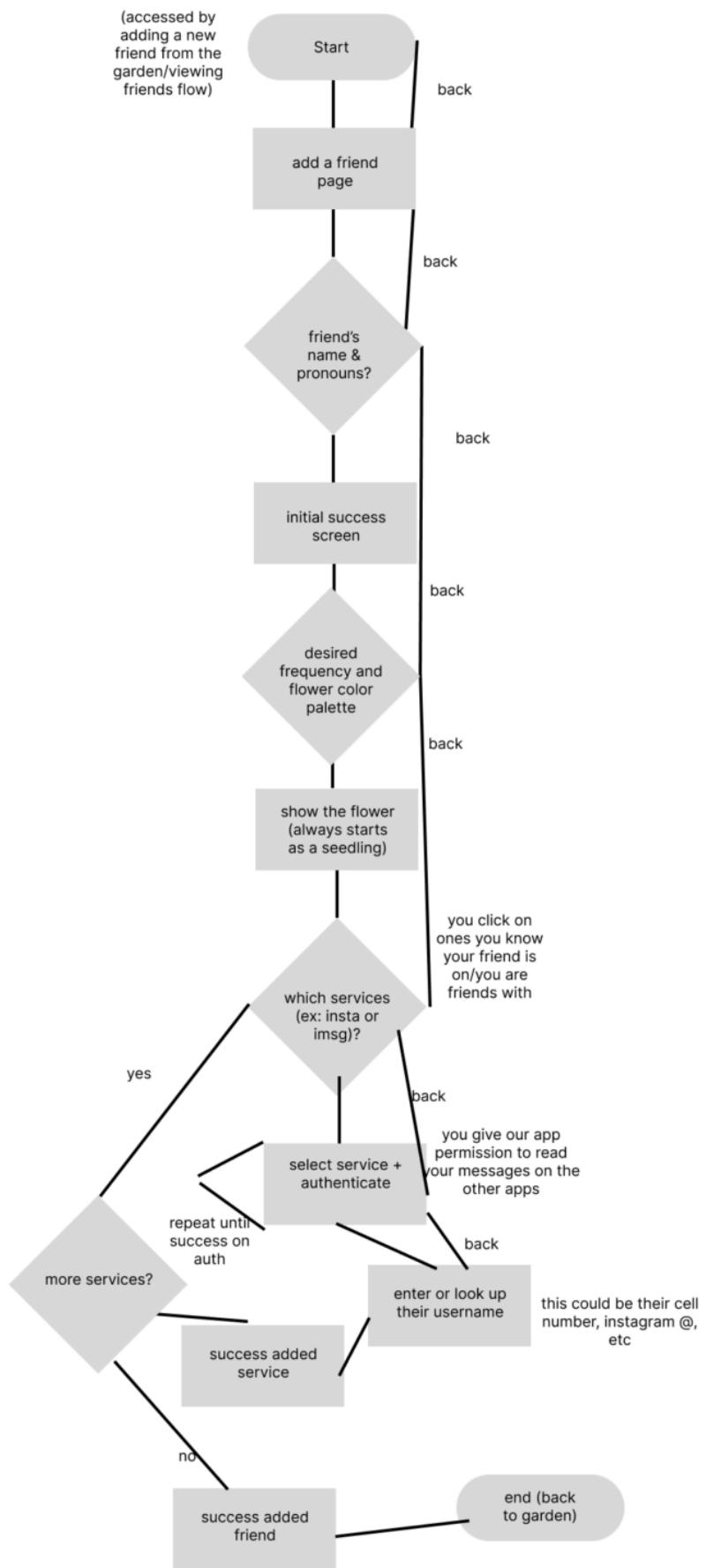
At this point, our team decided to slightly change the focus of our app so that it's more one-sided. This is so that users do not have to worry about getting their friends on the app or about the stress that comes from having a shared representation of a friendship (ex: if friend A lets a Snapstreak die, it may reflect poorly on them. But friend A had a streak only of when they send messages to friend B, friend B doesn't need to be involved). It will also greatly simplify the process of engaging with the app. This also means that no password/forgot password, login, sign-up, or privacy settings are technically required, as it can all happen locally and be stored locally on the device.

Specifically, what we mean when our app is one-sided is that a friend can have their garden of flowers based on their other friends, without their other friends needing to get the app or opt-in.

An assumption is inherent in this new individual design: people are interested in investing in relationships when there is a lack of reciprocation. Based on our interviews, people sometimes felt guilt for not responding to or engaging with their long-distance friends enough/promptly, and some felt the need to improve. This points toward their openness to improve individually. Additionally, some of the apps on the market, like Catchup and Smart Contact, that we looked at for earlier portions already utilize this assumption, showing it's tested.

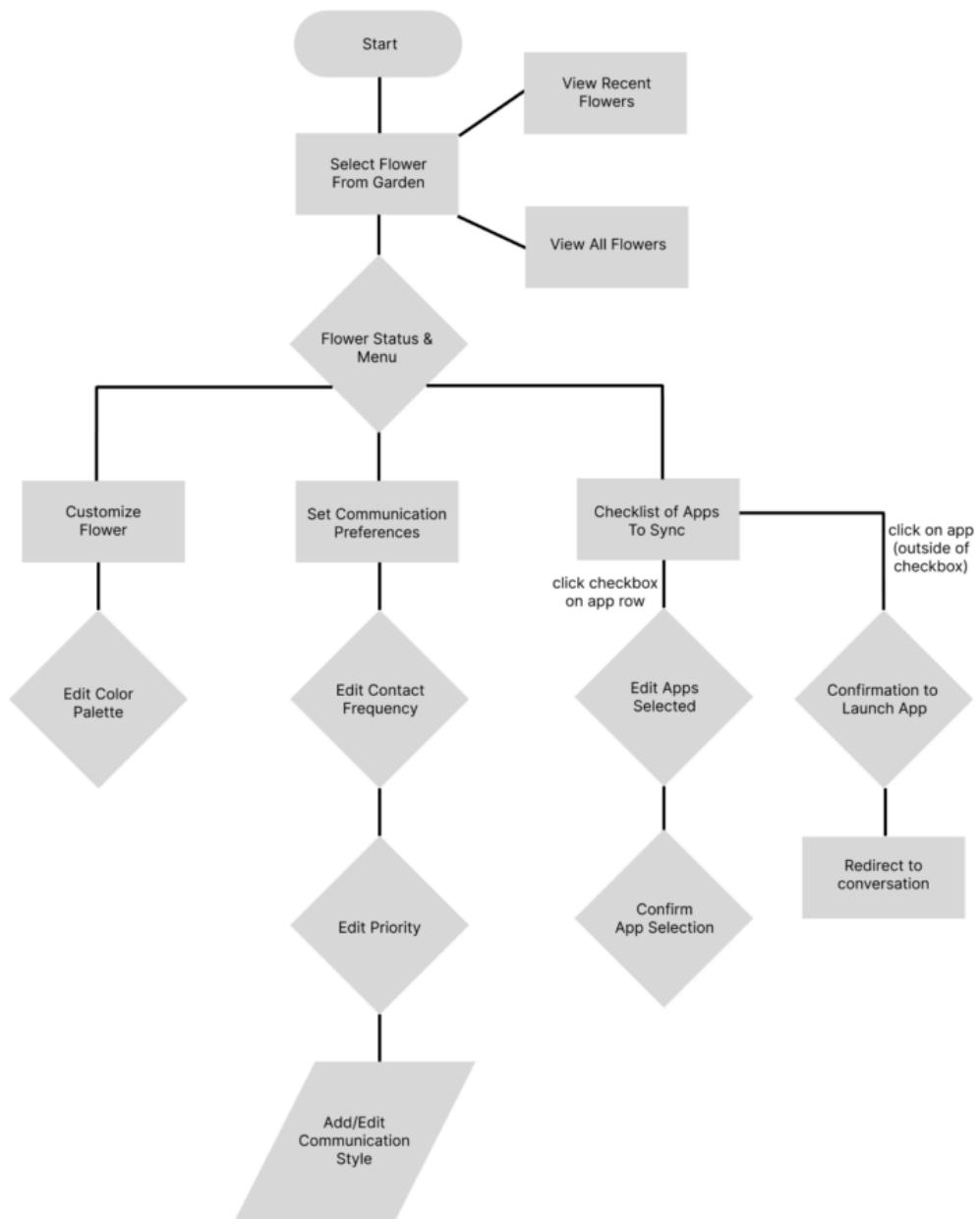
### *Wireflow #1: Adding a Friend*

The best path for this flow involves adding a friend's name/pronouns (not your own—this is done elsewhere in the app), choosing a flower color palette and desired communication frequency, identifying where you connect with them (this includes authenticating with other apps, like WhatsApp, iMessage, and Instagram, and selecting your friends' username(s)), and submitting to add their flower to the garden. This flow includes enough explanation throughout that it can serve as a part of onboarding.



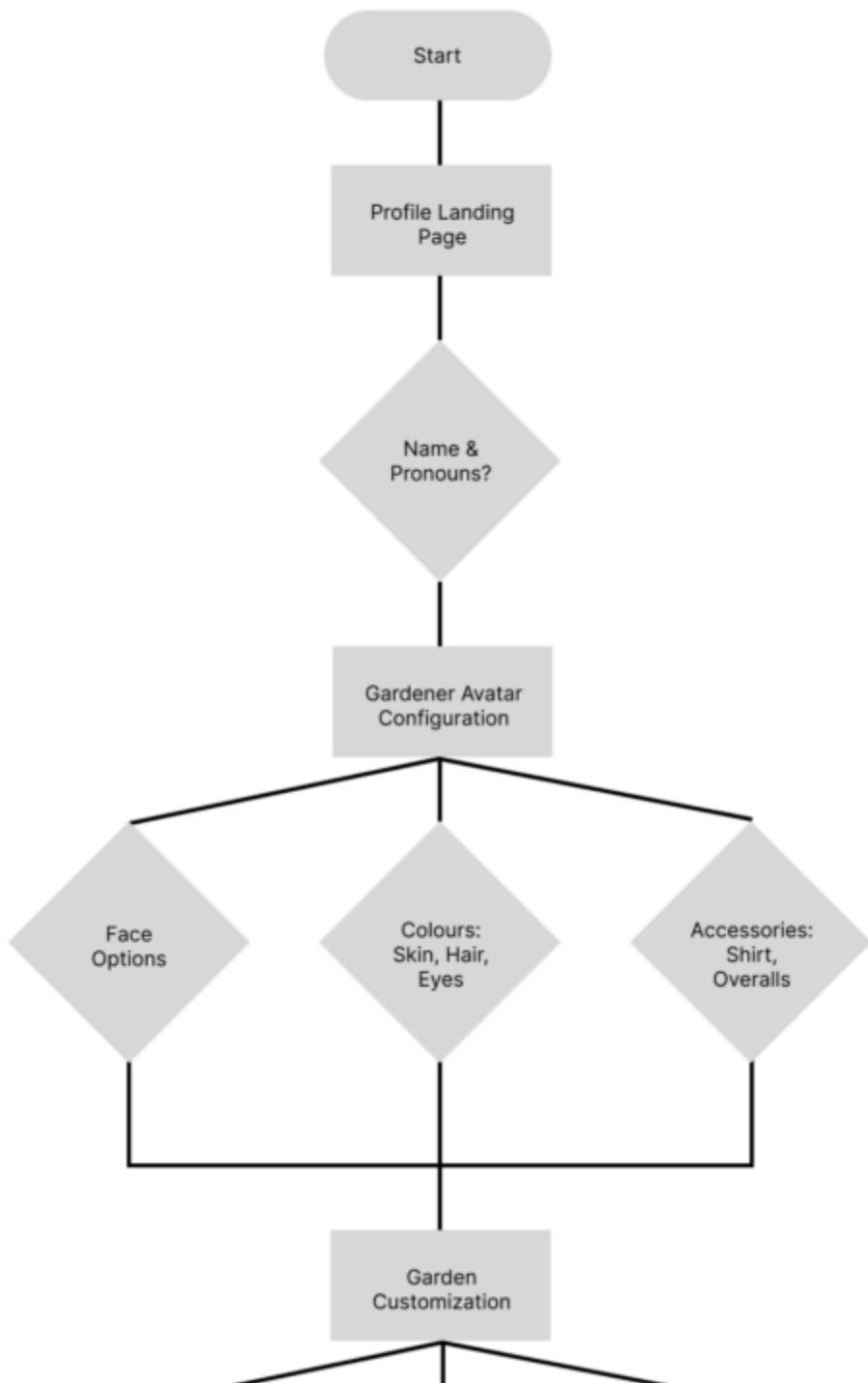
## Wireflow #2: Viewing Existing Friends

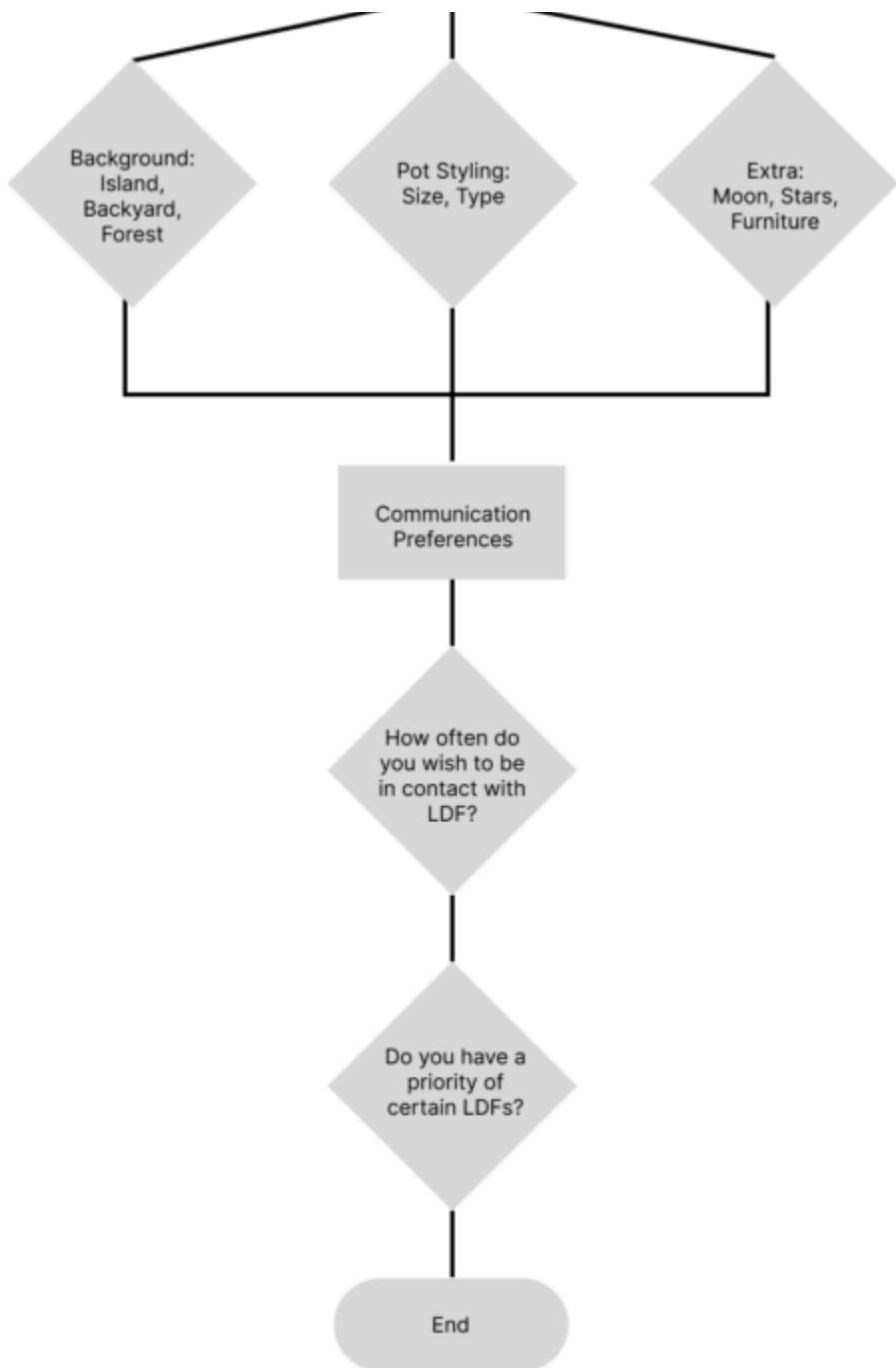
The happy path for this flow involves a garden where each flower inside represents a different friendship. Clicking the flower leads to a screen that monitors its current status and growth and other customizable options such as communication style preferences and customizing flower cosmetics. Many customization options will lead back to the task flows presented during onboarding.



### Wireflow #3: Navigating User Profile

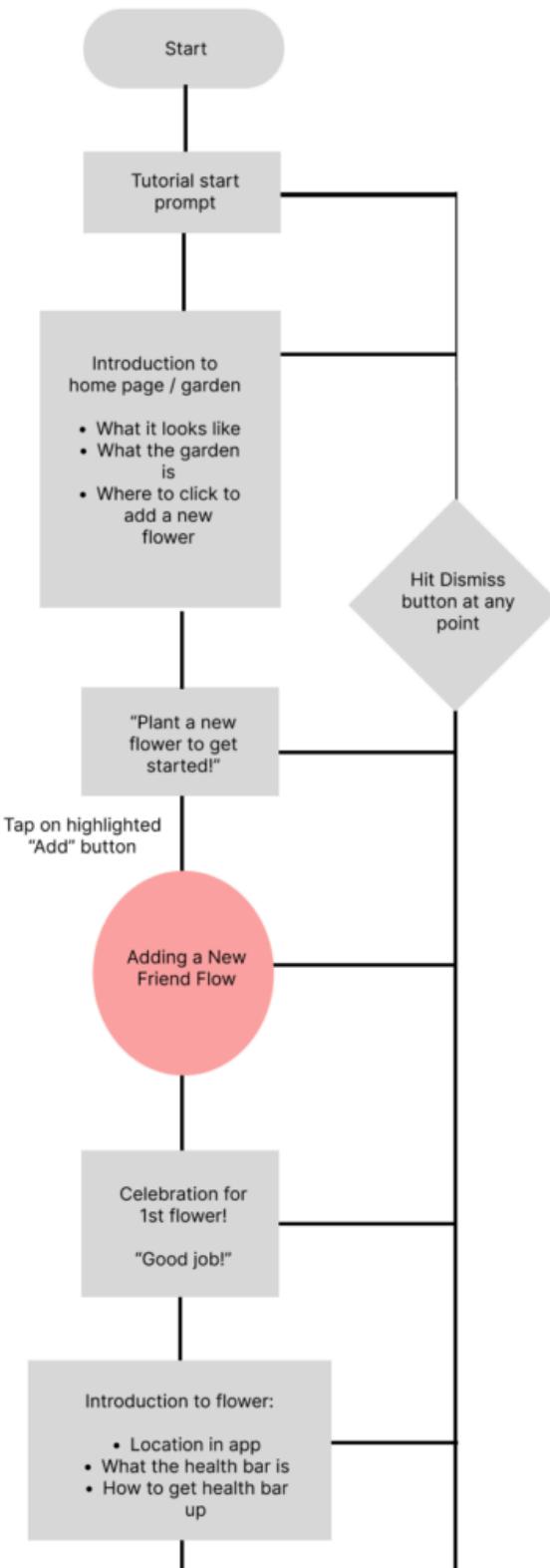
This portion of the flow is the first entry point of the application, where users can set up their profiles and set their preferences for the frequency of communication with their LDFs. The happy path involves the user setting their name and pronouns, configuring their gardener avatar, and configuring their default communication frequency.

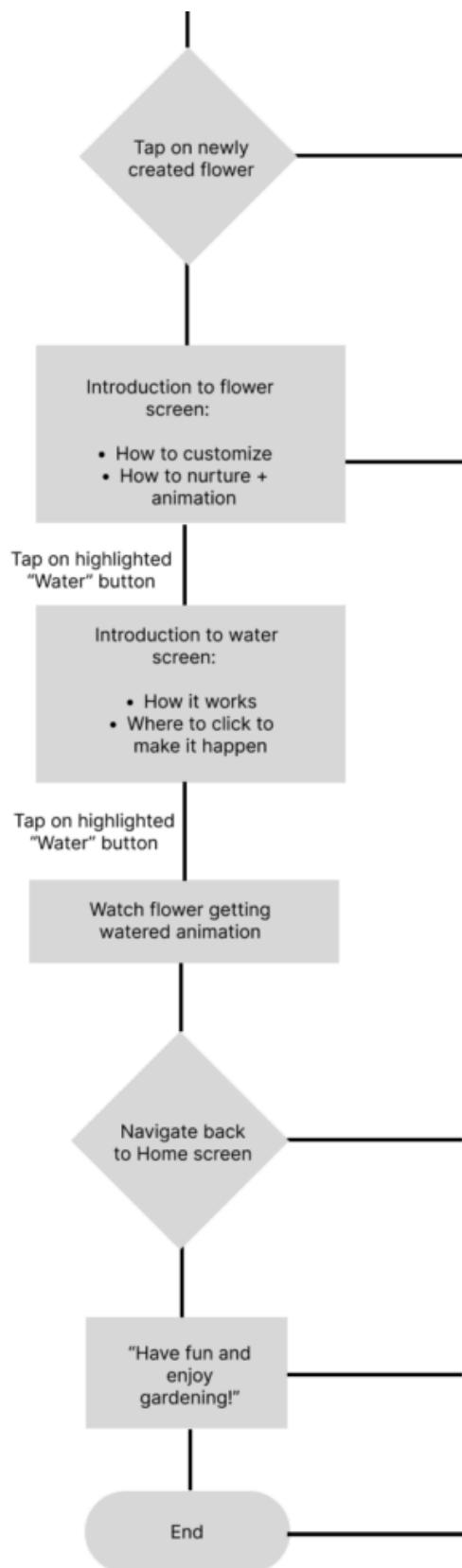




## Wireflow #4: Onboarding

This flow depicts the onboarding process as users first log into the application. The app carries them through their home page, creating a flower and the rules of friendship maintenance. At any point, the tutorial can be skipped.

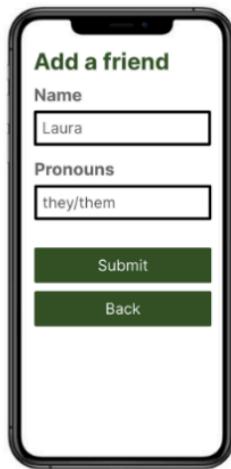




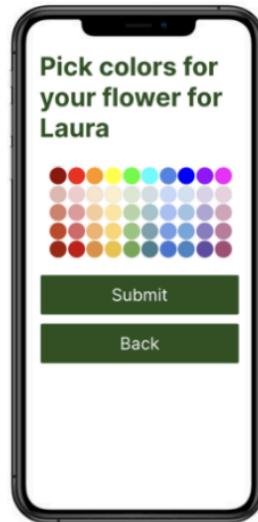
## Sketchy Screens

For each workflow, we created low-fidelity sketches of what the UI would look like. Below, each screen is drawn in detail with an explanation for their UI. For a complete description of each set of screens, [click here](#).

*Adding a Friend.* This should be a relatively streamlined process that is visually manageable to the user. For that reason, we chose to make the friend-adding process multiple pages that ask one question at a time instead of making users interact with a multi-question setup page. The current UI design aims to reduce the activation energy required to add a new friend to the app while allowing more forgetful users to input all the necessary information to have a good experience on the app. To improve these screens from their initial drafts, more selection options, such as choosing platforms to connect, driven by logos and images over text, were added to ease the cognitive load on the user. The text was also enlarged to make navigating easier for the user.



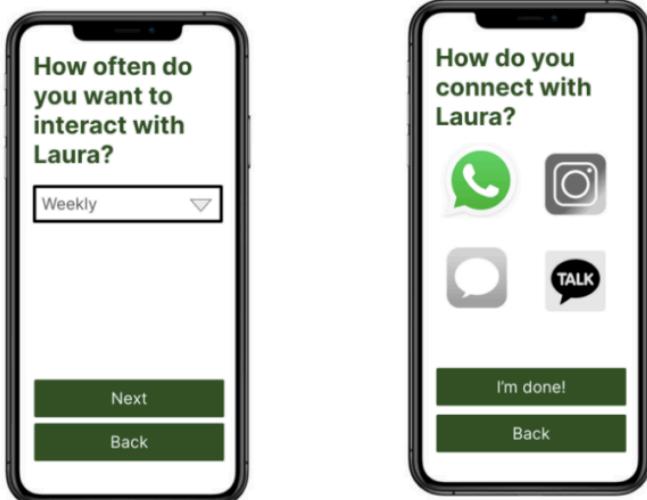
credit: [https://www.freepik.com/icon/sun\\_1400310](https://www.freepik.com/icon/sun_1400310)



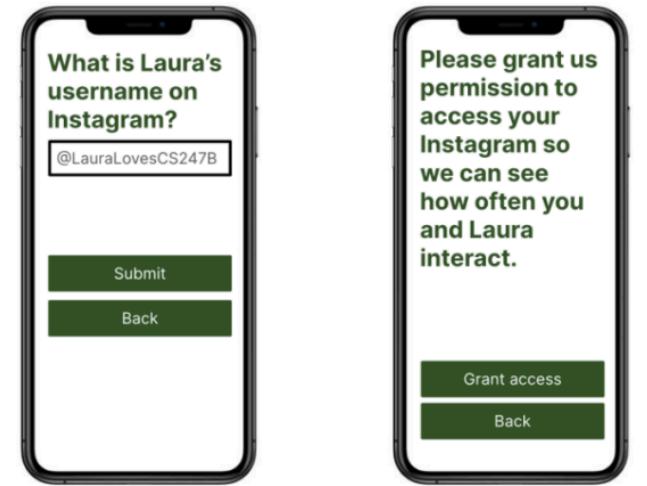
credit: Google Docs color picker



credit: [https://www.flaticon.com/free-icon/flower\\_9029931](https://www.flaticon.com/free-icon/flower_9029931)

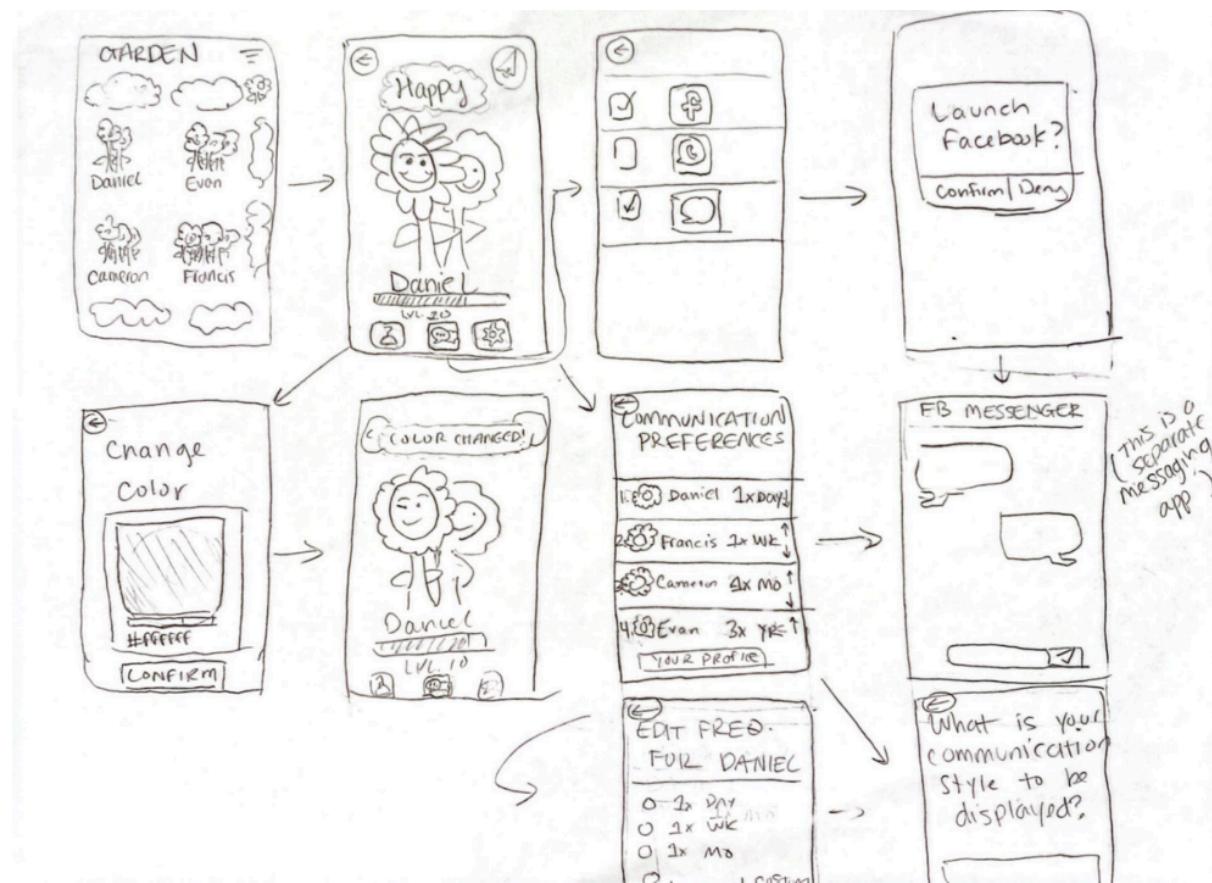


Services are greyed out if you haven't selected them here yet. The "I'm done" button only shows up when you have selected and connected at least one service.

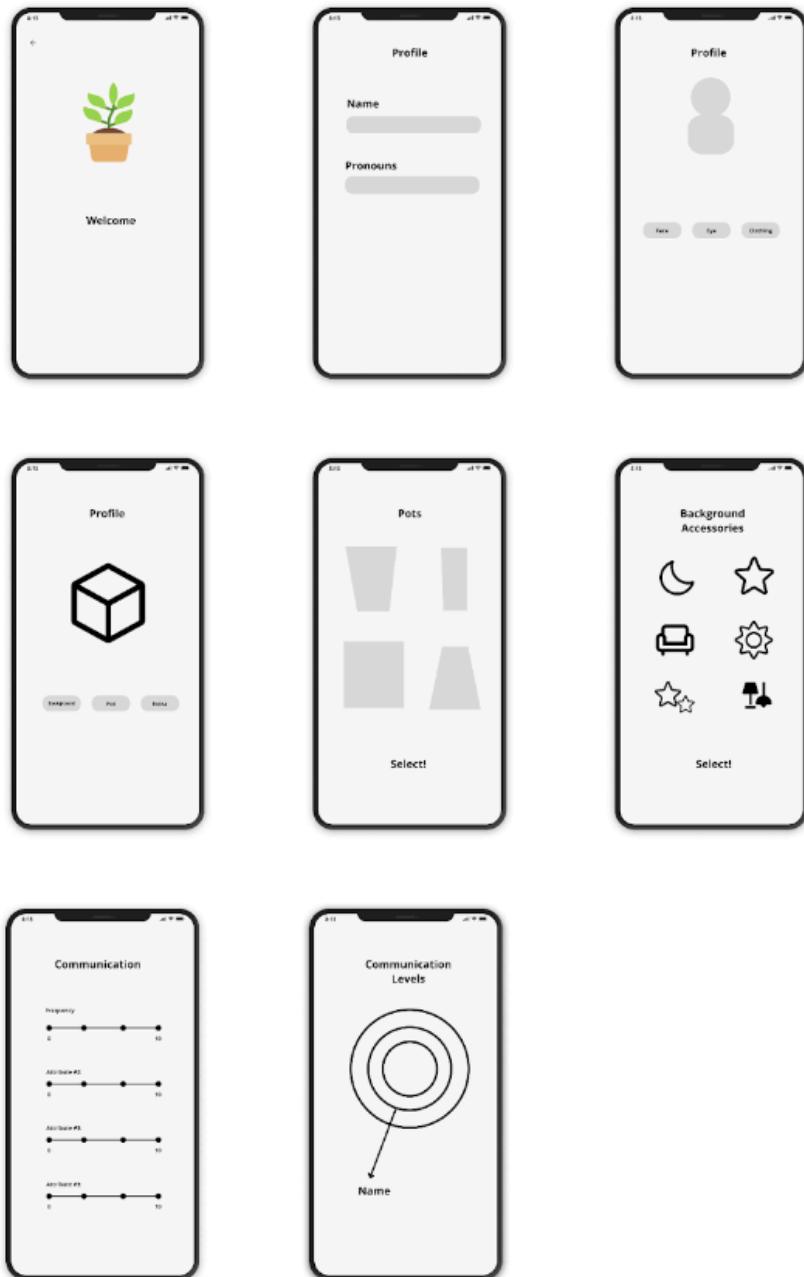


Asks for username on apps like Instagram; asks for cell # for stuff like iMessage.

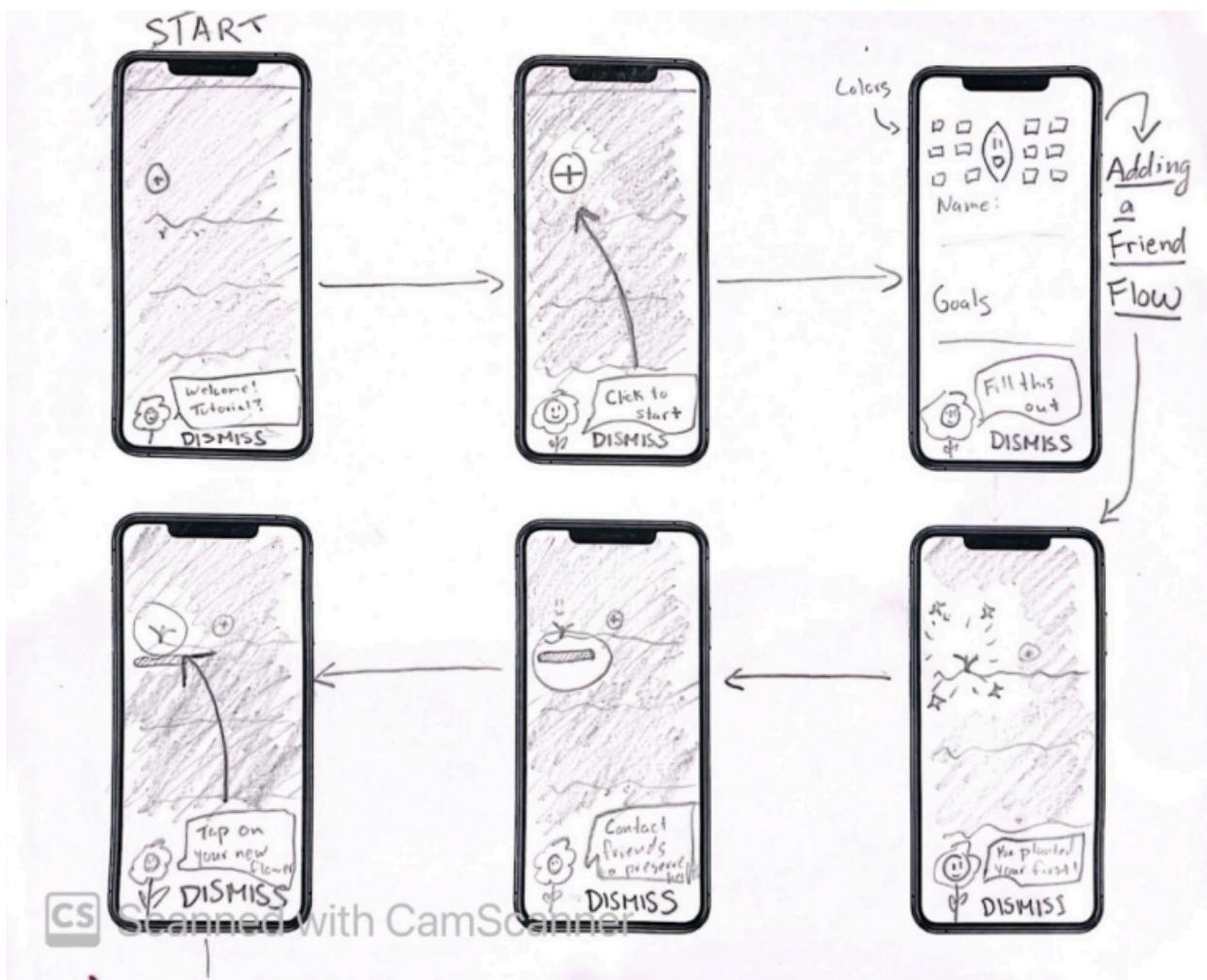
*Viewing Existing Friends.* The ability to see the details of a friendship flower is especially central to our solution as our approach depends on the visual depiction of the relation being engaging and dynamic. For this reason, we chose to make the flower a central figure of the friend profile navigation page so that the users could continue building connections between the flower and their friend. From here, they can use the page as a central hub for messaging, adjusting settings, or personalizing. To improve this from its original design, we improved the ability to navigate the app by including back buttons to avoid accidentally trapping the user on a page. Additionally, we improved the iconography and replaced icons and text with more universal options to improve the user experience.



*Navigating User Profile.* With our user profile navigation, we explored a much more minimalist design, giving the user a simple approach to navigating their profile. We wanted to focus user attention on their friends, flowers, and garden rather than giving them too many customization options for their profile. While this assumption is still untested, we wanted the user's friendships to be the primary driver of engagement with the app. To improve these screens from their original iteration, we added more user options so that the user could feel personally connected to their avatar, even if we didn't want it to be a focus. We also added more detail on the options available to our users.



*Onboarding.* We chose a cute flower mascot for the onboarding UI to walk you through the important steps of interacting with the solution. We want users to feel encouraged by our app to create friends, so positivity and friendliness are essential first impressions we set out to make. The tutorial follows a simple process that concludes with an animation of their friendship flower growing so that users can experience a visual reward for making it through. This ideally builds momentum through success to keep planting flowers and nurturing them. The user can exit the tutorial at any point if they no longer want to finish it. To improve this from its first iteration, we included a “Dismiss” button that would allow users to refuse to participate in the onboarding process, as well as more detailed instructions for different parts of the app to introduce the user to our solution thoroughly.





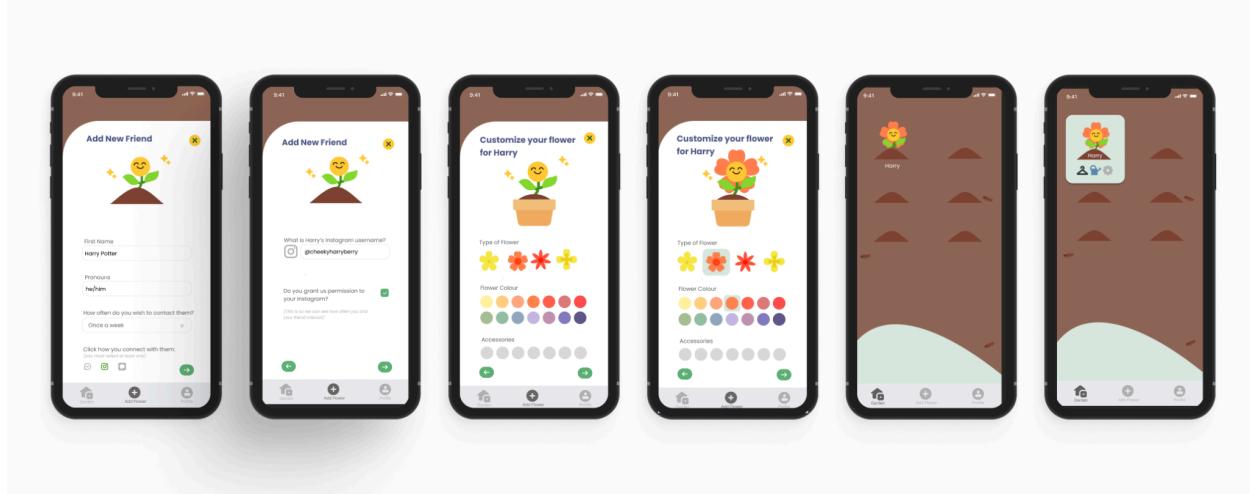
## Medium-Fidelity Prototype

Based on our low-fidelity prototype on paper and Figma, we worked on the first draft of our [medium-fidelity prototype](#). In this phase of our prototyping, we focused on the key flows of the user experience: adding a friend, viewing existing friends, navigating their user profile, and onboarding. Below is an explanation of the initial designs for this phase of our project, with details added for each flow.

### *General Design Process*

Throughout this phase of our design process, we gained critical insights into the usability of many features we envisioned during our low-fidelity stage. We opted for less iconography to create a more clean, minimalist aesthetic. This design decision was motivated by our desire to instill a sense of calm in our users while **simplifying the experience** to make it as **cognitively manageable** as possible. We also wanted to make it obvious what aspects of the app users should focus on, so we amplified the most essential features of the prototype using **cute characters and color**. In much of our early research at the beginning of our project, a key theme that arose from user interviews was self-reported **fatigue and stress** users would experience when thinking about long-distance friendships or trying to initiate conversation. Thus, it was our key goal to reimagine a way for people to contact their friends in a quick, streamlined way while **reducing their stress and anxiety** levels as much as possible.

### *Adding a Friend*



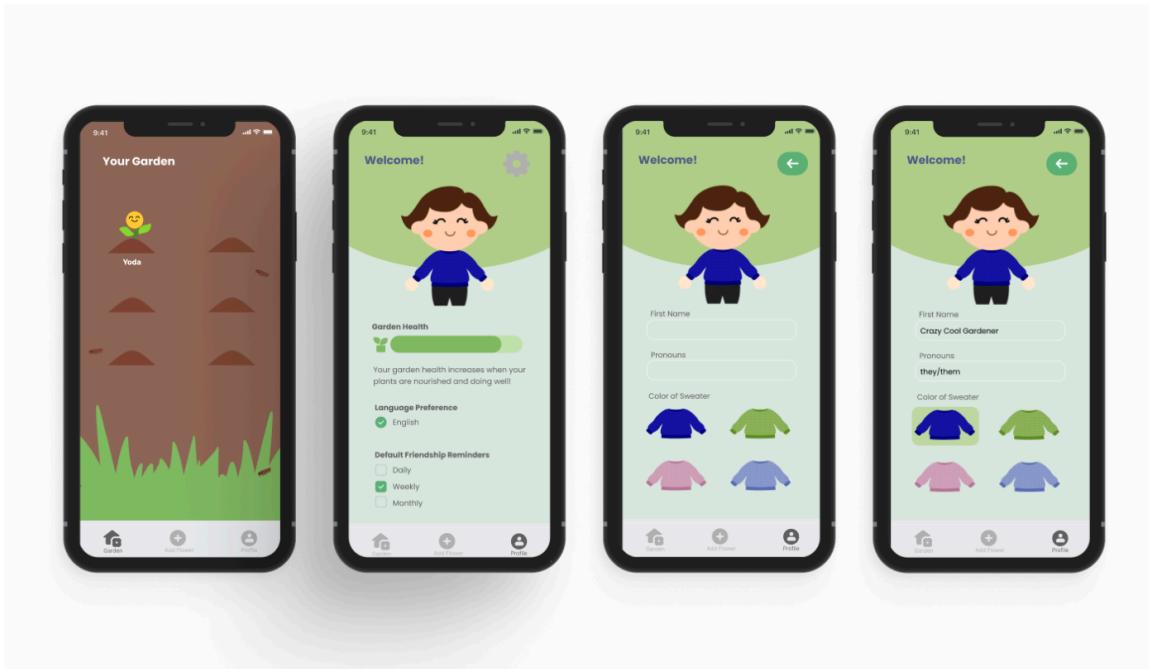
In this flow, we wanted the user's experience to be intuitive and easy. Given these goals, we tried to **limit the questions** we asked the user to set up a friend's plant profile. The intent was to simplify the process of friend creation to **reduce the already high energy requirements** that some users would need to get to this step, as we saw with Lazy Louis' persona. This led us to a few essential questions split across two screens. Given our desire to **respect user privacy**, we also added a permissions question and popup.

### *Viewing Existing Friends*



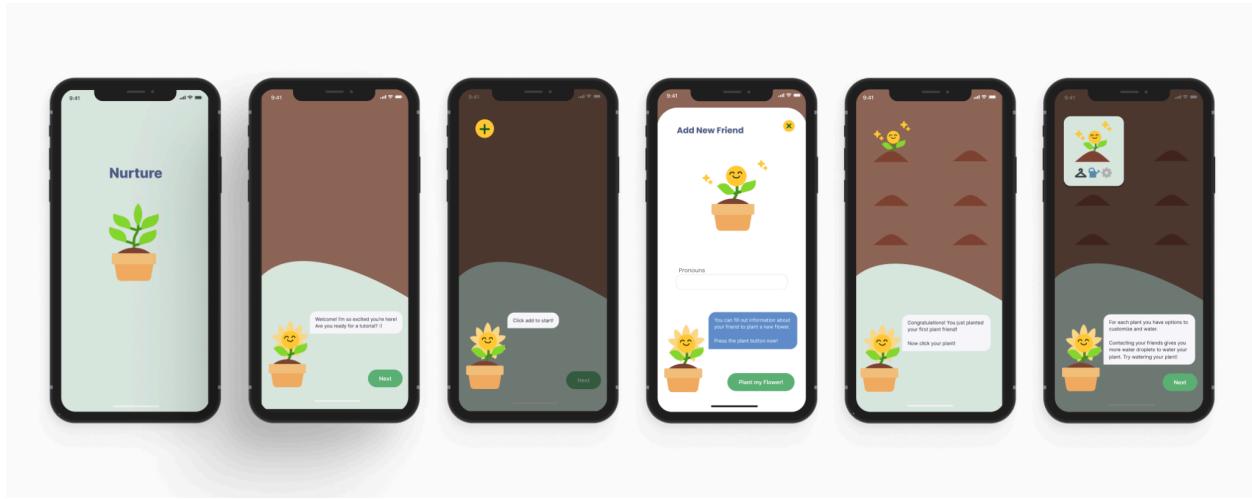
In this task, we wanted users to be able to interact visually with their long-distance friends immediately upon opening the app. Because friendship health visualization was the most effective finding in our earlier design stages, it became the main page of our medium-fidelity prototype. By doing this, we made it easy for users to access their plants for their friends by intentionally placing the Garden screen in the main button navigation.

## Navigating User Profile



In this flow, our goal was to create an avatar customization page that made them **self-identify with the character** maintaining their garden **without distracting them** from the app's primary function, which is long-distance friendship maintenance. The avatar has **simple customization options** and mainly exists to **add a dimension of fun** and customization to the solution. This flow still needs some conceptual feedback from testers, but for the sake of our prototype, we can assume it accomplishes these goals through the cute character design and simple editing procedure.

## Onboarding



For the onboarding task flow, we chose to **personify the tutorial flower avatar** more, given our goal of **increasing the user's emotional investment**. It speaks throughout the app's introduction, and several features only appear until the user has arrived at the respective tutorial point. With this, we decided to introduce new users to elements of the app **one step at a time**. This would help them **digest each of our features procedurally**. This would ideally leave them feeling like they understand our solution's important aspects without much trial and error.

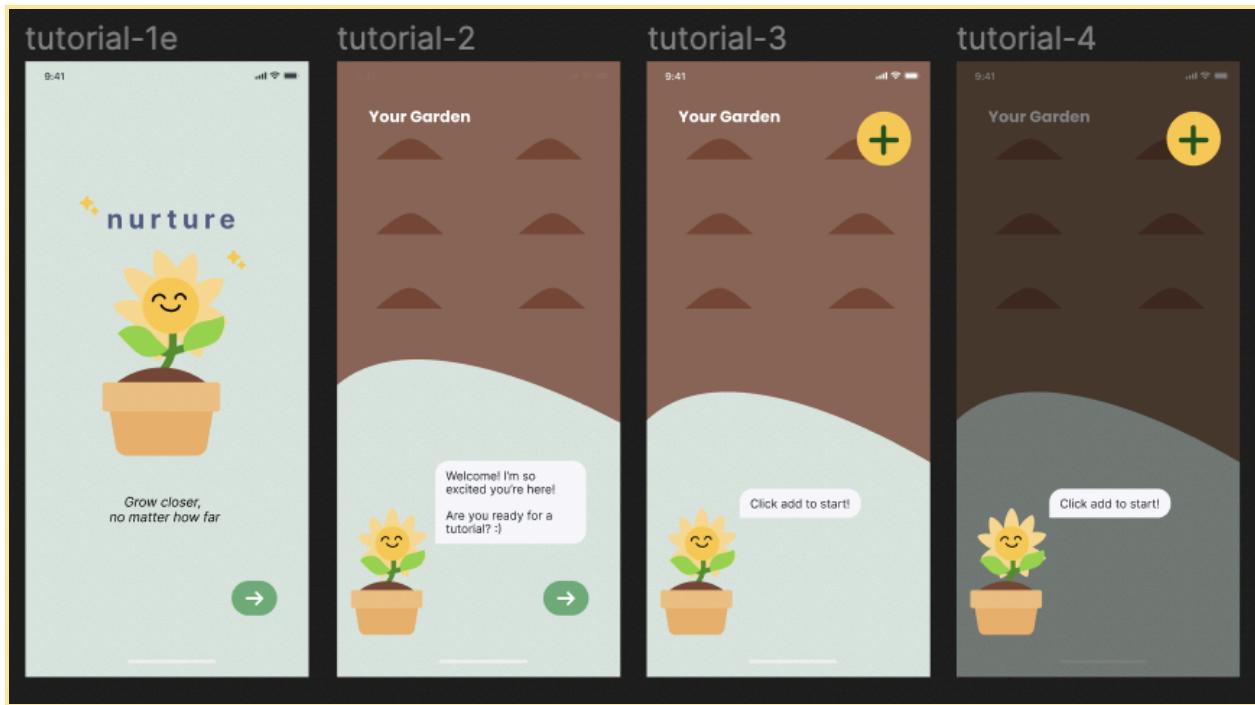
## Usability Testing

After creating a medium-fidelity prototype, we set out to improve it through usability testing. We set out several tasks in a **semi-structured interview format** to receive qualitative feedback about where each part of the solution could be improved for future users.

### Task Design

We created three main tasks for participants to complete as part of our usability testing. Throughout the tasks, we asked participants to share their thoughts out loud so that we could collect natural opinions from those interacting with the prototype.

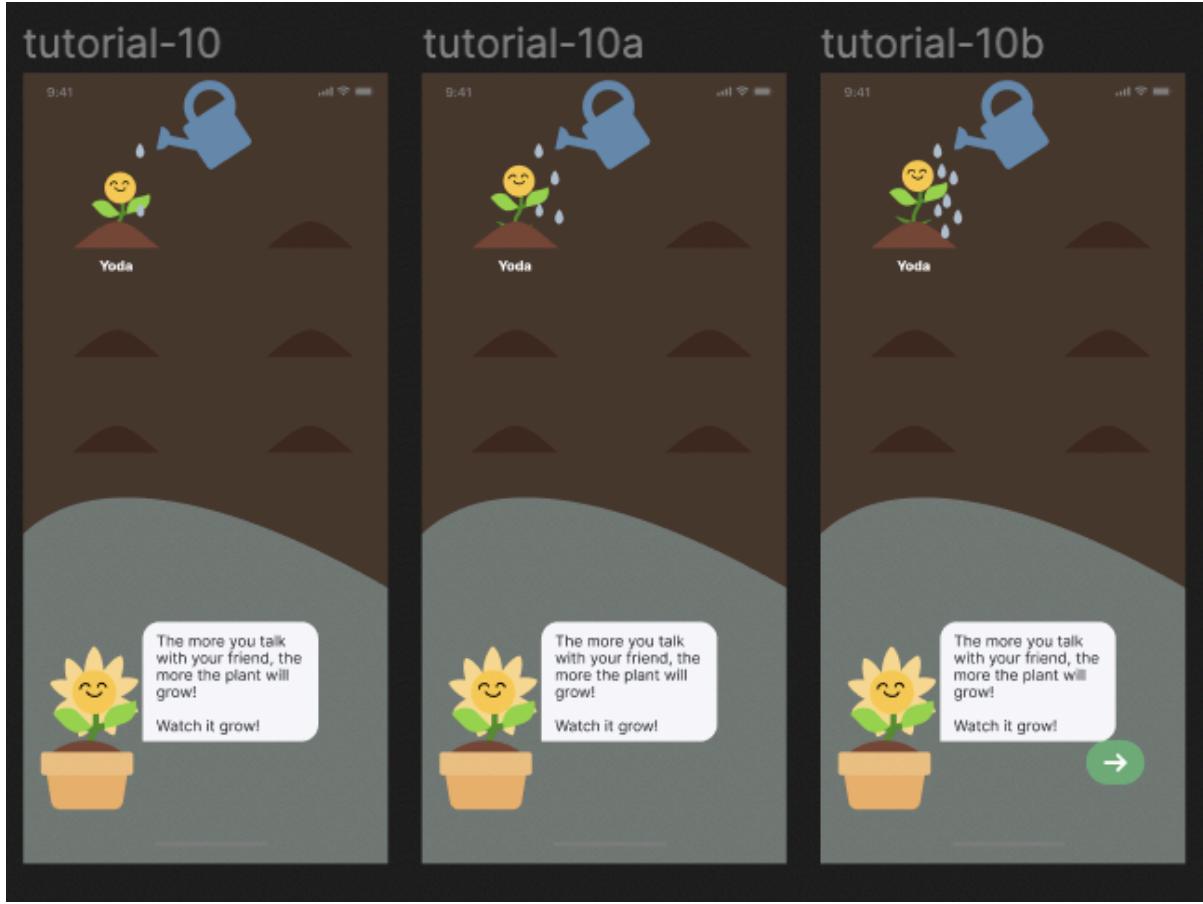
First, we had participants conduct an exploratory walkthrough of the app, asking them to share what initially caught their eye about the solution, what feelings the design elicited, and what interactable figures attracted their attention. The instructions were: *"Imagine that you just installed a phone app that you heard helps you maintain long-distance friendships because your classmate recommended it. You've finished installing it, opened it up, and are free to explore."* This task was followed by semi-structured questions about the tester's commentary. Below is a look at what the user would see as they engaged with our questions about their first impressions.



Our second task was a structured activity where the tester was encouraged to create a visual representation of their friendship. The prototype could accomplish this by having the users plant a new flower in their garden. The text of the question was as follows: *"Imagine that Harry is one of your close, long-distance friends. You've decided to use the app to support your friendship with them. Show me how you would add this friendship as a flower to your garden."* As with the previous task, users would receive no explicit guidance about how to complete the task. Instead, they were encouraged to vocalize their confusion as they progressed through the task. Below is a screen flow of how the user would correctly move through this task in our prototype.



We wrapped up our usability test with a maintenance task, which we decided to include as it would likely be the most frequent task given the app's structure. Individuals would care for the flower that represents their long-distance friendship. The instructions' text was: *"Imagine that you just finished having an amazing, fulfilling conversation with your long-distance friend, and you want to see how the flower of your friendship has grown."* Once again, our data was qualitative, so we aimed to collect information from participants through their commentary and actions. This task was simple on the prototype and could be accomplished by interacting with the screens below.



## Results

Based on valuable feedback from our teaching staff and peers throughout usability testing using our defined tasks, we focused on several key improvements in our final prototype:

**(1) Onboarding:** Making it **consistent with the rest of our app's features**.

We needed to **add more detail** to walk the user through adding a new friend.

**(2) Design Consistency:** Defining our spacing and use of buttons, text sizes, and labeling; **increasing the size of buttons and text** to make them more user-friendly

**(3) Intuitive Interactions:** improve the medium-fidelity mockups with **labels**, consistent buttons, **transitions**, and more **detailed descriptions**

## Revised Medium-Fidelity Prototype

We created a revised version of our medium-fidelity prototype with feedback from our usability testing. Final screenshots of the prototype are added below for key flows, along with justifications for the changes made to each screen flow based on usability testing feedback. Screenshots of the new versions are included below. However, the fully [revised medium-fidelity prototype](#) is more effective for increased detail outside screenshots. Below is just a selection of screenshots detailing the flows described in the previous section.:

### *Onboarding*

Based on data from the usability study and peer feedback, we focused on the following changes:

- Consolidating some of the button sizings
- Increasing the size of our navigation buttons
- Adding more visual assets to create a more cohesive design
- Adding design details to the landing page to enhance the brand and user experience (i.e., animation of app character and project tagline)

Which resulted in the following revised flow:

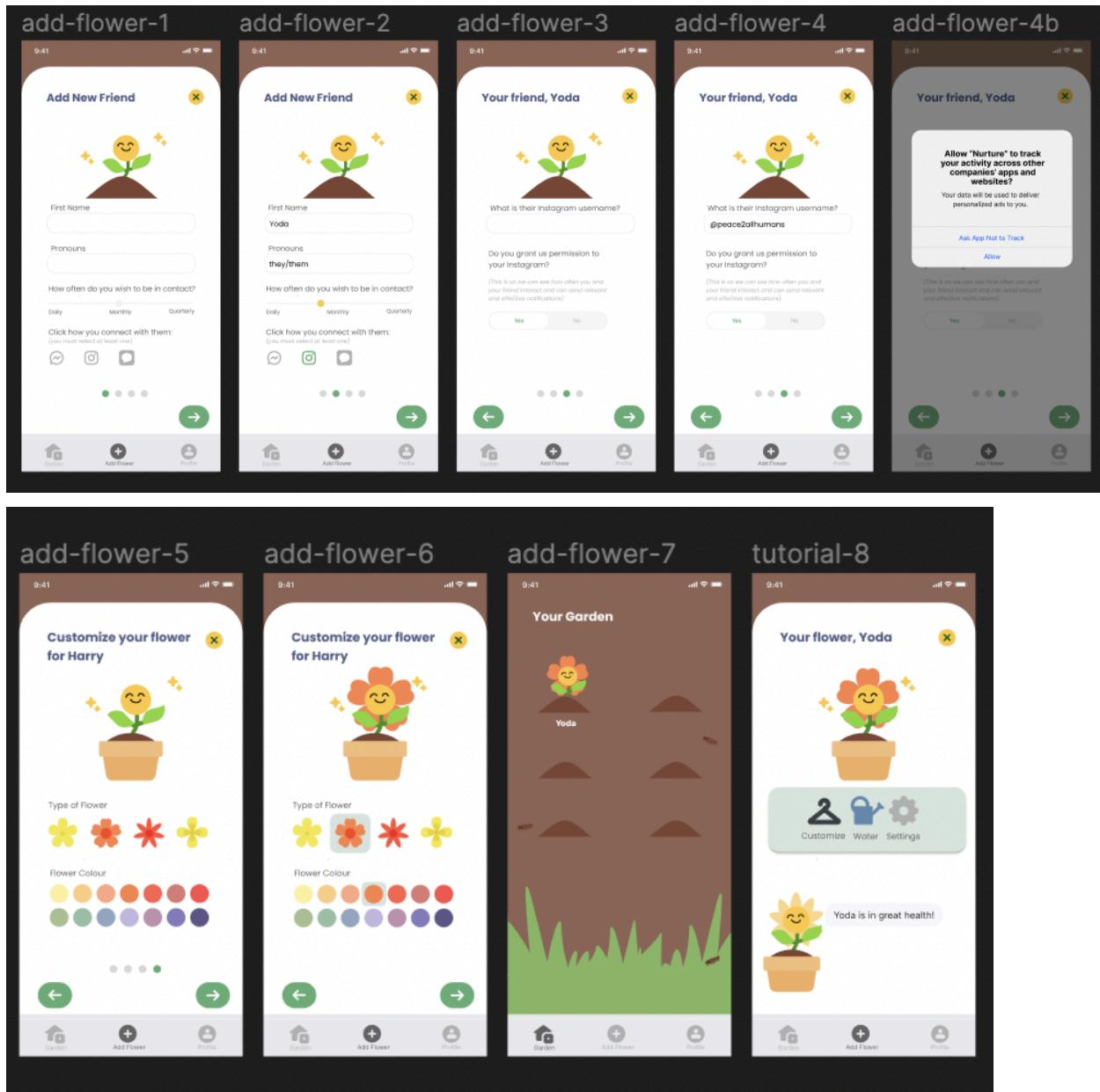


### *Adding a Friend*

To improve this flow, we applied some of the feedback provided to us in the form of:

- Improve consistency across spacing, buttons, and font sizing
- Added a permissions modal
- Increase information transparency to users from the application regarding personal information

The following flow resulted:



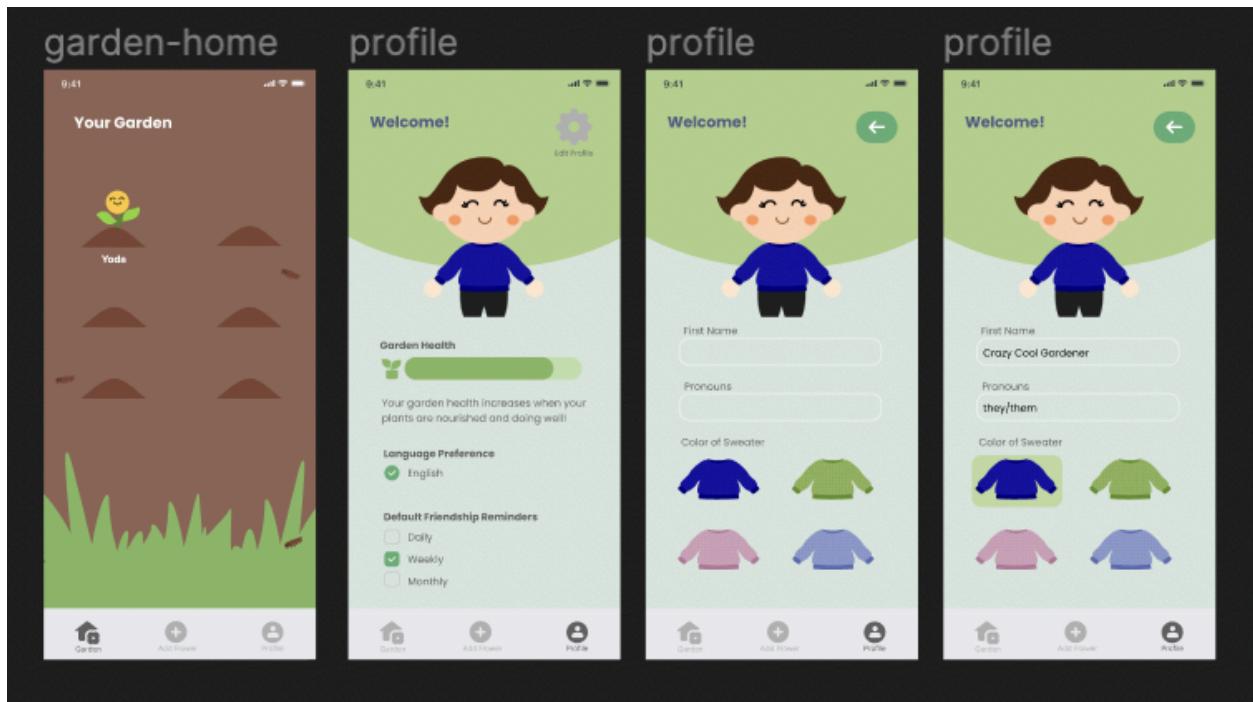
## Navigating User Profile

Based on feedback for our user profile flow, we made several of the following adjustments:

- Included a selector button for language choice
- Added description for the garden health indicator

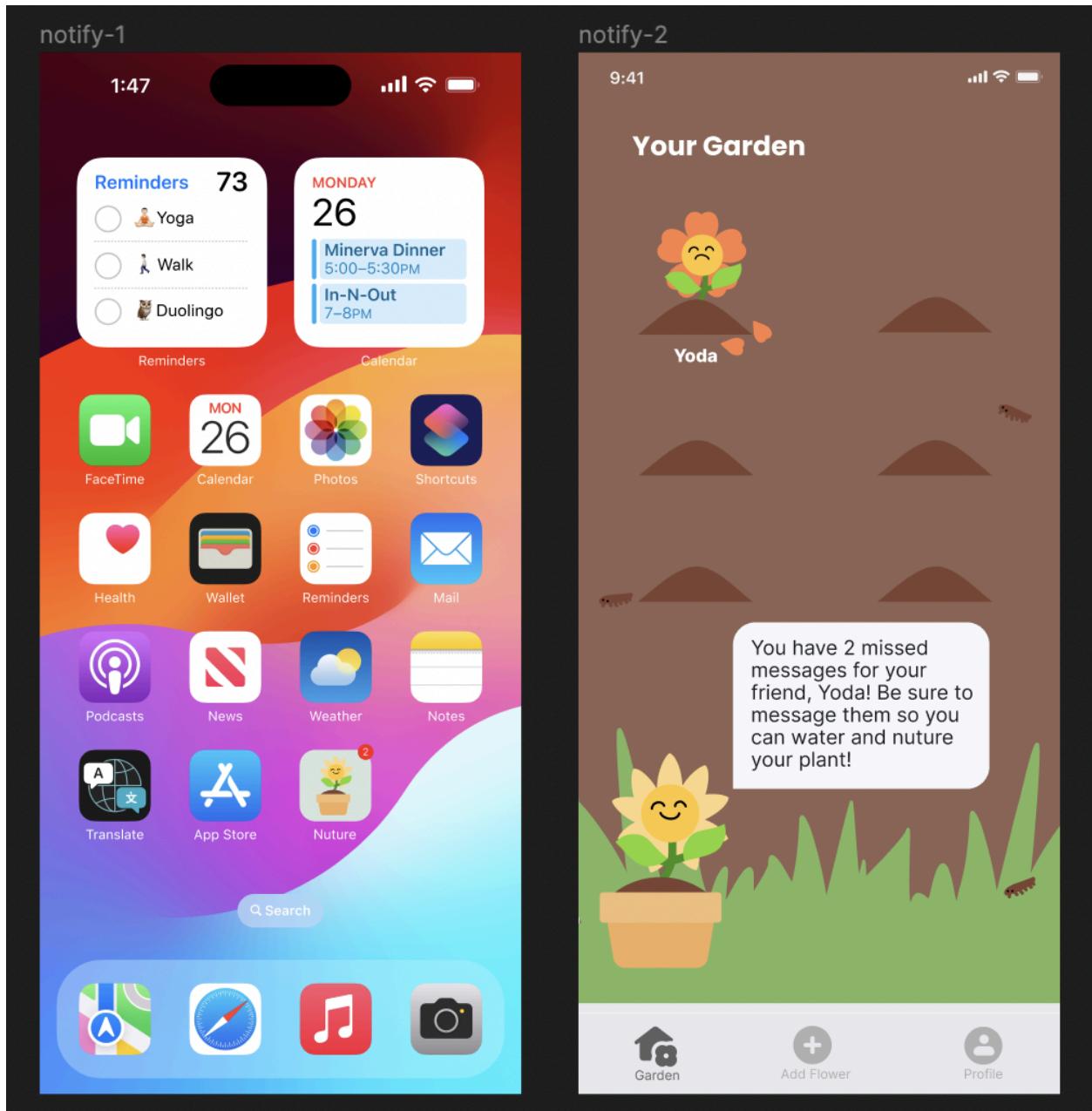
- Added increased customization for the profile avatar
- Adjusted sizing for the profile page

The implemented changes can be seen in the following:



### *Introducing Notifications*

In feedback sessions, users reported a desire to receive notifications from our app. To address this, we made it so that users could receive a notification, open the app to respond to a nudge, and reach out to their friends. Moving forward, we'd develop this flow to explore the most effective and ethical ways to prompt our users to adapt their behavior for the better. At this time, this flow still needs to be tested for usability. Below are the screenshots of this feature in action:



## Reflection

Moving forward, we'd want to account for many considerations in improving our user experience and design. Below is a brief list of key improvements we'd want to explore if we were to move forward with our solution:

- Addition of **more plant personalization** (this is based on explicit user feedback from our testing sessions in class, where we received overwhelmingly positive feedback on the customization flow and requests for added customization)
- Increase **diversity of incentive options** (eg. exploration of incentive representations beyond the watering can, such as sunshine rays and fertilizer)
- Addition of **external integrations** (eg. more integrations of other applications like Snapchat, Line, WeChat etc. while also providing flexibility for those who don't use other communication platforms/social media)

## Conclusion

### *Takeaways*

With our quarter completely engulfed by the study of long-distance friendships and how to improve the frequency and quality of communication between individuals who no longer share a physical space, we learned quite a bit about why long-distance friendships deteriorate and why they're so challenging to maintain. We did our best to narrow common problems down to three personas, but with more baseline study testing, we could have found many reasons why people may struggle to reach out to people they rarely see in person. We are confident, however, that our exploration into the foundational causes of communication frequency deterioration between long-distance friends could be at least partially encompassed by a mix of our grounded theory, proto-personas, and journey maps. We still have much to learn about helping friends reconnect across regions, but we're grateful for the opportunity to dive deep into a topic that each person on our team deeply values.

From a design perspective, we learned that sometimes less is more when it comes to many interventions around behavior change. As we began this project, we ideated complex solutions involving dozens of features that could have created a new social

media platform. Being forced to narrow down our interventions and solutions throughout our process helped us realize that the best approach to something individuals don't want to do may sometimes just be making a product that requires very little input from a user to achieve its goal. Our application could be easily transformed into a widget that receives a few clicks weekly.

Finally, with such a larger target audience, we experienced what it was like to design for a vast group of diverse personalities across every age, education level, and background. It was a perspective-shifting experience to base each step of our design process on studies and interviews instead of just designing a product for ourselves. Establishing each piece of our growing solution in collected data and established truth allowed us to create a carefully thought-out solution that appeals to as many people as possible.

### *Next Steps*

We would like to investigate various next steps in our project further. The areas we find most compelling are the addition of incentives and the study of quantity and quality interactions motivated by our application. Below, we'll delve into each step further.

*Adding more incentives.* One aspect of our design that we'd like to explore further is using virtual incentives to motivate our users to take action in real life. For example, our current design utilizes water droplets as a currency mimicking their frequency of communication. Perhaps other virtual currencies would be more effective in our app's goals to provide a calm, intentional experience that motivates our users. As we learned in class, universal design can also be limiting, given that not all symbols or incentive mechanisms affect users equally. Thus, exploring the possible personalization of such incentives would be the next interesting step.

*Quantity vs. Quality.* Another aspect of our design we hope to explore is testing the underlying incentive structure of our application. Though the current design supports frequent communication with a user's LDFs, this also left us curious to see whether this model is lacking in incentivizing meaningful and quality interactions. We

could revisit conversational prompting, but this would introduce several questions about how to personalize and generate these prompts for users and confirm whether they are desired. A future study analyzing the impact on communication quality would be a valuable next step in evaluating improvements we could make to our application in supporting this fundamental goal.

### *Reflection*

Assuming our next behavior design effort is connected to maintaining and improving long-distance friendships, we would like to explore interventions that leverage social psychology more significantly. Much of our approach in this course involved having individuals improve their long-distance friendships by changing their own behaviors. However, we wonder if it would be more effective to help pairs of long-distance friends change the way they interact with each other in such a way that it improves their communication quality and frequency. If our next design effort is more unstructured than this course, we will focus more on iteration through interviews with individuals in our target audience and a greater subject pool in our diary studies.

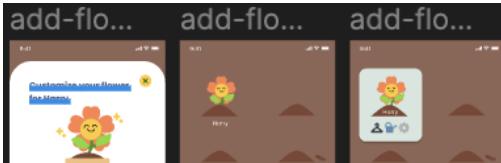
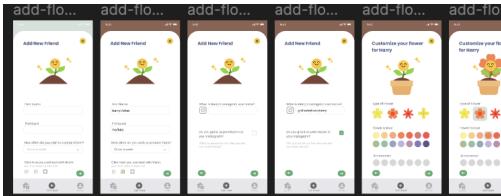
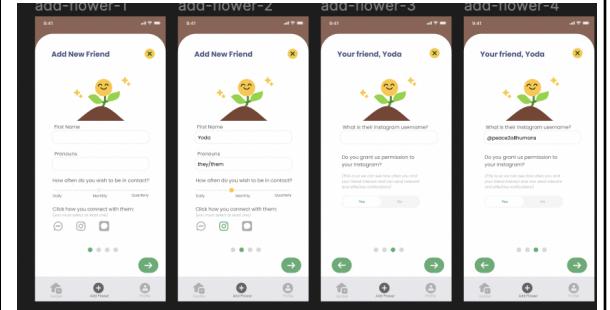
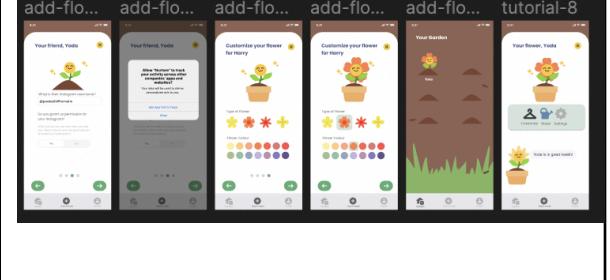
Outside of long-distance friendships, it might be more effective to **start small for our next design effort** and expand our solution as new evidence comes to light. Because of time constraints and variability between participants, many features and design choices were implemented without input from members of our target audience; it would have been more beneficial to **keep users involved** at every step of the process. This would include a **second intervention study** improved upon the original, with details that would carry over to a more faithful adaptation in our solution design. Features could be introduced more methodologically soundly without vaguely alluding to the same few participants who have completed all of our diary studies. To address this, it would be wise to **conduct a second or third round of user interviews** on their behaviors with long-distance friends to **create new personas**, which would then serve to widen our perspectives on what users of our app may look like. Furthermore, we'd like to have the opportunity to test our solution beyond its usability to determine if changes to our targeted behavior result from our design choices. A **new round of**

**usability testing** with **more complex tasks** on an improved medium-fidelity prototype would have moved us closer to a much more effective final prototype. Ultimately, we will carry what we've learned from this project into every future design project, and we're confident that our next attempt will result in a solution that leverages psychology, technology, and design principles to improve the lives of users.

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## Appendix

**Item 1:** Before and after table of medium-fidelity prototype and revised version. These screenshots are in separate portions of the above writeup; however, we place them side-by-side here to see changes clearly.

Flow	Before	After
<i>Onboarding</i>	 	 
<i>Add Friend</i>	 	 

<i>Profile</i>		
<i>Notifications</i>	None	