Ping!

Low-Fi Prototype

CS 147 Winter 2022

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INTRODUCTION

MISSION STATEMENT / VALUE PROPOSITION

So that your LDR, doesn't become TL;DR

PROBLEM AND SOLUTION OVERVIEW

When people move, they not only leave the place behind but also their relationships. Distance, time zones, and new stressors make it hard to keep up with loved ones. Introducing **Ping!**, a low-stress, convenient hub to show your friends you are thinking of them by sending thoughtful tokens, sharing meaningful moments, and maintaining connection goals. It's an angel on your shoulder reminding you to show your loved ones you care, even when you're busy or far apart.
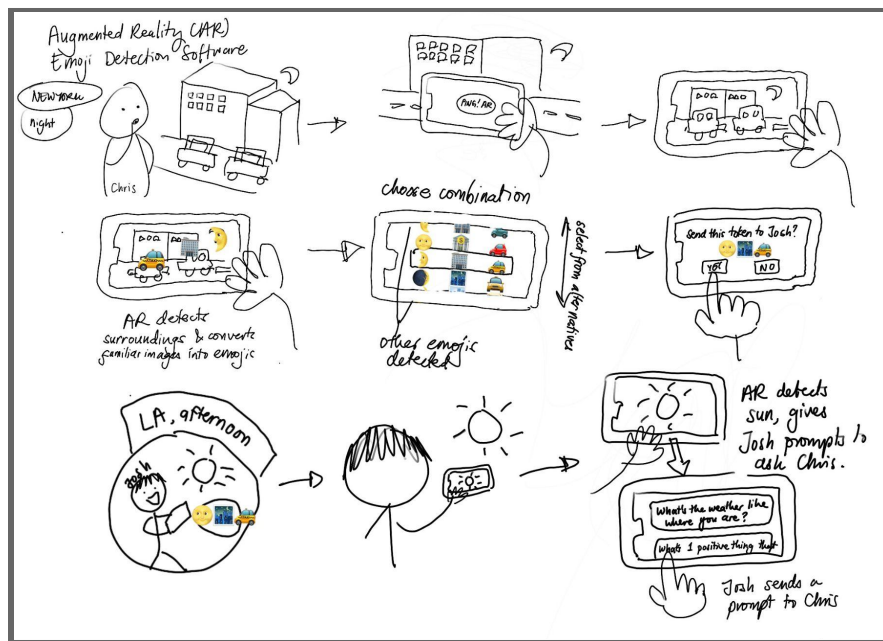
SKETCHES

Figure 1. An augmented reality device to easily discover and find emojis that represent a moment to share.
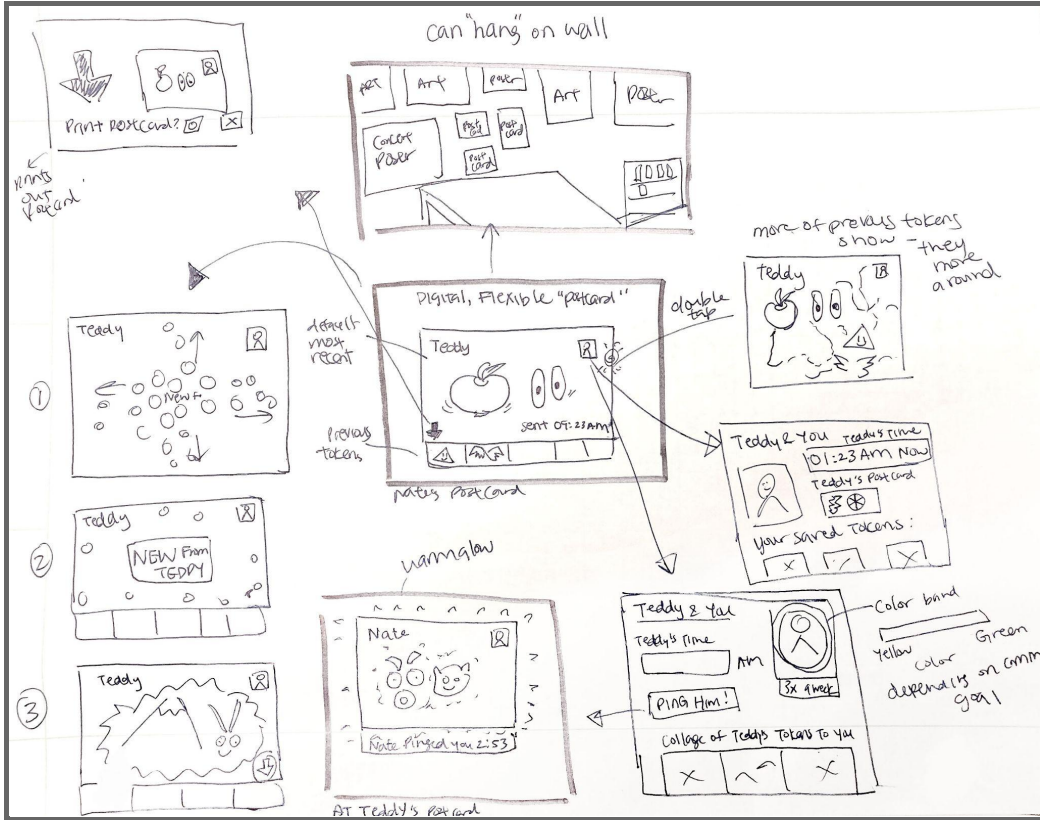
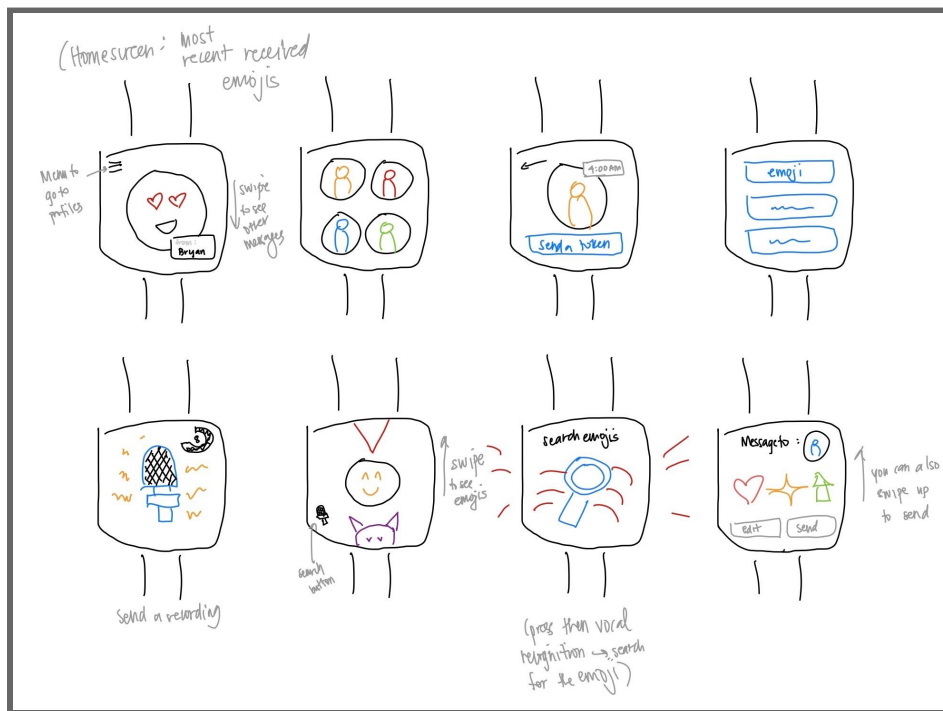**Figure 2.** An smart art frame to give your loved ones "real estate" in your new place.

Figure 3. A smart watch layout to explore simple and minimalistic design.

Figure 4. Augmented reality glasses to customize and design AR "buddies" for friends far away.
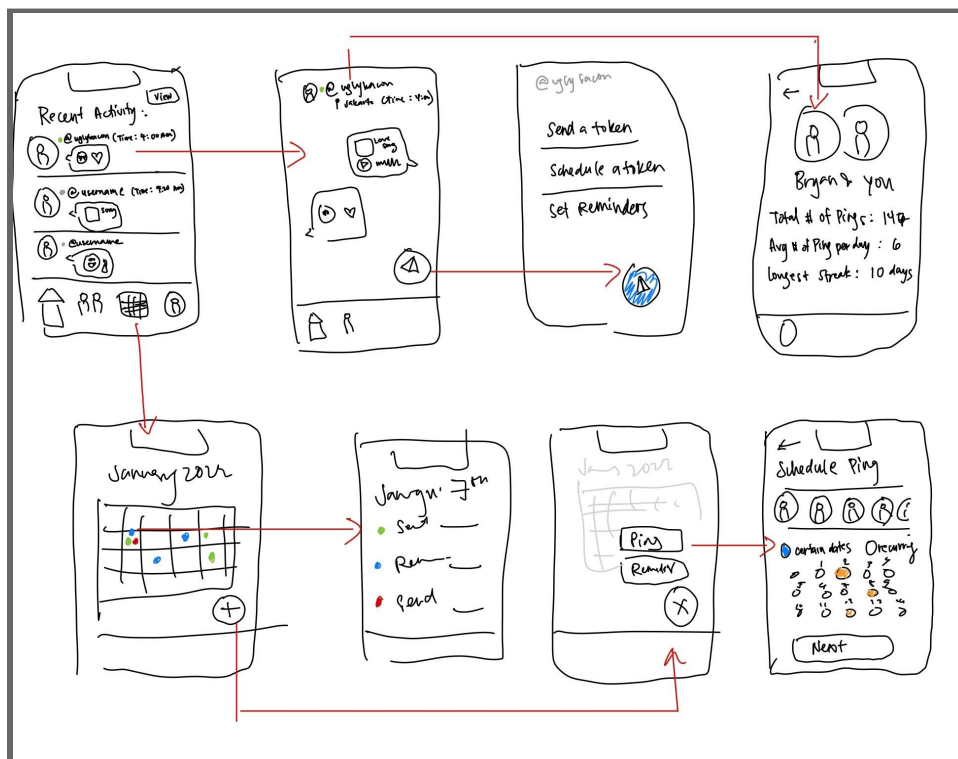

Figure 5. Mobile app realization of sending, scheduling tokens and viewing connection goals.
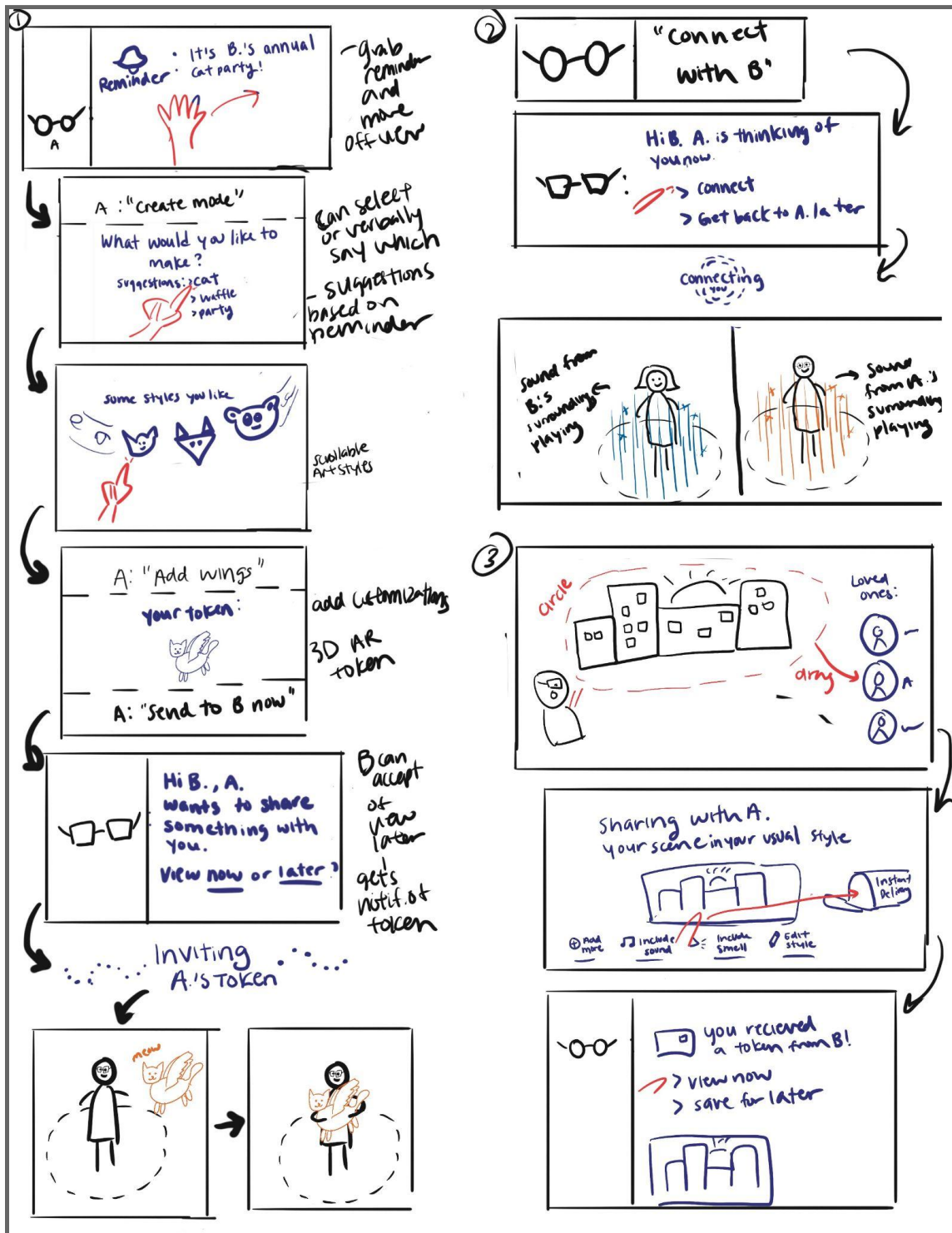
SELECTED STORYBOARDS

1. AR Smart Glasses

Figure 6. Augmented reality smart glasses to create customized 3D tokens and share moments directly with loved ones.

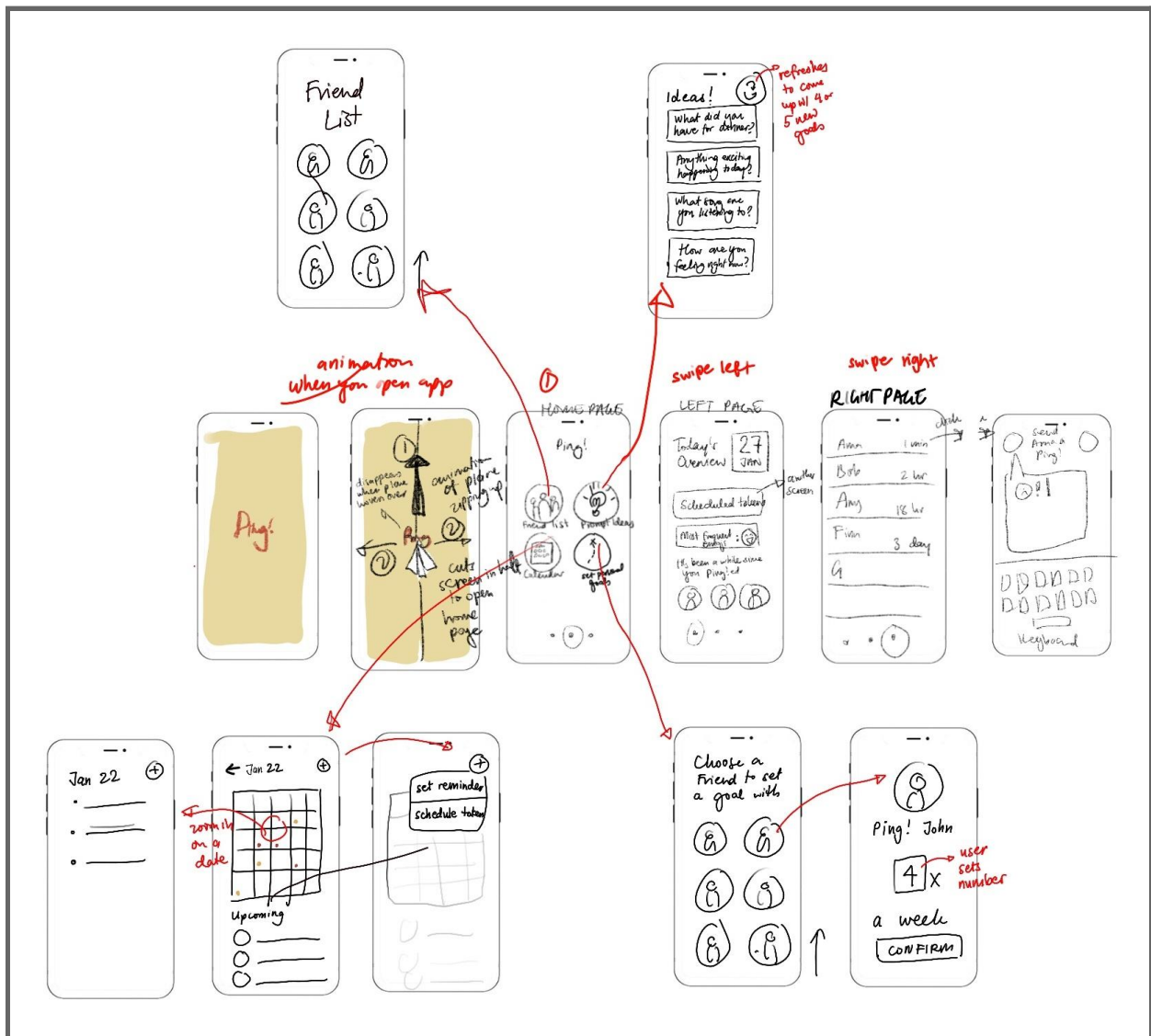| Pros	Cons
- Includes differently abled users (audio and visual capacity) - More personalization of tokens - Users can more seamlessly utilize features as they go about life	- Current technical capacity would make visuals clunky - Requires buying glasses (uncomfortable) - Greater learning curve to AR - AR visuals could be obtrusive to have

2. MOBILE APP

Figure 7. Mobile App storyboard to share and schedule tokens, and set connection goals.

Pros	Cons
- More familiar interface for users - High ceiling for implementation quality ➜ many existing tools and resources - Many people own smartphones - Allows for familiar visual, audio and haptic feedback	- Incorporates less seamlessly compared to AR as users will need to take out phone and open app - Less lifelike tokens

SELECTED INTERFACE DESIGN

REASONING

Ultimately, we selected our mobile app design for continued exploration. It is less demanding on users for onboarding as the AR concept requires new behaviors and a new device. From a feasibility standpoint, the AR concept posed challenges to user safety as it could be visually obtrusive. Additionally, we realized it was possible to incorporate the ideas inspired by the augmented reality medium (and other concepts) into a mobile app. We took our storyboard and revised it to the following functionality.

FUNCTIONALITY

Interface	Functionality/Description
Home Screen	Prominently displays three most recent received tokens. Access icons to send a token, share a moment, view friend list, and view connection goals. *Inspired by Fig 2 Smart Art Frame (prominently displaying most recent tokens) and Fig 3 Watch Weable (simple icons).*
Share a *Moment*	Takes you to page that lists your friends and their local times. Selecting a friend takes you to Share a Moment page where screen animation orbs and glows and you feel haptic vibrations. The friend will receive a notification and can synchronously experience the haptic interaction on their end. *Inspired by Fig 6 AR Glasses Storyboard*

Friend List	Takes you to your list of friends.
Garden of Goals	Takes you to a list of your existing connection goals (represented by height of plants) and ones you haven't started yet (represented by friend photo icon).
Edit/Start New Goal	Page to create/edit a new connection goal including number picker for times per week and confirm button.
Existing Goal Detail	Page to view status of existing connection goal and edit it.
Send a Token	Takes you to choose a friend list that displays their photo and local time. Selecting a friend takes you to create a token to send to that friend with emoji keyboard with your favorites pinned, send button and time selector for scheduling.
Sent Confirmation Page	Shows the friend you sent to and the token you sent.
Scheduled Confirmation Page	Shows the time the token is scheduled to send, the friend and the token.

TASK FLOWS

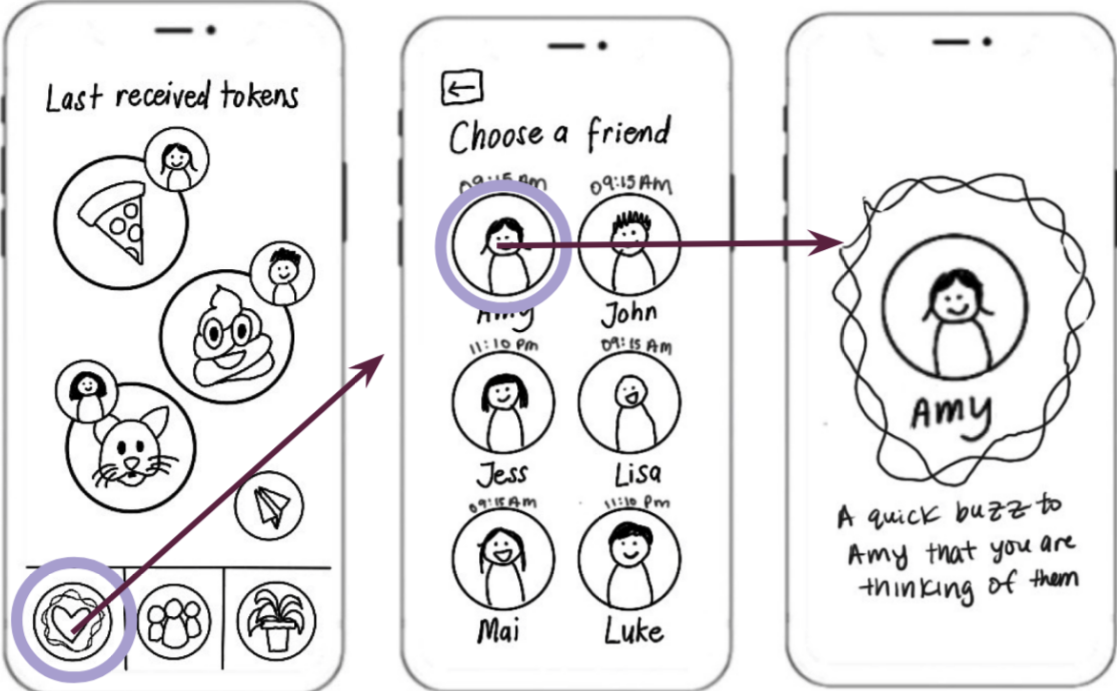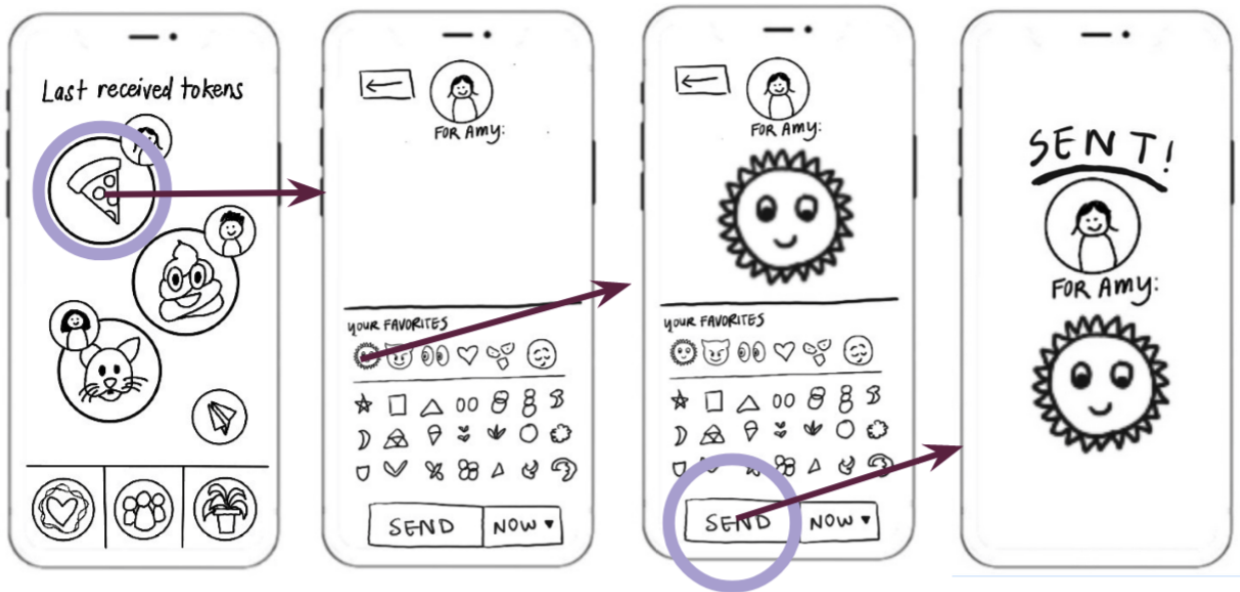**Figure 8.** Task 1: Flow for sharing a Moment with a friend (Amy)

Figure 9. Task 2.1: Reply to your most recently received token
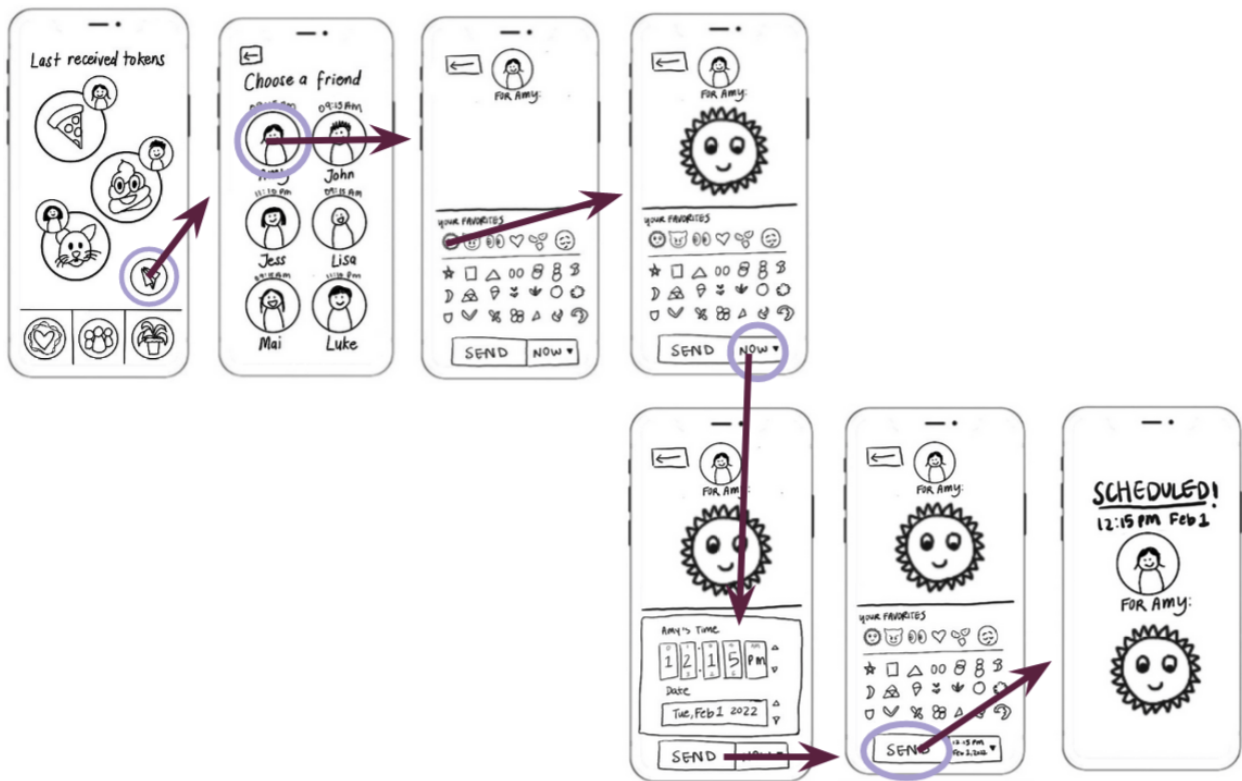
Figure 10. Task 2.2: Schedule a token to a certain time in your friend's timezone (Amy)
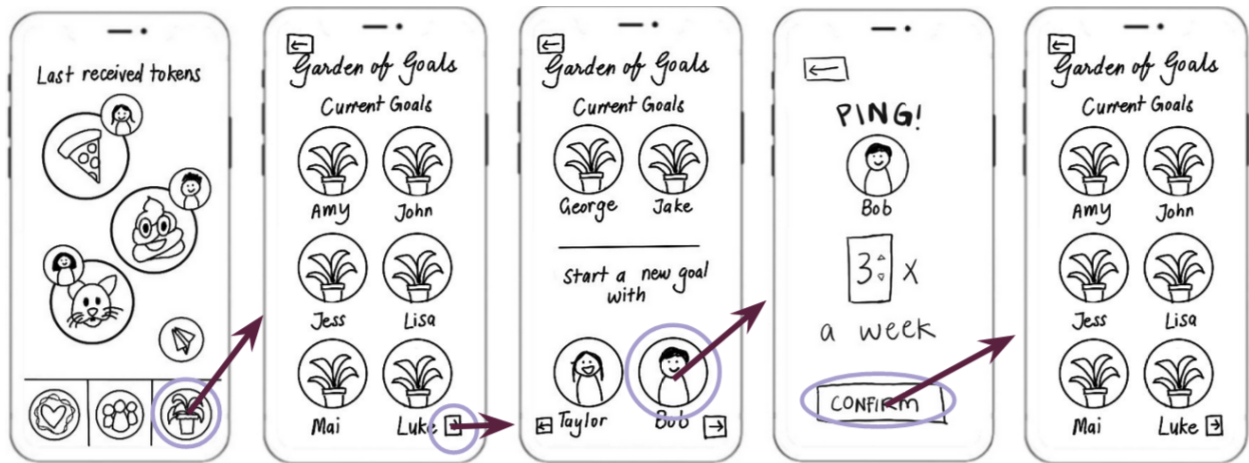
Figure 11. Task 3.1: Flow for starting a new connection Goal with a friend (Bob)
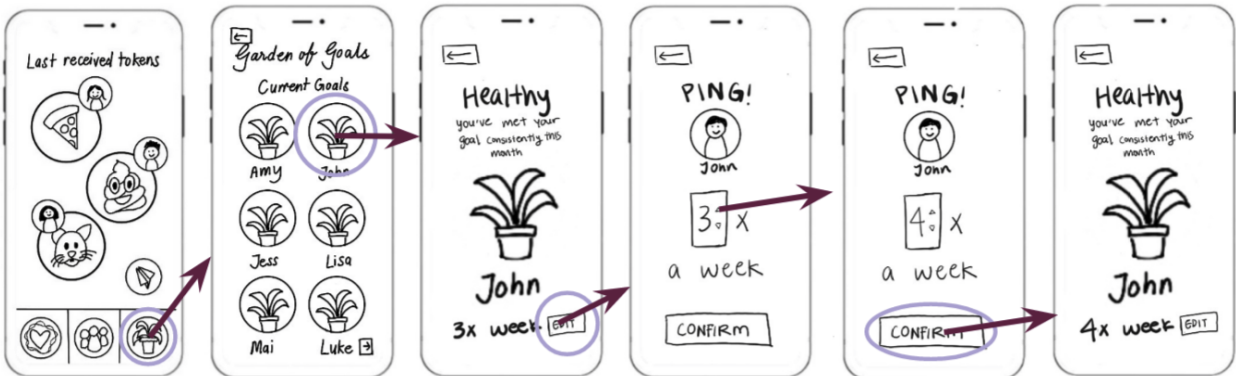
Figure 12. Task 3.2 and 3.3: Flow for viewing then editing a current Connection Goal (John) to increase it

LOW-FIDELITY PROTOTYPE

Our low-fi prototype enables users to (1) view last received tokens; (2) send & schedule tokens; (3) share a moment; (4) make connection goals; (5) view friend timezones; through touch and swipe input to move through visual screens. We aim to create an interface that foster connections that feel intimate unlike social media apps but without the pressure of continuity unlike messaging apps. We do this through ephemeral tokens and haptic interaction (shown in Fig 9 above).
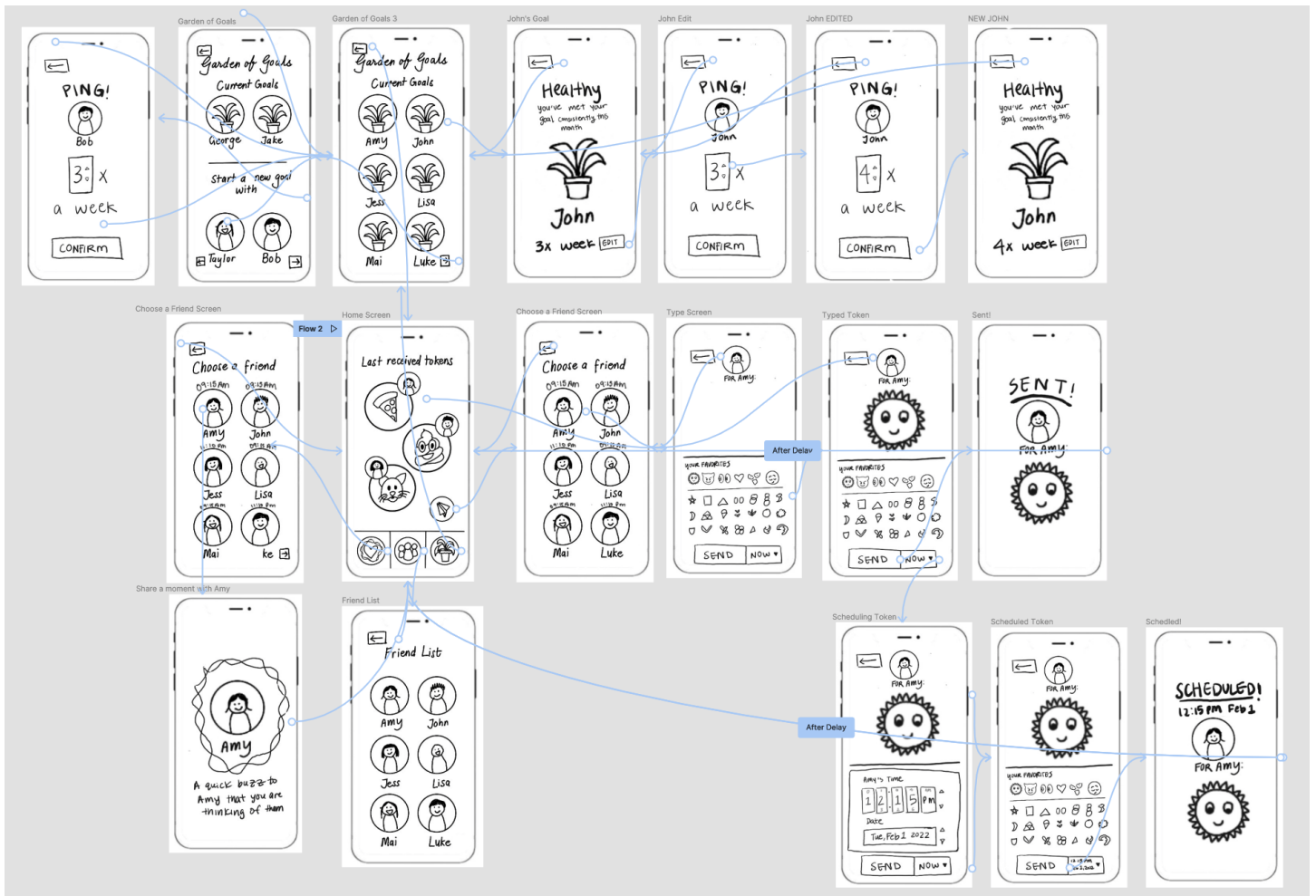
Figure 13. All screens of Lo-Fi prototype on Figma

TESTING METHODOLOGY

PARTICIPANTS

1. 14, female, has long-distance relationships
2. 22, female, international move away from home with 12-hour time difference
3. 23, male, moved cities away from family after 22 years of living with them
4. 50, male, oldest user

We approached teenagers and adults in their 20s currently in various forms of long-distance relationships because we felt they were most likely to download our app to stay in touch with their friends and loved ones. One older user served as a control test to see if our app could be convenient for older people to use. Participants were recruited through means including reaching out to a middle school alumni channel and contacting the relative of a co-worker.

TARGET USER GROUPS

1. Young people 12-25 with their close friends
2. Intergenerational relationships (eg. parent and adult or teen child)

ENVIRONMENT

Tests were conducted remotely over Zoom with participants sharing their Figma screens with us. The facilitator would guide unsure participants. While no compensation was provided, we expressed our sincere gratitudes to the participants.
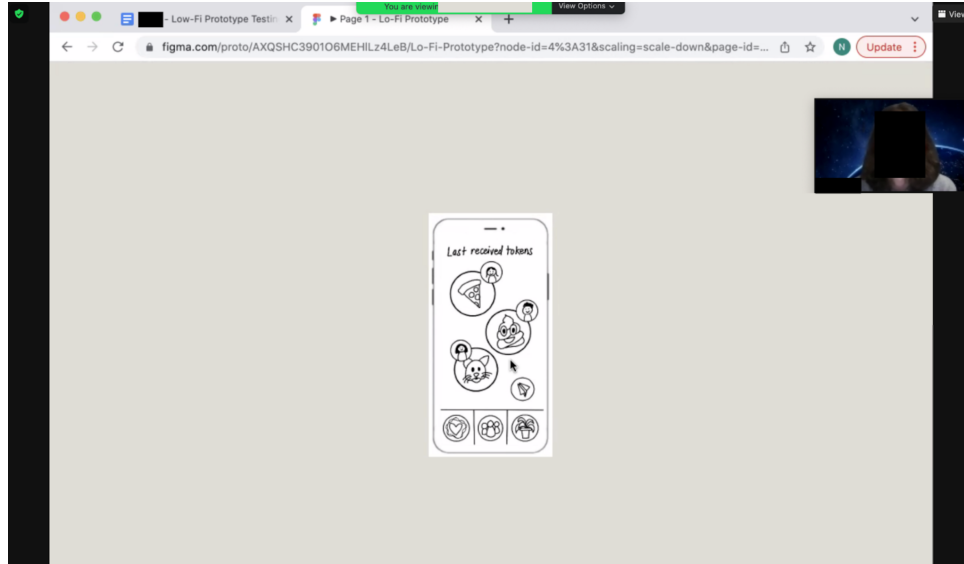
Figure 14. Zoom testing environment

TASKS

1. SIMPLE: "Share a Moment" with a friend.
2. MODERATE: Communicate you are thinking about a loved one through small and thoughtful tokens
   a. Subtask: Reply to your most recently received token
   b. Subtask: Choose a token to send at a specific time based on a friend's timezone
3. COMPLEX: Set and maintain connection goals with your friends
   a. Subtask: Set a goal to communicate with a friend 3 times a week.
   b. Subtask: View your communication progress with a friend
   c. Subtask: Increase your goal to communicate with a friend.

USABILITY GOALS

1. **Efficient**: we want the user experience and completion of tasks to be quick and intuitive and not require intense learning.
2. **Delightful**: we want the user to be able to feel the connection to their relationships through the interface of the app.

PROCEDURE

1. Introduce ourselves and put participant at ease before reading testing script.
2. Send consent form to fill in.

3. Provide big-picture overview of experiment and Figma prototype.
4. Emphasize feeling comfortable to talk their thought processes aloud and voice instinctive feedback.
5. Send participant link to Figma wireframe and ask them to share their screen.
6. Ask the participant to perform each task.
7. Upon completion, ask participants "Post-Test Questions" on script to gather feedback on participants' impressions, likes, dislikes, pain points, desires, and overall experiences. Ask follow-up questions when fruitful.
8. Thank participant.

OTHER TEST MEASUREMENTS

Success:
- User can complete tasks intuitively and verbally expresses delight
- User navigates screens with no external help, ie. we answer 0 usability/interface questions

Errors:
- User has trouble navigating to the right screens while completing a task
- User expresses confusion or frustration with specific elements of the interface (logos, buttons, etc.)

TEAM MEMBER ROLES

Facilitator/Greeter: Bryan/Ada
Observer/Notetaker: Mhar/Emily
Computer: Figma

RESULTS

WHAT WENT WELL
- Positive responses regarding app's simplicity—minimalist text and interfaces fulfill app's purpose
- Strong validation on our pain point of too stressed or emotionally exhausted to communicate in long forms with loved ones. Users loved the idea of small tokens and shared moments
- Younger users shared enthusiasm for app's purpose and novelty, understood icons and functions

- Users expressed that task flows were generally convenient and intuitive

WHAT DID NOT WELL
- All expressed confusion over vague "share a Moment with a user" task description, also required time to understand the "Moment" icon
- Older user did not understand icons
- 2 out of 4 users were unsure about which token was most recently received
- 2 users felt sending a token task flow could have fewer screens
- Users desired a search bar

SUGGESTED UI CHANGES
- Establish hierarchy of features on Home page
- Consider adding labels to Home Screen icons or having an alternativen menu that is label based rather than icon-based for older users
- Need a more clear way to "Start a new goal" or view "Current Goals"
- Declutter multiple screens by instead starting from a Friend List, choosing a Friend, *then* proceeding to other functions (Moment, Goal, Token, etc.)
- Implement confirmation for successful user actions (e.g. changing a goal)
- Improve UI of friends' timezones
- Moment feature could have visual cues such as motion to enhance delight and impact

DISCUSSION

We did not fully achieve our usability goal of efficiently sending a token with this prototype. Per our usability goals and key metrics, we saw a little visual and verbal frustration from our testers with the "composing a new token" flow. This was concerning because while sending a token is a Moderate task, it must be intuitive and convenient as a core function of our app. On the other hand, our usability goal of delighting users with the task experience certainly was fulfilled by the Garden of Goals. Participants verbally and visually expressed pure delights (giggles, smiles, "awww"s) by both the metaphorical plant design and usefulness of connection goals.

Unfortunately, the experiment could not reveal how the app could help facilitate intergenerational relationships, like that between a parent and teenage or young adult child, which is one of our target user groups. Due to the limited functionality of a paper prototype, we could not simulate actual usage between people of different ages, or even between people of the same age. However, two out of the four users mentioned wanting

to try this app with their parents without being prompted, and all four of our user testers mentioned wanting to use this app with close friends around their age without prompting.

Perhaps the most interesting insight of all, was different users' gravitation towards different features. For example, our youngest user, age 14, was absolutely delighted by our emoji token approach and was jumping to try that part of the app with her friends. Alternatively, the only task that our oldest user, age 50, truly enjoyed was the "Share a moment" concept. He could see himself using this to communicate to his wife and other loved ones throughout the day how important they are to him. An extreme tester, he wished that all of the other features did not exist and that the app would center and expand on this moment sharing concept. Our other two users, in their 20s, appreciated the Garden of Goals most. They strongly related to the pain point of finding time and energy to keep up with loved ones and forgetting to reply to long messages, and liked that they could regulate these goals themselves and see visual progress. Overall, the different task preferences could indicate that all of our app components provide something unique for different people within our intergenerational target user group. However, it could also indicate a need to narrow in on a more specific target user and enhance our feature set with them in mind.

APPENDIX

CRITICAL INCIDENT LOGS
Incident description and severity rating 0 (no issues) - 5 (usability catastrophe)

PARTICIPANT #1

Incident	Severity
Clicked immediately on pizza icon to reply to most recent token from amy	0
When doing scheduling token - clicks on message icon - easily gets to create a token	0
Doesn't know if they had to do anything to finalize setting time	2
Had to think about whether she had to go Amy's last received token or go to create a new message (referring to send icon)	2
Was confused about "now" at first	2
Immediately went to correct share a moment icon	0
Read what was on share a moment screen and thought she wasn't in right place and went back - confused by word buzz	4
Process of elimination to choose plant as goals	1
Thinks unprompted of metaphor of plants meaning growing relationship with friends – expressed joy and delight at this	0
Immediately knows to find Bob on next page of Garden of Goals	1
Easily set connection goal with Bob	0
Didn't seem sure that she had set the goal	3
Went to john very quickly and edited goal	0
Thought setting connection goals meant they were shared with friend	Food for thought
Expressed delight at the pizza and rat emojis ➡ to her it was discovering new emojis to use beyond the usual smiley face	Food for thought

PARTICIPANT #2

Incident	Severity
Tried to create an account at the very beginning	2
Successfully and quickly went to the friend list logo: "it's straightforward"	0
Got confused about the order of recently received tokens: "either top one or bottom one is the most recent one." "There is no time so I didn't know which one was last."	4
When sending a token to Amy, clicked schedule accidentally and couldn't return the button back to "send now"	4
When sending a token to Amy, she said: "I guess you can pick the friend list or the airplane button"	3
Scheduled a token to Amy quickly	0
Got really confused and needed assistance when asked to share a moment with Amy: "I don't know what a quick moment is, can you clarify?"	5 (not usability but for our general language /framing)
On how to get to the quick moment screen: "I am going to assume that it is not a message or a token. It doesn't look like a plant so it must be the heart" – guessed her way through the screen	1
"I'm going to hit the plant to 'grow' the relationship"	2
After setting a new goal with Bob: "why is it taking me back to the garden of goals?"	1
Edited connection goal quickly and successfully	0

PARTICIPANT #3

Viewed friend list quickly	0
Guessed that the bottom circle is the most recent emoji, rather than the top one	4
When sending a new token to Amy, he clicked on replying to a recently received token instead	2
Intuition to send a new message was NOT through the paper airplane but instead to click on friend list	5

Needed assistance to understand the paper airplane button to send a new message	5
When trying to schedule a token to Amy, he tried to change the time first before picking the emoji (which the prototype did not allow him to)	1
Hesitated to click the send button after clicking setting the scheduled time – assumed that confirming the scheduled time automatically sent it	3
Was confused on what "share a moment is"	5 (not usability but for our general language /framing)
"I'm new to the app so I'm going to click this random button" [to complete the "share a moment" task]	2
When seeing the orb screen, he wasn't sure what happened or whether the moment was shared with Amy – was confused after seeing the "moment" screen	5 (our prototype did not allow users to fully understand the haptic interaction of this screen)
Not entirely sure whether the plant symbol would lead to the goals page	4
Knew intuitively to click next page to add a new plant: "I dont see bob so i'll go to the next page"	1
After setting a new goal with Bob, he did not know whether the goal was set or not	4
Increased connection goal with John quickly	0

PARTICIPANT #4

Incident	Severity
Initial reaction: curious about the plant, not sure what the "squiggly" on the wavy lines around heart logo means	1
Found friend list quickly and easily	0
Goes to send icon to reply to most recent token	1

Didn't think it was intuitive to hit the send button first then choose a friend then create token (took a while before clicking on send button)	3
Thought homepage was a group chat or a message thread	4
Mentioned preferring to see the people who sent him a token as opposed to the token (in terms of relative size on the homepage)	1
Wasn't apparent to him that the plant icon leading to garden of goals was to create a connection goal	3
Had trouble finding bob since creating new goals was on second page	3
Asked if it was possible to change the communication goal to by month	1
Felt there wasn't a confirmation of goal change	3
Expressed not wanting to make goal with friends since it felt like a chore - but mentioned potentially useful for setting goal with mom	1
Found moment through process of elimination	1
Recognized that moments was animation waves	0
Confused what the 9:15 am above profile icons were	5
Wasn't clear that he should hold finger on share a moment	2
Very passionate about how great share a moment feature is after hearing about haptic feedback	0

BLANK CONSENT FORM

Consent Form

Pings's prototype is being produced as part of the coursework for Computer Science course CS 147 at Stanford University. Participants in the experimental evaluation of this prototype provide data that is used to evaluate and modify the interface of Ping. Data may be collected by interview, observation and questionnaire.

Participation in this experiment is voluntary. Participants may withdraw themselves and their data at any time without fear of consequences. Concerns about the experiment may be discussed with the researchers (Bryan, Emily, Mhar, Ada) or with Professor James Landay, the instructor of CS 147:

> James A. Landay
> CS Department
> Stanford University
> 650-498-8215
> landay at stanford dot edu

Participant anonymity will be maintained by the separate storage of names from data. Data will only be identified by participant number. No identifying information about the participants will be available to anyone except the student researchers and their supervisors/teaching staff.

I hereby acknowledge that I have been given an opportunity to ask questions about the nature of the research and my participation in it. I give my consent to have data collected on my behavior and opinions in relation to the Ping's research. I understand that I may withdraw my permission at any time.

I give consent to be videotaped during this study:
___Yes   ___No
I give consent to be audiotaped during this study:
___Yes   ___No
I give consent for video or audio recordings from this study to be shown to people not directly involved with this research during/in class, seminars, reports, or scientific presentations.
___Yes   ___No

Name _____

Participant Number _____

Date _____

Signature_____

TESTING SCRIPT

Hello! Thank you so much for agreeing to participate in our testing study.

We are a group of students from Stanford University and we are currently making an app for our human-computer interaction class.

Our app is called **Ping!** and it is designed to help maintain all different kinds long distance relationships. We want to ease the process of letting loved ones know you are thinking of them through these small "tokens" or "Pings" that you can send and receive. These tokens are essentially a string of emojis whose meaning you assign—an inside joke, a food you ate, and more. We don't intend for this to replace quality conversation. These are for moments when you're too busy or drained to reply a long text or have a phone call, but want to conveniently let your loved one know you're thinkign about them.

We are going to send a link to a digital version of our prototype which we will develop further later on. We ask that you share your screen and feel free to navigate the screen as if it was an actual app.

During this interview, we will ask you to complete a few tasks. As you do this, please talk out loud your process in navigating our app, as we would like to use your experiences with our prototype to improve upon our interface. Please tell us any elements that stand out to you, what you like or dislike about the interface, and just generally what you are thinking about as you go.

Here are your tasks:
1. View your friend list. [SIMPLE]
2. Reply to your most recently received token. [SIMPLE]
3. Send a sun token to Amy [MODERATE]
   a. Amy is currently in Asia. You want to let her know you are thinking about her despite time zone differences. Schedule a Sun token to Amy for 12:15 PM in Amy's timezone. [MODERATE]
4. Share a quick moment with Amy. [SIMPLE]
5. You want to strengthen your relationship with Bob. Set a goal to communicate with him 3x a week. [COMPLEX]
   a. You feel like you are not talking to John enough. Increase your goal to communicate with John. [COMPLEX]

Thank you so much again for your time! You can contact us any time for questions.

Post-Test questions:

INTERFACE QUESTIONS:
- What were your first impressions of the app?
- Are there any parts of the interface that stood out to you?
- Was there a particular moment in navigating the app that you thought was confusing? / Are there any elements of the interface that you thought were confusing?
- Do you have any feedback for our interface overall?

APP CONTENT QUESTIONS:
- As a user of the app, how did this app / experience make you feel?
    - OR how would receiving these tokens make you feel? How would sending these tokens make you feel?
- Did you have a feature that you would be most interested to see?
- Did you feel that the garden of goals would help you communicate more consistently with another person?
- What other features would you like to see in this app?

Ask any follow-ups as necessary or fruitful.