12/11/2013

Sociably

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SI 689- Social Interaction Experience
Fall 2013

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Executive Summary

This report documents the research and design implications used to inform the overall design of a proposed system, Sociably: a mobile application for helping individuals achieve social health and wellness. In what follows, we describe the primary research methodologies used and the key findings and results used to support the design, as well as document the most prominent interactions and features of the application. Furthermore, the domain of tracking social interactions to support overall sociability has thus far been limited — despite the fact that there has been extensive studies surrounding the idea that social wellness tends to contribute to happier and healthier individuals (Moturu et. al. 2011). This paper aims to bring some new perspectives to the subject.

The objective of Sociably is to help individuals achieve and maintain social health and wellness by enabling them to understand and manage their social selves. Sociably takes the form of a wearable, sensing wristband coupled with a mobile phone application. In order to allow individuals to first better understand their social selves, it leverages the use of information visualizations, which are created based on a combination of body data (voice biometrics and geophysical location) and user inputted information (tags and identification of social groups). These visualizations inform the user of her social behaviors and patterns, thus enabling her to reflect upon her social habits and determine if any changes are necessary. To further aid understanding of social self, Sociably supports social comparison. If the user chooses, she will be able to compare and evaluate her social patterns against those of a larger community of Sociably users. Finally, Sociably helps users manage their social behaviors by supporting the act of goal setting: the system enables a user to set and track certain social-related goals to attain a level of social balance that the user desires.

Primary research methods used to guide design decisions involved a diary study along with follow-up interviews. Both of these studies were developed with the intent of gaining an understanding of how people intuitively define and typify their social interactions. Insights as to people's overall mental models regarding social interactions are invaluable towards designing a system to support such mental models. Other research methods included a literature review into background research in the area of

tracking social interactions, and running iterative usability tests on the design itself to investigate its effectiveness.

The conducted diary study helped us understand the common notions and perceptions among people when it comes to classifying, categorizing and tagging their conversations. Post diary studies, the participants were interviewed to understand their artifact more clearly. We then drew patterns from the whole process (diary study + interviews).

The key findings gleaned from the diary study and interviews are as follows:

1. All participants define face-to-face interactions as "social interactions", while some tracked phone, text, and various other online interactions.
2. There exists a gap between people's perceived social interactions and actual social interactions.
3. People think about, categorize, and reflect upon their social interactions in vastly varied ways.
4. People are interested in seeing the "bigger picture" (with regards to their social selves) rather than granular details about their social interactions.
5. Overall, there appears to be genuine interest in a tool that might help an individual understand his/her social interactions.

Key Design Implications

Based on these findings, we generated concrete design implications that will support user goals and improve overall user experience. The major implications are as follows:

1. Focus on designing to support face-to-face interactions.
2. Design for flexibility when possible.
3. Provide four default visualizations for the new users as a starting point.
4. Facilitate the ability for users to add notes and annotations various interactions.
5. Information presented should depict broad strokes and big picture views rather than delving into granular details.
6. Support users in goals setting and progress tracking.

Introduction

Social health and wellness "refers to one's ability to interact with people around them. It involves using good communications skills, having meaningful relationships, respecting yourself and others, and creating a support system that includes family members and friends" (University of California, Riverside, 2012). Social health is one of the most important forms of health today. According to the University of California, Davis' "Mind and Body Wellness Challenge," "social wellness is very important to overall health" (University of California, Davis, 2013). Furthermore, research by Motoru et. al. (2011), states that "we find that individuals with lower overall sociability tend to report poor mood more often...It has been noted that greater social cohesion tends to result in healthier and happier individuals." However, monitoring social health is often ignored, as people either do not have time for it or do not realize the adverse effects of poor social health.

It is clearly evident that social interactions indeed have great effects on a person's overall health, so there is a need for individuals to maintain optimum balance in this sphere. However, currently, there seems to be a lack of available, commercial applications that helps individuals achieve and maintain social health. Therefore, we began designing Sociably as an application to fill that need.

In addition, this project is our entry to the Student Design competition at CHI (ACM CHI Conference on Human Factors in Computing Systems) 2014. This year's theme for the competition is "One of a CHInd", which focuses on using body data to inform people about their current physical state. "Quantified Self" is a movement to incorporate technology into data acquisition on aspects of a person's daily life in terms of inputs (e.g. food consumed, quality of surrounding air), states (e.g. mood, arousal, blood oxygen levels), and performance (mental and physical)(Wikipedia, 2013). With Sociably, we aim to sense individual's social interactions through the use of voice biometrics and geophysical location (see Non-Social Requirements), thus providing them with useful patterns that they might extract value from over a period of time.

However, in order to address the problem of improving social health and wellness, we first needed a more in-depth understanding of social interactions. We sought to gain a better understanding of

how people typically think about, categorize, and reflect upon their social interactions, as well as what methods the a system should employ to support those mental models. The questions were:

1. How do individuals define, categorize, and group their social interactions?
2. What sorts of quantitative measures will best inform meaningful social patterns?
3. How shall the system support/facilitate/motivate changes in social patterns and behaviors?

An understanding of these three primary research questions were and will be invaluable towards designing a successful system to support social behaviors. With our first research question, we not only sought to understand how individuals perceive categorize, tag or classify the social groups around them, but we also sought to understand what most people even considered as "social interactions." This helped narrow down the project's scope to include only those kinds of interactions that people typically considered "social."

The answer to the second research question informs what types of information should be taken into consideration to generate various social patterns and information visualizations. In other words, what attributes about social interactions are meaningful and important to different people? The solution to this question addresses whether there are any commonalities or trends among the types of information people wanted to see about their social interactions.

Finally, the third research question refers to the motivations and incentives needed to keep users engaged with the system. We wanted so see how people go about changing social habits, so that the system could provide them valuable information. The system should be able to help the users assess their progress, and set various targets and achieve these targets.

Methodologies

To answer the above research questions, we followed a thorough research process which included four major phases: a literature review surrounding methods of social interaction tracking as well as past research on the topic, a review of existing, comparable body data systems, a diary study, and interviews.

Literature Review:

A literature review was conducted in order to understand the previous work that had been conducted in the sphere of quantitatively measuring social interactions. There have been several studies and products developed in the past. For instance, Aharony et. al.'s "Friends and Family" study involved deploying a pervasive computing system within a residential community of 130 adults over a course of 15 months to study the social behaviors of the population. Olguín et. al. developed the "Sensible Orb" to help groups of individuals measure conversation dominance (51). However, most of the technology used in these studies are limited in terms of implementation: the "Friends and Family" study required an extensive computing system to be installed throughout a community, and the "Sensible Orb" is not a mobile device. None of the existing technology proposed a convenient, mobile system fit for an individual to carry around for everyday use. Furthermore, past studies were focused largely on tracking individual social behavior from a social perspective: to better understand social networks, cooperative work, etc. Few studies focused on presenting this data to individuals, or how this knowledge might benefit those individuals.

Perhaps the closest technology to the proposed system, Sociably, is the sociometer (also known as sociometric badges). The MIT Media Lab's Human Dynamics Group developed the sociometer to be a portable, wearable device designed to track various aspects of a the wearer's social interactions by utilizing various data about the wearer's position and contextual information based on accelerometer, GPS, and other systems in the device (Choudhury and Pentland).

There are, however, certain limitations to the sociometer. First, the form factor of the device is bulky — it is approximately the size of a cellular phone. This bulk may be inconvenient for a user to wear extensively, especially since most people nowadays may already carry around multiple portable devices (such as cell phones, laptops, and tablets). Any sort of additional device should take this into consideration and try to avoid further inconveniencing a user with yet another device to keep track of. Second, both the parties involved in the conversation must be wearing the device. Hence, there is no way for users to add their own contacts and track conversations with people who do not have the device. Third, the sociometer does not help the users analyze and assess themselves to make changes in their social interaction structures. Sociometers are primarily used infer structural and dynamic relationships

that exist in groups of people, such as "collective patterns of behavior...identifying social affinity among individuals working in the same team" rather than the social patterns of individuals ("Sociometric Badges").

Existing systems review:

We also looked into other commercial systems that leverage body data to better inform their users and engage them over a period of time. Instances of these systems included FitBit and the Nike Fuel/Nike+ system: both are popular wearable devices designed to help individuals track and monitor physical activity and sleep patterns. It was interesting to note as to how the users used these systems and how in turn the system kept the users engaged over a period of time. What were the specific mechanisms in terms of different visualizations, rewards, benefits, etc that were used in these systems to keep the users engaged with the system over a period of time. For instance, both Nike+ and FitBit use a leaderboard to help users compete and maintain a reputation in the system. What sort of visualizations and data the users wanted to see and made more sense to them was also interesting to look at.

Furthermore, we investigated systems designed to help users set, track, and monitor goals. While both FitBit and Nike Fuel included goal setting as a feature of their systems, we also investigated Lift: a web and mobile-based service designed for the sole purpose of helping users achieve goals, both big and small. Nike+ also uses clean progress bar like visuals to depict the users goal progress. An understanding of such existing systems allowed us to better evaluate the effectiveness of Sociably's design.

Diary Study

A diary study and interview-based investigation were designed to gather insights about people's perceptions of social interactions. Because people do not consciously think about their social interactions, it is extremely difficult to gather this type of information through interviews alone. We wanted to know how people think about their social interactions in the natural environment of their everyday lives. Hence, we asked participants to keep track of their social interactions in an artifact form (which was later collected) as they occurred throughout the course of 24 hours.

The prompt of the diary study was purposefully left open to participants' interpretations. The instructions simply asked participants to track their social interactions, without specifying what counted as a social interaction, what types of information they should note down, or how they should track this information. It was important to let the participants decide what sorts of information was meaningful for them, rather than being led towards preconceived notions. It was also important that the form that the artifacts we asked them to create was left open to imagination, as we were curious to understand what natural ways participants might organize the information they gathered.

The sample population for this study consisted of an array of different demographics, which helped infer the social interaction patterns of a larger population. A list of characteristics were created, including occupation, nationality, and gender, that attempted to reflect the diversity of users Sociably hopes to support. We then sought out a number of people who fell into different categories within those characteristics.

The recruitment process involved sending a call-to-action email sent across numerous University of Michigan mailing lists. Based on the responses to the email, the candidates were chosen to reflect a diverse demographic make-up. In the end, ten participants were chosen for the diary study. They included five males and five females with a mixture of occupations: five, full-time college students, four working professionals, and a one individual who worked part-time from home. They represented a distribution of different careers aspirations, ages and three different nationalities. Each participant was compensated $25 for their efforts.

Interviews

Prior to conducting the interviews, artifacts were collected from the participants and studied carefully. Certain interview questions were then modified and tailored to address each unique artifact to obtain a more thorough understanding the document.

Shortly following each diary study, semi-structured, follow-up interviews were conducted with the participants. The semi-structured format was used to accommodate for questions that arose from each participant's notes. The interviews were conducted in pairs with one interviewer and one note taker.

These roles rotated and all team members had the chance to be an interviewer and a note taker. The notes formed a vital source of questions and information for the interview.

The interview questions were designed to help us further understand the artifact that participants had created while completing the diary study. It was imperative gain insights into why a participant chose to use certain methods to detail his/her social interactions, what s/he chose to document, as well as his/her opinions about completing the overall activity. This way, we were able to understand what sorts of schemas participants used to organize his/her social interactions, which attributes regarding social interactions were important for participants, as well as whether or not they gained any overall takeaways about themselves over the course of the exercise.

Data Analysis

Following each interview, our team utilized a bottom-up procedure to analyze the gathered data. Our team first analyzed the data by creating concise notes to distill essential information gathered from interviewees (also known as affinity notes) and identify key findings. We also identified issues in the interview process and adjusted our questionnaire accordingly for each subsequent interview. Following the creation of affinity notes, we grouped and coded these notes according to larger categories in order to identify underlying trends. Through several rounds of re-grouping and re-organizing, we were able to draft key, high-level findings and distinguish patterns in the data provided by the users. These high-level findings provided insights as to what might be the most important features that users might expect from a system that tracks social interactions, as well as what might not be considered important. The data also provided a birds-eye view as to what kind of social interaction patterns the users were curious to know about their social selves.

In addition, we constructed personas based on seven characteristic continua derived from the analysis of interview data: overall social nature, need for social adjustments, mobile phone expertise, occupation, family structure, prioritization of work vs. life, and diary keeping habits. We created three distinct personas by spreading their characteristics across these seven continua. We then developed scenarios we felt to be typical of the interviewees and expressive of the total user group. Both the

personas and scenarios gave a clear vision of how the system might be used by different users under different contexts.

Finding and Design Implications

Summary of Results

Based on the data collected and analyzed from the ten diary studies and interviews, we discovered that the primary way participants defined "social interactions" was those that occurred face-to-face in the same physical space as others. Furthermore, we found that people held vastly different mental models and schemas when it came to mentally organizing their surrounding social spheres, and were also largely unaware of their day-to-day social behaviors. When it came to reflecting upon these social behaviors, most were uninterested in granular details and more interested in the "big picture." Overall, we received positive feedback and excitement about the proposed system.

The following findings are presented in order of importance.

Finding 1

All participants define face-to-face interactions as "social interactions", while some tracked phone, text, and various other online interactions.

Evidence

In the diary study, participants were asked to track their social interactions, though the definition of what exactly qualified as "social interactions" was left open to subjects' interpretations, allowing them to define this term for themselves. P2 stated that she interpreted "interaction" as any time she spoke or acknowledged someone. P6's definition of social interactions "[revolves] around...friends you're doing activities with." According to P6 and P3, talking to someone online, emails, texts, and Facebook, were all form a social interactions to consider.

Every artifact created by participants as a means of tracking their social interactions contained information about face-to-face interactions, with a few containing scattered notes about phone calls, texts, and emails. It seems as though, while emails and other forms of online communication definitely counted as "interactions," these sorts of interactions either happened

too quickly to write down, or were perceived as a different "type" of interaction compared to face-to-face ones and therefore left out. For instance, P2 pointed out that she included exactly two online interactions in her artifact: one email and one video chat. To P2, while emails and texts "definitely counted as interactions," they were "too brief to count." P7 made an important distinction regarding face-to-face interactions versus other forms of online or phone interactions. For P7, a real-time "feedback loop is really important", as well as the ability to note "[the other person's] real-time reaction," and therefore did not keep track of interactions that lacked these two components.

Design implications

- The system should initially focus on supporting face-to-face interaction tracking, since the data shows this to be the most prominent type of interactions as identified by the participants themselves. Face-to-face interactions are therefore most indicative of contributing to overall social health.

Finding 2

There exists a gap between people's perceived social interactions and actual social interactions.

Evidence

During the interviews, participants were asked whether they learned anything about themselves by completing the diary study. Responses varied widely:

P2: "This confirmed that I am really a social person."

P2: "Am I a morning person?"

P3: "I didn't realize how social I actually am."

P6: "Am I a passive conversationist, or an active one?"

P4: "How many quality conversations am I having?"

Such comments and questions suggested that participants were largely unaware of certain social behaviors they exhibited, and completing the exercise and seeing tangible evidence of their social patterns brought some of those behaviors to light.

Design implications

- Bridge this gap by providing users with information tailored towards helping users raise their self awareness regarding their social selves.
- Support hypothesis testing via goal setting and progress tracking

Finding 3

People think about, categorize, and reflect upon their social interactions in vastly varied ways.

Evidence

When comparing participants' artifacts, there were rarely any solid, overarching details regarding social interactions that everyone noted down and deemed as important. Each artifact contained a diverse combination of details which mapped uniquely onto the individual completing the exercise. Even when more than one participant noted down the same thing in their artifact, interviews revealed that each participant perceived the importance of such details quite differently. For example, P5's interactions revolved primarily around the locations where she was conducting those interactions. To P5, her artifact would have been useless without location data. P3, on the other hand did not include any sort of location data because it "did not occur to [her]" and simply was not an important facet of her social interactions. For P8, keeping track of her social interactions was useless if she was not able to record what mood she was in during and following each conversation. Despite such differences, however, some broad (if somewhat tenuous) trends did emerge from the data:

Overall, every participant agreed that these dimensions were important to them:

- **Content of conversation:** Participants wanted to note down "what" they were talking about in each conversation so they could reference this information later. This information was not recorded in the artifacts due to privacy concerns.
- **Who they were talking to:** Participants kept track of the other person(s) they were engaged with in each interaction. The "who" includes both individuals as well as groups of people.

The following dimensions varied in importance among participants:

- **Time:** A timestamp of when a conversation took place.
- **Quality:** Several participants indicated very strongly that they wanted to remember which conversations were deemed good, "quality conversations" versus superficial, surface-level conversations. P4 even stated that quality conversations were really "the only things that matter[ed]" over all the other "quantifiers", such as time and duration of conversations.
- **Mood:** How a participant was feeling during and after an interaction was mentioned by a couple of participants.
- **Activity:** What a participant was doing or engaged in was indicated as an important contextual factor with respect to recalling specific interactions. For instance, P6 mapped his artifact around his schedule for the day — the activities he had planned dictated what interactions he would be engaged in.
- **Location:** This refers to where an interaction took place.

The following patterns arose as what most participants wanted to know about their social selves:

- **Work/life balance:** Participants were curious to see how their interactions were allotted between work-related conversations versus all other conversations outside of work.
- **Formal vs informal conversations:** Participants also indicated wanting to see how many "formal" interactions they had (business meetings, interviews, talking with professors, etc) compared with informal interactions (casual conversations with friends, family, etc).
- **Duration of conversation:** This refers to how long a conversation lasted. Several participants mentioned the desire to see how many short chats they had versus longer talks.

Design Implications

- Design for flexibility and customization wherever possible.
- Default visualizations to show users when they first start using the system should cater to what most participants identified as important or interesting.

- Allow for user inputted annotations and/or tagging with respect to specific conversations since recording content of conversation via the application would be a violation of privacy.

Finding 4

People are more interested in seeing the "bigger picture" (with regards to their social selves) rather than granular details about their social interactions.

Evidence

Every participant indicated that seeing data from the one day duration of the study was inadequate for seeing social patterns — participants said they wanted to see data from at least a week, or even a month. According to P2, "the more data, the better." As for P1, he thought that the diary study should have lasted at least week, since his schedule "repeats after a week."

Participants also began to ask bigger questions about themselves, "Am I a morning person?" "Do I save enough time for my husband?" "Am I keeping up with people I want to be keeping up with?" Such questions refer to higher level takeaways, rather than the finer-grained details of day-to-day interactions.

Design implications

- Default timeframe view for visualizing information should be by "week", with options to view data by "day," "month," or "all."
- Information presented should depict broad strokes and big picture views rather than nitty gritty details.

Finding 5

Overall, there appears to be genuine interest in a tool that might help an individual understand his/her social interactions.

Evidence

When debriefed about the study, almost all interviewees became quite excited after understanding what we were hoping to accomplish. Quotes included, “WOW!” P4, who had been quite terse and stoic throughout the entire interview process, suddenly became very animated after being debriefed about what Sociably was trying to accomplish. He said, ““That would be awesome if there was magical thing that could [display information about my social interactions] for me.”

Design implications

While this finding does not inform any specific design implications, it does provide evidence that both research and design are moving in a positive direction.

System Design/Prototypes

System overview

The interactive system, Sociably, was designed based upon the aforementioned research, findings, and design implications, to best help users understand and manage their social selves. Sociably involves a wearable wristband device coupled with a mobile application. The wristband serves as the sole sensing and information input device (see Non-Social Requirements). The data collected by the wristband then gets transmitted to the mobile application, where users are able to see their social interaction data via a graphical user interface.

Design strategies

The strategies used to achieve the goal of helping users both understand and manage their social selves stems from a combination of CHI competition requirements as well as those derived from or confirmed by research. These strategies include the use of body data, information visualizations, social comparison, and goal setting.

Sociably leverages two types of body data to gather information about a user's social interactions: voice biometrics and geophysical location. Voice biometrics serves two purposes: speaker recognition and social interaction feature extraction. According to the work of Choudhury and Pentland (2002), vocal data may be used to sense features of face-to-face, physical, social interactions, such as "frequency and duration of communication". The work of Olguín et. al. (2009) involved extracting speech features to capture social signals, such as interest, excitement, etc. As research in this area continues, it may be assumed that such methods of using voice biometrics to derive social information will only become more sophisticated and refined. Voice biometrics, combined with geophysical location, allows Sociably to infer certain contextual factors about the nature of a user's social interactions, thus giving the user a more accurate and interesting picture of her social interactions.

In order to translate voice biometrics and geophysical location data into forms that are understandable to the average user, Sociably utilizes information visualizations. Through the use of

information visualizations, Sociably presents the raw data in a way that is meaningful to the user so that she may better understand her social self.

To further help a user understand her social self, Sociably supports the concept of "social comparison." According to social psychologist Leon Festinger's "Theory of Social Comparison Processes" (Festinger, 1954), there exists, in all humans, a drive to evaluate her opinions and her abilities, often against other individuals or groups of individuals. This drive for evaluation acts in a manner which affects behavior (Festinger 1954). Therefore, to help users manage, and possibly change, behavior, Sociably provides a platform where users may compare certain social dimensions against similar others.

Moreover, Sociably uses goal setting and progress tracking to support the user once she has decided to change or track her social behavior. The support for goal setting is multi-faceted, stemming from comparative analyses of comparable body data applications, as well as data gathered from interviews following the diary study (see Finding 2).

Mobile application features

The mobile application portion of Sociably is the primary mode by which a user interacts with the system. The following section outlines the five main feature sections of the application: Dashboard, Profile, Social Comparison, Goals, and People.

Dashboard

The dashboard houses the majority of information visualizations pertaining to a user's social interactions. Taking into consideration that each person may typify her social interactions in vastly different ways (see Finding 3), the dashboard utilizes a flexible card system, allowing the user to customize what types of information visualizations she sees to only those containing social information that she finds interesting or relevant.

However, despite the fact that everyone typifies her social interactions differently, Sociably provides four default visualizations for first-time users. These default visualizations were created based on overarching trends identified from the diary study and follow-up interviews. The default visualizations

are: work/life balance, breakdown of interactions with respect to social groups, breakdown of interactions with respect to individuals, and top five tags (based on user-input).

Figure 1 Work/ Life Balance

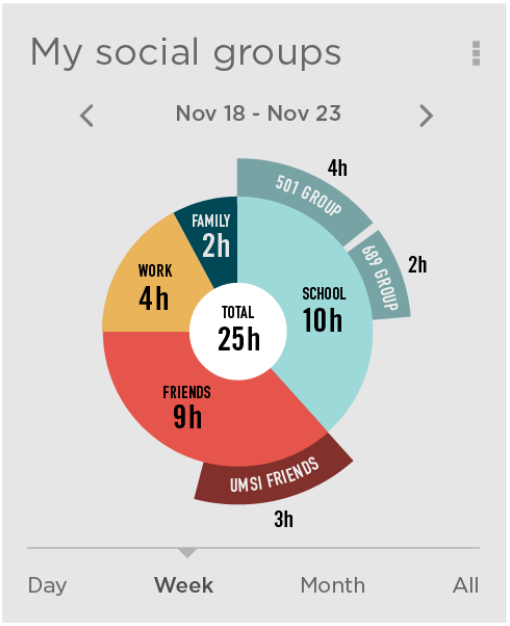

Figure 2 Breakdown of Social Groups

Figure 3 Top 5 tags

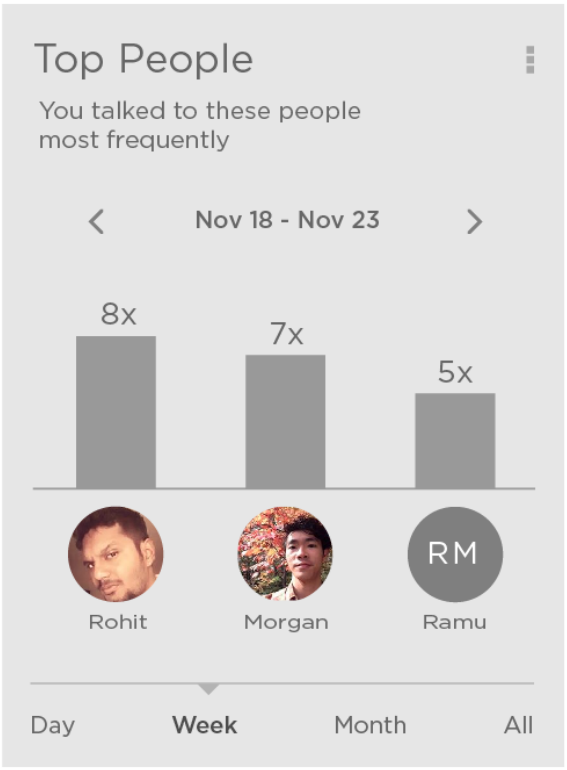

Figure 4 Breakdown of Interactions wrt individuals

Profile

Each user of Sociably has her own profile within the system, visible only to herself. Slightly different from the average "profiles," where users are able to input their own information about themselves (usernames, avatars, etc), Sociably presents users with a "social summary." A social summary is a short, concise summation of the user's social behaviors and patterns based upon aggregated data collected by the system. Essentially, the social summary presents the user with a picture of her "social self."

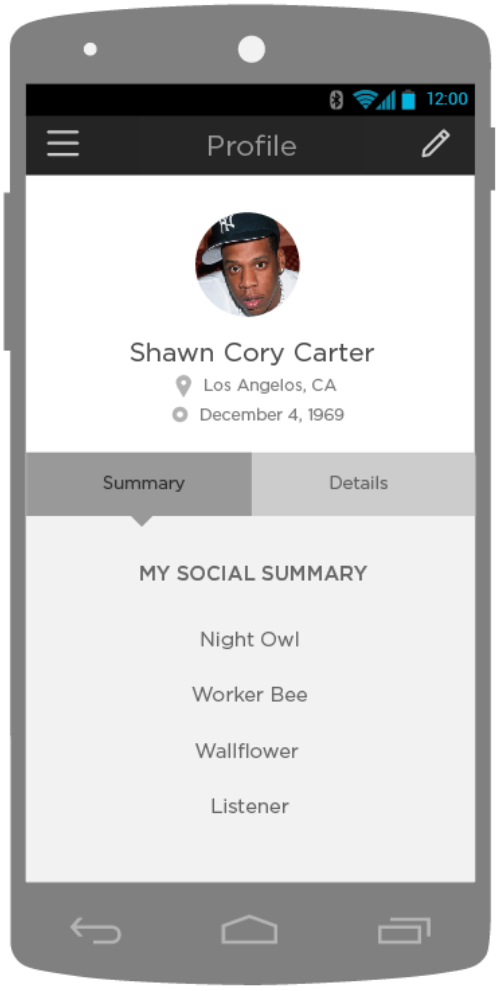

Figure 5 User's profile and Social Summary

The information presented in the social summary is organized using the following spectrums, as determined by data gleaned from the interviews (see Finding 2):

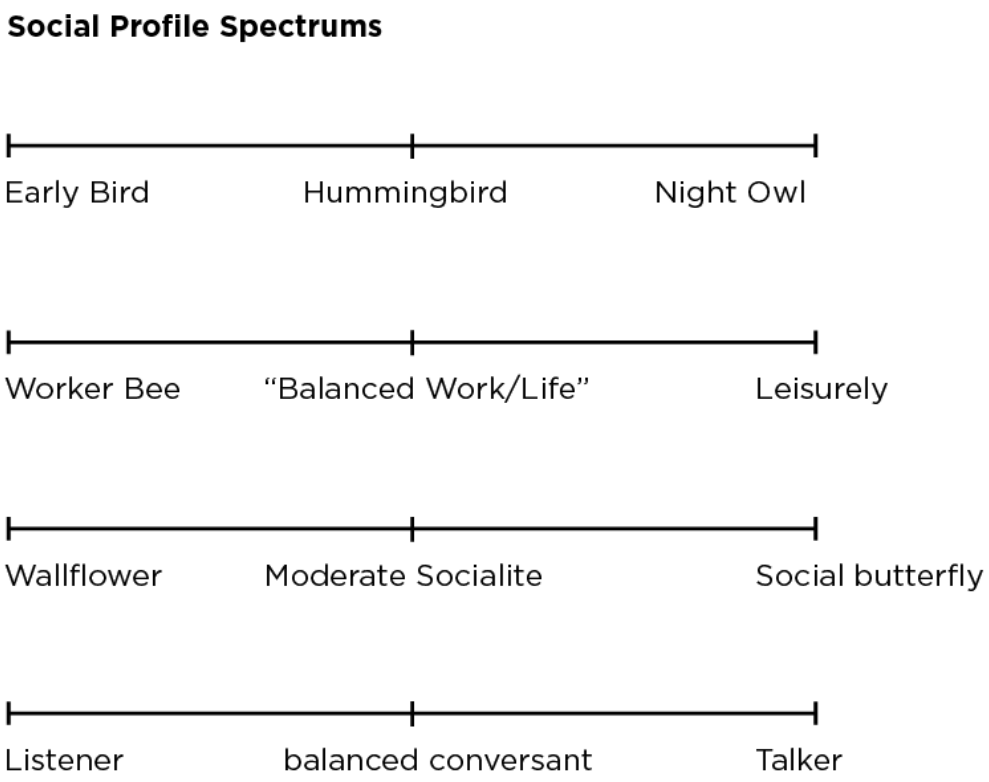

Figure 6 Social Profile Spectrums

Social Comparison

Sociably users are able to compare certain social dimensions against those of others in the Sociably community, thus providing a more meaningful picture of where one stands in the midst of a larger society. A user is able to first determine what segment of the population she'd like to compare herself with, and then decide on what social dimension(s) she'd like to compare. Since it is impossible for a user to compare all social dimensions against others, Sociably has predefined certain comparison dimensions: work/life balance, overall sociability (total hours spent socializing), sociability frequency (total number of interactions), social circadian clock (times of day spent socializing), and talking vs listening ratio.

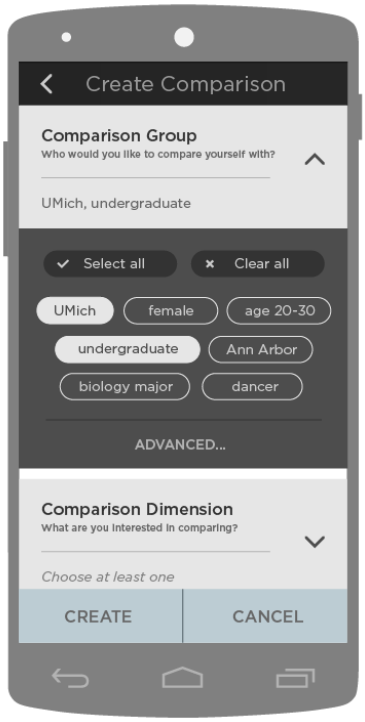

Figure 9 Choosing a comparison group

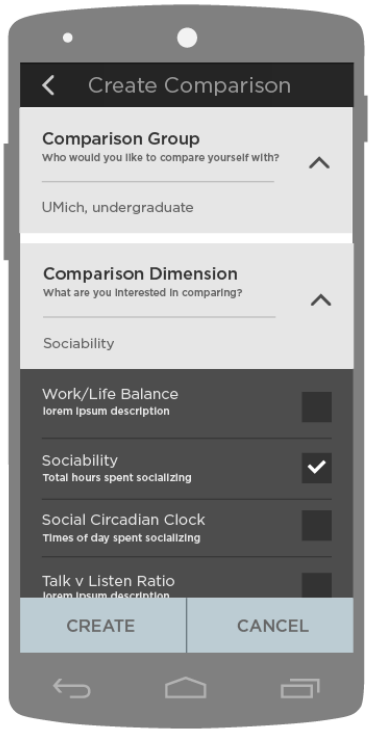

Figure 7 Choosing a comparison dimension

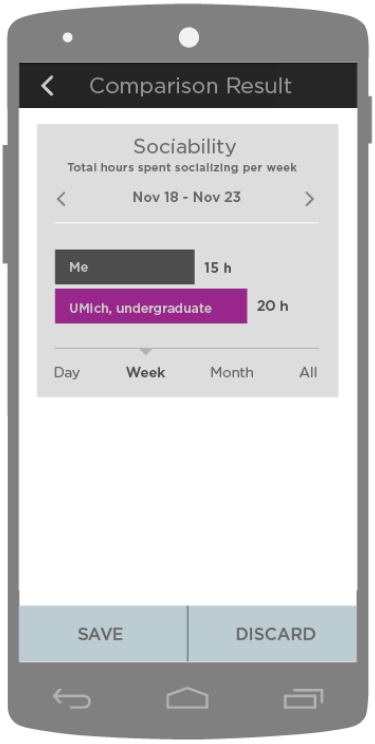

Figure 8 Social comparison result

Goals

Once a user has gained a solid understanding of her social patterns and behaviors, it remains highly possible that she may want to maintain certain behaviors and alter others. According to Peter Drucker, "What gets measured, gets managed." To help users manage their social behaviors, Sociably provides a goal setting feature. Users are able to create customized social goals and Sociably not only provides progress tracking for those goals, but it also reminds users if their social goals are not being met.

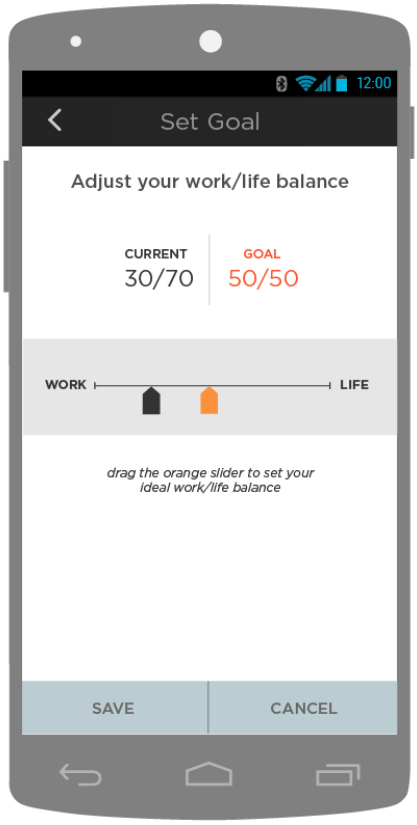

Figure 11 Choosing a type of goal

Figure 10 Setting a goal

People

The heart of Sociably relies on recognizing who the user is interacting with. Even more importantly, Sociably allows users to manage and organize the people they interact with into groups and subgroups, just as one would in real life. This way, Sociably is able to depict more accurate models of a user's true social structure.

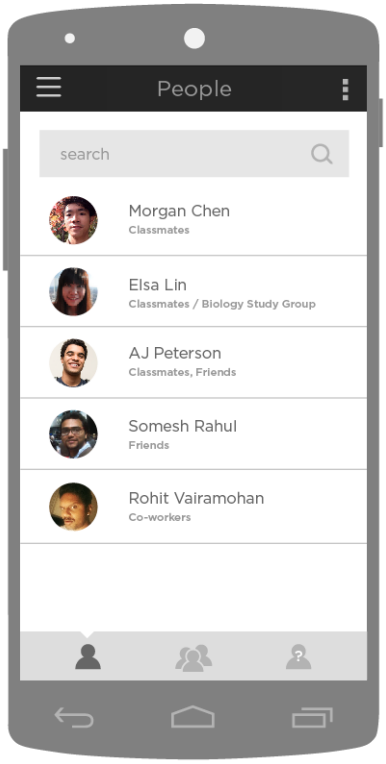

Figure 12 Browsing people

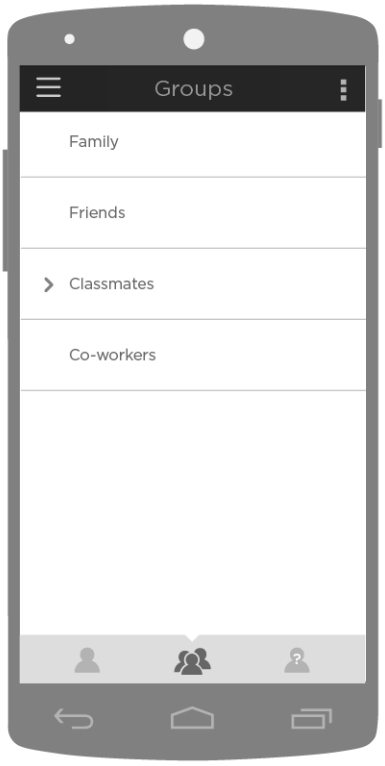

Figure 13 Browsing groups

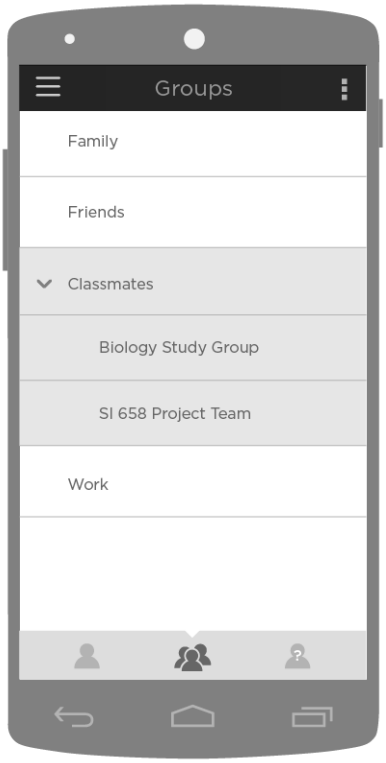

Figure 14 Groups expanded view

Personas and Scenarios

Persona 1:

"Work hard play hard"

Name	Priya Mehrotra
Occupation	Student
Age	21
Phone Usage	Heavy user
Diary Keeping Habit	Intermittent
Gender	Female
Nationality	Indian (international student studying in the US)
Social Nature	Extroverted
Location	Ann Arbor
Marital Status	Single
Background	Pre-med senior student

Interests	Music, dancing, tea, wine, try new restaurants, travel, and hiking
Mobile Expertise	Advanced, Laggard
Mobile "Tools"	Texts, calls, emails, Social Networks, Instagram, Snapchat, FB, Twitter
Education	Pre med student, University of Michigan, Ann Arbor
Goals	Graduate with honors, yet spend time with friends because time is short
Needs	Balance social life with studies

Goals and Personality:

Priya is someone who loves both partying and working hard. She valedictorian of her high school in India, and came to the United States to pursue university studies. She has an innate desire to be at the top of her every class. Priya is also a very social person and tries to maintain a large circle of friends. Currently, she is a pre-med student at the University of Michigan, and her aim is to graduate with honors. However, it is critical that she spend enough time with her friends. She is determined to achieve the sweet spot between work and life.

Scenario 1:

Priya was at a friend's house for a Friday night party. Her friend John also came to the party. They were all having a good time. When John looked at his wristband and walked out to the patio, Priya thought that something might be wrong, so she decided to follow him. She saw John was talking to his sister on the phone. After he ended the call, Priya asked him if everything was alright. John smiled at her; he said that he has not been able to hang out with his sister lately, despite the fact that she just moved into town, so he was calling her to set up a lunch date. Priya looked puzzled and quizzed John further. John answered that

he has downloaded this app, Sociably, which tracks his in person interactions with the people around him. He also told Priya that he set a goal to have at least one hangout every week with his sister. Piecing everything together, John finally told Priya that he had received a notification from the app that he should meet his sister tomorrow as he had not done so this week. Priya's jaw fell in awe. She had never even thought that an app like that could exist. Priya also had some close friends who she always planned to meet up with, but due to some reason or another, she always forgot to do so.

Priya could not stop thinking about the app and the goals she could achieve with its help. She has always wants to prioritize her studies, but she also wants to socialize with the right people in her precious spare time — it was so difficult to keep track of everything. With Sociably, she finally felt like she could have the right ingredients to do so. With that, Priya left the party early to go home and order the Sociably wristband. She was pleased to see that the band was available in jewelry version. It was really pretty, so without further ado, Priya went ahead with the order.

Before the wristband arrived, Priya had already installed the Sociably app and was ready to connect it with her new wristband. As soon as the wristband arrived, Priya placed the band near her phone, and the Sociably app quickly indicated that it had paired with the band and would soon start tracking Priya's social interactions. The dashboard of the app showed Priya visualizations of work/life balance, a breakdown of conversations with respect to her social groups, and asked her to create more cards based on what she wanted to know about herself and her interactions. Each bit of information was represented on a "card" in the app.

Priya was exultant to find that the app offered flexibility and fluidity based on her needs and goals. Since Priya wanted to keep track of the number of times she interacted with any given individual, she decided to add this information as a "card" to her dashboard. Next, she was intrigued with the idea that she could keep track of the content of her conversations by tagging her interactions as they occurred. She decided to add this card as well. After adding these cards, she started to customize her Sociably wristband. She added the tags #quality, #fun, #loveit to the speedy tagging list of the band.

Priya wore the Sociably wristband to school. She was eager and excited to visualize her social interactions. Soon, she spotted John. As soon as Priya started a conversation with John, the wristband

gently vibrated to let her know that it has started characterizing the social interaction based on the cards she had chosen for herself. After the conversation ended, the wristband vibrated twice to let Priya know that it has successfully logged the conversation she had. Excited, Priya tapped the wristband and saw a system suggested a tag: #school. Priya smiled while looking at the tag, and tapped the wristband to confirm the tag. The suggested tag was appropriate, as the conversation indeed was happening at school. Next, she looked at her predefined tags: #quality, #fun, #loveit. Priya tapped the tag "#fun", as the conversation she just had with John had been fun.

Next, Priya met with Professor Raman. She expected to engage him in a deep conversation about the final thesis project that she was working upon. As soon as Professor Raman started the conversation with Priya, the Sociably wristband vibrated to let Priya know that the characterization of this social interaction has begun. Priya was deeply involved in the conversation with Prof. Raman. In the background, Sociably was noting Priya's pitch, voice and other details about the conversation. After some time, Prof. Raman paused to think about a problem that Priya had asked. The Sociably wristband, thinking that the social interaction had ended, vibrated twice. Priya knew that it was just a pause in the interaction, and reached down to her wristband and pressed the only button present. The Sociably app understood what Priya meant, and continued characterizing the social interaction with Prof. Raman. It was all so nuanced that even in the deepest thoughts Prof. Raman was not at all distracted by Priya's actions.

Priya did the similar exercise several times that day. After she returned home, she inquisitively opened the app on her mobile. The dashboard of the app had two visualizations ready for her: work/life balance, breakdown of conversations with respect to her social groups. She found out that she had mostly interacted with friends that day. Based on her inputs, Sociably had pre-defined her social groups and was associating her conversations with each of the defined groups. So Priya came to know, that for that day, she had more social interactions with friends than with people from work. She also spotted notifications from the app saying that she should recognize the persons she had interactions with so that the app could show her even more nuanced information. Priya recognized them one by one by looking at the location of the conversation, duration of the interaction, and listened to a ten second, garbled voice sample to identify

each person. It was an easy task for her to do since the system provided her so much of context about each conversation. Once she had completed this process, she went back to the dashboard and saw that she had six conversations with John that day. Next, she looked at the content of the conversations and found out that she had many fun talks that day. She realized that this was the reason why she was feeling so happy. Finally, she saw that she had a lot of sports related conversations that day. Deep within Priya, she always knew that she was a sports person, but had never gotten confirmation for that. Now, she knew that she definitely was a sports person.

Priya realized that, even though she had only used this app for one day, she already gained so much more knowledge about herself. This feeling was very empowering. Now, she had much more control over her life. She felt so excited and happy that she kissed the screen of her phone in order to convey her love for the app. She wanted to make this app a part of her life.

Persona 2:

"Don't confuse having a career with having a life"

Name	Terence Wang
Occupation	Software developer (recently hired)
Age	27
Phone Usage	Heavy user
Diary Keeping Habit	Does not like to write at all
Gender	Male
Nationality	American Born Chinese
Social Nature	Introverted
Location	NYC
Marital Status	Engaged
Background	Software programmer. CMU graduate. Fiancé: library science Syracuse grad.

Interests	Read, music, time with fiancé, brew own beer, live shows, cooking, and foodie
Mobile Expertise	Expert
Mobile "Tools"	Designing his own OS, jailbreaking, beta testing, Android early adopter, and mobile programming
Education	CMU grad in computer science
Goals	Work/life balance Make new friends Feel like home in NYC with his fiancé
Needs	Establish new relationships and settle into new social atmosphere

Goals and Personality:

Terence is someone who loves spending time either alone or with his fiancé. He recently graduated from Carnegie Mellon University and moved to New York to pursue a new job. His aim in life is to keep his relationship with his fiancé healthy and happy. He strives to spend equal time at work and with his family. He wants spend quality time pursuing his passions. He believes in nipping problems in the bud. He is cautious, and tries to foresee future conflicts. Terence is also a hard worker, but does not want to become a workaholic.

Scenario 2:

Terence was at an extended business meeting with his boss when his fiancé messaged him about the date that he had promised her. Terence knew that the meeting was far from ending; hence, he sent an apology message to his fiancé. His fiancé understood his situation and accepted the apologies. Terence knew that his fiancé was the coolest girl that he had dated so far. Other girls would have been irked about

the canceled date. However, Terence he also knew that this might turn into a bigger problem later. Therefore, he decided to take proper actions in order to prevent the ramifications later.

Soon after the meeting, Terence opened the Sociably app on his mobile. Terence had been using the app for quite some time. He typically uses the app to see how his social interactions play out among his different social groups. But now, he needed to devote more time to his fiancé. He decided to track his social interactions in terms how much time he devotes to his fiancé. He added the card "Breakdown of conversations based on individuals" to his dashboard. He hoped to get some insights on his interactions with his fiancé via this card.

After a long day at work, Terence was about to leave for home when his manager asked him to join a casual business meeting at a local restaurant. Terence reluctantly agreed. After the short meeting, his manager ordered food for every one. While eating, Terence noticed that his colleague Mark was also wearing the Sociably wristband and was tagging his current conversations using the wristband. Just out of curiosity, Terence decided to do a quick social comparison of his social interactions with other employees in his organization. He opened the app Sociably and went to social comparison tab. Next, he chose as the comparison parameters employees of his age, working in the same organization. Within seconds, an overall picture of the summary was painted for him. The results were alarming. Terence was shocked to find that his work-life balance was far worse than the average work-life balance of those in his organization. Instantly, he decided to pin this visualization to his dashboard, so that he can regularly monitor his work-life balance and was motivated to improve it.

Determined to improve, Terence closed the app and decided to leave for home. His boss tried to hold him for drinks, but Terence was determined to spend more time with his fiancé. As soon as Terence reached home, he called his fiancé and asked her to go with him on a late night date. Terence's fiancé was overjoyed. It had been quite sometime since either of them had spent enough time with each other. The date was a success and both of them felt light and happy.

The next day after reaching office, Terence called his fiancé and asked her if she was available to come to his house for a movie. Terence's fiancé was thrilled to see the gradual changes in Terence. Now,

he was becoming more serious about them spending time together. She did not hate the earlier Terence, but this one was better, and she chuckled while having this thought.

Terence, on the other hand, was checking his Sociably app daily to see the status of his interactions with his fiancé. He was glad to see that he was making progress. Now, he was spending more time with her than ever. His work-life balance graphs were improving — he was also moving closer to his office's average. These maintained levels of family interactions were also having a positive effect on his work. He felt happier, overall. Many of his office colleagues had noticed and mentioned his positive change in mood. Internally, Terence knew that Sociably had played a major role in this change.

Now, Terence had only one thing left to do — perfect his work-life balance. He did not only want to meet the office average, he wanted to be better than that. He had always thought that spending equal amounts of time for work and for one's self and family was the way to do it. So, he was determined to strike that 50/50 balance. That very day, as soon as the clock struck five, Terence picked up his bag and left for home. Because Terence usually works late, seeing him leave early caused some curiosity in his colleagues. A couple of them actually and asked if there was any sort of emergency. Terence smiled at them and replied, "Not today," and left.

That night, Terence had an epiphany. He really liked the Sociably app. It matched closely with his personality. He always believed in taking care of any problem before it becomes a significant one. Sociably specializes in doing that. He felt that, finally, there is one worthwhile use of tracking body data. He was impressed with Sociably, so he suggested to his friends and family to start using it as well. This way, they could also become aware of their social selves.

Persona 3:

"Be the change you want to see in the world"

Name	Amanda Bennet
Occupation	Established working professional (working from home)
Age	42
Phone Usage	Moderate
Diary Keeping Habit	Yes, records daily events
Gender	Female
Nationality	American
Social Nature	Ambivert (Traits of both extraversion and introversion)
Location	Los Angeles, CA
Marital Status	Married and has three kids
Background	Makes jewelry and sells on ETSY
Interests	Arts & crafts, art shows, pottery, interior design, Rock 'n Roll, and

	antique guns
Mobile Expertise	Intermediate
Mobile "Tools"	Some smart phone apps, check ETSY, calls, emails, texts
Education	Los Angeles community college
Goals	Not just work all time Spend time with kids and husband Get out mix with people (ETSY teams, school functions)
Needs	To have more face to face interactions

Goals and Personality:

Amanda is a person who loves her work and spending time with her family. She had a moderate education, but is now determined to make a positive change in her life. She is an entrepreneur and loves this feeling. However, she misses spending more time with her husband and kids. Even though she loves working and creating art from home, she also misses being able to meet new people. She is well aware of her responsibilities as a mother and as a wife, but sometimes wonders if she is able to deliver as per the expectations of her husband and kids.

Scenario 3:

Amanda had just finished creating the final round of products for her customers at ETSY. She knew that she had worked hard to get this done. She felt a sense of pride for serving her customers well. Recently, she had read the reviews of her customers at ETSY. They were all so positive and so encouraging to read. If only she could meet them all for real. Or, for that matter, meet anyone from ETSY, and share her feelings about the work she does and the reviews she gets. Since she started working as an

entrepreneur on ETSY, she has had this feeling that she is not having enough real, face-to-face social interactions. However, she also feels that her desire to meet new people disrupt might her relationship with her husband and kids. While thinking about this issue, Amanda was also browsing through the web casually and something caught her attention. She saw an advertisement for an app called “Sociably”: an app to maintain your social interactions and help you become more aware of yourself. She gazed at the ad in excitement. This was something that she wanted. It might act as a panacea to all her problems. She instantly downloaded the app on her mobile and ordered the wristband.

While waiting for her wristband to arrive, Amanda looked at all the tutorials for Sociably and prepared herself to start working with the app. As soon as the wristband came in the mail, she installed the system and updated the tags. Next, she started to set goals. She was intrigued by this functionality, as she always wanted to make sure that she is doing her responsibility towards her husband and kids properly.

The first goal that Amanda set was to set aside two hours of interactions with each of her kids and husband. She thought that two hours worth of interactions with each of her family members would provide enough bonding time for all of them. Next, she always wanted to meet some new people, either from ETSY or from her kids’ schools. So, the next goal that she set was to meet five new people every week. Amanda felt excited after setting up these goals. She knew that she had taken the first positive step towards resolving her apprehensions.

A couple of hours later, her kids returned from their schools. She made it a point to ask them everything about their schools. Her kids became interested; this was the first time that their mother was taking so much interest in their lives at school. Excitedly, they told her each and every detail. Every time Amanda finished an interaction, the wristband gave her an indication that it was characterizing that particular interaction. Amanda had not had this much of fun with her kids in a long time. She was feeling both happy and relieved. It was then that she decided to look at her band and see her progress towards her goals. She was enthralled to find that she had already completed her goal of interacting two hours with kids. She could not wait to complete her similar goal of interacting with her husband.

Amanda served food to her kids and cleaned the dishes. At that same instance, she received a message from ETSY. Excitedly, she opened it and read that there was a local ETSY meetup that was happening near her house in half an hour. She had always prevented herself from going to meetings like this because she thought that it would hinder her duties at home. But today, she knew that she had already spent quality time with her kids. She went to her eldest kid, Jane, and told her that she would be leaving for a bit for work. Jane was humble enough to let her mother go and promised to take care of her brothers. Amanda felt happy and satisfied, and left for the meetup.

Amanda could not stop herself from giggling while she was on her way to meet the local ETSY entrepreneurs. Before, she had never met them without feeling guilty of abandoning her duties at home. Today was different. Today, she was feeling happy and excited. She got out of her car and went into the meeting. She was so happy to introduce herself to fellow ETSY'ers and to get to know them. While returning from the meeting, Amanda decided to check her Sociably dashboard. She could not believe her eyes. She had interacted with more than 15 ETSY'ers at the meet. She had already accomplished her weekly goal. This gave her a lot of satisfaction.

Returning home, she saw her husband waiting for her. Straight away she started conversing with her husband. She asked him about his work and then told him about the eventful day that she was having. She felt that she was having a good meaningful conversation with her husband, hence subtly tapped her band to tag the conversation as #quality. After the conversation, Amanda opened her dashboard and saw that her goal of interaction with her husband was about to get completed. She was happy to see that.

That night, Amanda felt the satisfaction and happiness that she had never experienced before. She had the cure to ending all her apprehensions. She was more aware of herself now, and and in a better position to make positive decisions. She already was determined to make Sociably part of her life.

Checklist

Representation of Self

Sociably is an individual-oriented system. Representation of self manifests throughout the major features of the system, including Dashboard, Social Comparison, and Profile. The visualizations of a user's social interactions inform the user of different dimensions of her social self. With Social Comparison, in order to compare certain social patterns with others, a visualization of the dimension which the user wishes to compare is presented to her. With the Profile, the section is a concise summation of the user, presenting her an overall picture of her social self. In order to render a social summary, the user data is first compared with the norm. Based on where the user falls in the norm, the system renders short representation of her self, such as Social Butterfly, Wallflower, or Worker Bee. The section here works similarly as a reflector (Crumlish and Malone, 2009). Though it is not for the public, it serves the purpose to inform the user how the general public may typify her as a social being. These design implications regarding representation of self were drawn directly from the diary study.

Interviews revealed that participants often asked questions about their own social behaviors. Questions included, "Am I a morning person?" "Am I an evening person?" Participant P7 asked the question, "Am I more active during the conversations or more Passive?" Furthermore, Participant P2 wondered how to compare herself to the general public, and how to characterize her social self with regard to the time of day. Moreover, after the study participant P1 had this insight that he had a lot of conversations around sports. Hence, we will design the system to not only answer the questions that the users of the system might already have, but also make them aware of the things that they do not know about themselves. For example, the four default visualizations on the Sociably dashboard will allow the users to get an overall picture about their social selves. Additionally, participant P5 stated that her interactions are often dictated by the location she is at. Hence, for this type of user the representation of self also bleeds into the location of the interaction. Therefore, we will build the capability in the system, whereby each interaction will have the attribute of location attached to it. Further, the user will have the freedom to tag the interactions with their favorite locations.

Representation of Others

The nature of social interaction involves others. As Sociably is an application that enables users to understand and manage their social interactions in the real world, the functionality inevitably involves managing the other contacts in the system. Furthermore, the overarching insights gained from the diary study once again confirmed that users characterize social interactions based on who they interact with. On every artifact collected from the participants of diary study, the majority of interactions were noted with the person/people they talked to. For instance, P8's artifact took the form of a spreadsheet, with one column dedicated specifically to keeping track of "Who I interact With." P6's artifact included notes such as: "Lunch with Joel: job search and resume." P3's notes were less specific, though nonetheless include data regarding the other party/parties involved in the interaction: "Phone call with co-worker."

Consequently, the "People" section in the mobile application, where users manage their real world contacts, becomes critical as to how the system makes sense to Sociably users. Unlike other typical social platforms where users are interacting with other users within the same interactive system, Sociably aims to represent others in a way that reflects a users real world interpretation of her social spheres. In other words, the more similar the user is able to reconstruct her real-world social circles on Sociably, the more accurate Sociably represents her mental model of her surrounding social world.

To breakdown the process of reconstructing the user's social circles in the system, Sociably makes use of 1) garbled voice pattern, and 2) avatar pictures and names of contacts. Garbled voice patterns serve as a bridges, connecting a new individual sensed by the system, with the identity of a person the user knows in the real world. By using garbled speech pattern, the content of the speech is never revealed, yet the sound bit will maintain the voice characteristics of the speaker (Choudhury and Pentland, 2002). This way, a user may identify the speaker by listening to a short segment of garbled speech and input that identity into Sociably.

For the contacts who are meaningful to the user, this garbled audio serves as a one-time token, as well as a temporary representation of others to the user. However, a number passer-bys may stay at this stage of temporary, unidentified representation if the user chooses not to teach Sociably to identify these unknown voices. Once a voice has been identified, however, an avatar photo and name serve as the

primary representations of others, replacing the garbled audio. These names or photos are more recognizable to a user than the garbled voices. Therefore, by using names and photos, Sociably can better depict an overall picture of a user's social interactions.

Note the difference between the representation of others in Sociably versus those in other typical social platforms. In Sociably, the representation of others is not being created by those other individuals. These "others" are organized based upon the user's mental model of her social interactions — so the "others" in the system are shells of the people from her real world social circles. The representation of others exists on Sociably to support the tracking and visualizations of the social interactions, as well as to assist the user to facilitate face-to-face interactions and to achieve her social goals in the real world.

Representation of Activities

Since Sociably is designed to keep track of and manage social interactions, representation of activities manifests throughout the visualizations on Dashboard, Profile, Social Comparison, Goals, People, as well as the wearable wristband. So to speak, the activities on the system are the social interactions captured from the real world. Theoretically, wherever Sociably identifies a record of social interaction, such data will be represented as signs of life, such as the total duration of social interaction for today on the default visualization on Dashboard, or the frequency of the user talks to a particular social group. On Social Comparison, Sociably users can compare with a group of people she is interested in. No matter the designated group is the world or people who share similar demographic background, relevant aggregated data of the designated group is pulled out to render a comparison for the user, where shows signs of life of other current Sociably users. On Goals, if the user has created a social goal, the indicators like progress bar or the number of hours will also indicate the signs of life. Likewise, Sociably user can see the records of relevant social interactions on People.

Our participants were interested into knowing their performance over an event. Participant P2 stated that she wanted to know her activity list during and after any conference that she attended. Hence, in Sociably we categorize the social interactions that the user is having real time. After each social encounter the user can tag that interaction, add new contacts, create new social groups. After the event,

the user can reflect upon the interactions that they had by looking at the various visualizations, prepared by Sociably, for that time period and get an overall picture of their social activity during the event. Example of social activity might include - How many new individuals I had interactions with?

Another of our participant P1 stated that he would be interested in seeing his social activities over the weekend. In Sociably, we designed the section History, where the user will be able to see all his social interactions at one place. He can filter the interactions with dates and see a direct list of interactions for those dates. This comprehensive interaction list will satiate the needs of the users like P1.

Roles

Roles within the Sociably system are represented within the "People" section. As individuals are identified, a user may group these individuals together into social circles. As mentioned in the discussion on the representation of others, the contacts who the user has identified on the system are her perceived contacts based on her mental models. From the diary study, when participants omitted the real names of who they interacted with (due to privacy concerns), they naturally defaulted instead to writing down the roles of these people. For example, P3 noted "discussion with co-worker" and "speak to son, babysitter".

The roles identified in Sociably will be highly dependent on each individual user, as each user has different subjective interpretations of her relationships with others. Specifying these different roles and groups will alter the expected interactions associated with those groups. For instance, when a user characterizes one contact as a "co-worker," she expects interactions with this co-worker are primarily in a professional manner. Similarly, when creating social groups on Sociably, a user may group a number of contacts based on the context.

Norms

Sociably helps users to bridge the gap between their perceived social interactions and actual social interactions. The evidence from the diary study shows that participants often times compare themselves against certain expected norms. For example, P6 wrote down a breakfast with his girlfriend. Even though

they did not actually speak, or have any form of audible interactions, he believed that, based on the norm, breakfast with his girlfriend is supposed to involve social interactions. One participant wondered "Am I keeping up with people I want to be keeping up with?" P3 raise the question, "Am I saving enough time for my husband?" P2 wondered about the amount of superficial conversations she was having, and whether or not that proportion was too high, which could indicate that she might need to change her social behavior. It might not be always apparent, yet social comparison happens consciously when participants think of their interactions.

By utilizing Social Comparison, users gain awareness of what "normal" social behaviors are with regards to certain groups of people they wish to compare with. To address privacy concerns, one user does not have access to see another user's social interactions. In addition, from the diary study, all the participants noted down diverse attributes associated with the interactions, such as mood from P8 or location from P5. Chances are, the patterns would be too individualized to be effectively compare with other users. What the user can compare with is the mean of the designated group. From the visualizations, the user is able to gauge whether her current social interactions are normal, or whether her ideal state of social self is reasonable. In sum, the feature of Social Comparison offers Sociably users a reference to evaluate their social selves, and an non-intrusive way of gauging whether or not certain social behaviors are "normal".

Another design implication with respect to social norms is the use of the wearable wristband. From the diary study, P1 stated it would be strange to note down interaction in the middle of an activity. Sociably allows users to use voice input to annotate conversations using self-defined tags with the wristband — therefore, all operations should be non-intrusive to the real-time interactions. With vocal tags and annotations comes the issue of being overheard by another party. Tags and annotations can be very private — therefore, Sociably also supports manual tag entry. Wherever possible, the Sociably system seeks to blend in with social norms rather than hinder and oppose them.

Goals

Since the system is heavy on one individual user, the goal of the user is to maintain her social health. From the diary study, P1 mentioned what he thought Sociably could be useful to someone if he wishes to talk to some friends more or talk to them less, and perhaps on weekends he could hang out with certain friends he has not seen for a while. Further, P7 mentioned that he wanted to be more active during the interactions. Participant P8, mentioned that she wants to have more happy conversations. Gaining these insights from the diary study, Sociably encourages users to manage their social interactions by allowing the goal setting feature. By creating goals based on different time intervals, the seemingly abstract and distant goal, maintaining social health, becomes concrete and approachable. Users can thus fulfill their social goals step by step without being overwhelmed.

Non-social requirements

The following section details certain requirements of the system, Sociably, which are non-social, yet nonetheless important for the successful function and execution of the application.

Wearable sensing wristband

The wearable wristband portion of Sociably serves as the primary information detection and input device. Equipped with a microphone, a touch screen surface, and two buttons, the wristband is responsible for detecting voice biometrics, logging user-inputted tags, keeping track of conversations patterns, and determining geophysical location.

A wearable wristband hold certain advantages over a mobile phone as a means of data gathering. First, a wristband is easier to access. One does not have to go through the length process of searching for one's phone, turning the device on, opening the application, then finally, tagging a conversation. Second, a wristband is more likely to record accurate voice biometrics. A phone may be hidden away in a pocket, a bag, or somewhere out of reach where the microphone may be muffled. Third, an application like Sociably needs to be running constantly in the background — this sort of background activity could drain

a mobile phone's battery significantly. Finally, a wearable wristband is able to offer the user real time, immediately accessible feedback. For example, the wristband will give a subtle indication (either by light or vibration) that it has detected the start and end to a conversation. If the wristband is incorrect in its detection, then a user may correct it immediately. This correction not only allows for more accurate tracking of information, it also allows the system to calibrate and will learn for the future.

A major component of the wearable wristband is the tagging feature. According to the diary study research, almost all participants indicated a desire to note down the content of the conversations they conducted each day. However, Sociably is not able to record the content of conversations, as this would be a major privacy breach. Instead, Sociably allows for users to define tags so they may annotate conversations in real time. After Sociably has detected that a conversation has ended, the wristband will display both suggested tags, as well as user defined tags, for the user to toggle through and indicate the appropriate ones. The wristband also allows for tagging via vocal input. While voice inputted tags are faster and more flexible than toggling through options displayed on the wristband's interface, voice input is also much more public, as it could be overheard by surrounding others.

Voice biometrics

Sociably leverages the "voice biometrics" as the primary method of data gathering to inform the application. Besides being aligned with CHI competition requirements (using body data), voice biometrics serves two purposes: speaker recognition and social interaction feature extraction.

Voice biometrics refers to vocal characteristics. These characteristics are based on certain acoustic features of speech (dependent upon the anatomy of the mouth, size and shape of the throat, etc) along with behavioral speech patterns (voice pitch, speaking style) (S. O'Modhrain, personal communication, November 26, 2013). By measuring voice biometrics, Sociably will be able to create a voice prints, which would then be used to recognize and verify the identity of who the user is speaking with. This method of recognition is commonly used for security purposes, and is also present in Apple's Siri technology (Bostic, 2013). The use and measurement of voice biometrics is seen as "non-invasive" (Speaker Recognition 2013).

Note that "speaker verification" is different from "speaker identification." Sociably is not performing any sort of personal identification — that task is dependent upon the user. Once a speaker has been identified by the user via a one-time voice recording (garbled, to address privacy concerns), Sociably uses speaker diarization to recognize if that same speaker were speaking again.

Discussion

While the literature review, diary study and interviews have provided solid support to inform the design of the mobile application, Sociably, there still remains certain limitations to the research. We conducted secondary research focusing on social wellness issues, ways of combining human and social interaction tracking with computers, the feasibility of the audio tracking, and privacy issues in laws. From this research, there was not much that related to how to visualize these social tracking information to everyday people. Further usability testing is needed to verifying the effectiveness of the proposed information visualizations.

The diary study asked participants to track their social interactions over the course of only one day. Even though a lot of valuable findings from this research were obtained, behaviors and benefits that are related in a longer period of time tracking were absent in this research. There are some assumptions made based on asking participants to foresee the values they would gain if there is a system facilitating them tracking their social interactions. These assumptions will need to be tested and verified after the system is implemented.

Another issue encountered during the diary research was that some of the participants were doing their tasks with a thought of providing us (the research team) with information that they thought was beneficial to us, rather to themselves. They created artifacts for the purpose of the study, but not for themselves. We found this problem in an early stage of the research; therefore, we fixed the problem by clarifying the purpose of the artifact and asking them to answer questions from the standpoint of their own good in the debrief sessions.

One of the key findings from the diary research was that Sociably needs to embrace flexibility because each of the ten respondents gave us fairly different ways describing social interactions with different points of view maintaining their social health. Although the perspectives they paid attention in common were the four default visualization: work/life balance, group breakdown, individual breakdown, and the content of conversations, other perspectives should also be provided for different people. These four default visualizations were generated based on these ten respondents. However, we need a larger number of respondents to support these. A survey is not a choice here because the idea of tracking social interactions is still abstract to people (people do not track their social interactions consciously); instead, we need to recruit a lot more respondents on this diary research.

Another main issue, perhaps the most controversial one, is that Sociably needs to track a user's voice all time, which serves as the main data input. Note that the system only tracks this data, it does not record raw vocal information. Besides the technical problem of how to get a quality audio information for the pattern recognition without draining the battery life of a device, people do not feel confident to give the permission to allow Sociably to track their voice unless there is a clear and assuring privacy policy provided. The common concern here is that the content of their conversations may be revealed. From a legal standpoint, in some states, to legally record a conversation requires at least the consent from one of the parties who participate in the conversation. However, some other states are more conservative and require the consents from all parties who participate in the conversation (Digital Media Law Project, 2012).

Sociably is actually in a grey area where the state laws may not be applicable. Most of the time, Socially actually does not record the conversations, but only parses the voice information in real-time and retrieve voice biometrics without any content. The garbled voice information is valuable enough for Sociably to retrieve speech features such as pitch, duration, trembles, and is able to be used to identify a person (Choudhury and Pentland 2002). In addition, Klansja et. al. (2009) concluded that people are highly sensitive to audio voice information being recorded, but would be more willing to accept this fact as long as the audio does not reveal the content of the conversation. Also, clearly informing users what

exactly is being tracked to allows users to evaluate the trade-off between their privacy and the value they can get from the system is important (Klasjna et. al, 2009).

The only time Sociably that will store raw audio is when a new voice pattern is recognized and requires the user to identify the voice and put a name to it. Here, the system only records a raw audio for 10 seconds, which will be stored locally on a user's device, and will delete it as soon as the voice being identified. After this instance, Sociably will only need to match a voice pattern in a conversation with the database and verify the identity, and recording is no longer necessary (Speaker Recognition, 2013).

The current design of Sociably includes top five main functions and pages: Dashboard, Profile, Social Comparison, Goal Setting, and People Management. These top five functions are presented based on the diary research results, but the research results reflect a conceptual level. Details of how to best present this information to the users has not yet being verified, and further usability testing is needed. The issues which need to be verified in the further usability testing includes:

1. Do people understand the top 4 default visualizations? How will they interpret these visualization graphics? Are these visualizations beneficial to them?
2. How will people react to the Social Summary? Do they understand the way it presented? Does it make sense in the Profile page?
3. How will people react to the Goal Setting page? Do people understand what social goals are? Does the process of setting a new goal make sense to them? How will people change their behaviors to complete their goals?
4. How will people react to the Social Comparison page? Will they be curious about "how normal am I in the world"? What other values can they get from this function? Does the operation flow make sense to them?
5. How do people feel to wear a wristband? How will people make use of the wristband to tag their conversations?

Currently, in these five main functions and pages, the design was focusing on presenting the body information to the users in a meaningful way and operating each function smoothly and naturally. After

these functions and operation flow were being tested, the design focus will move into more details but less important such as Profile editing, browsing other visualization graphics, and search functions, color themes.

The design currently is focusing on the four default visualization graphics that will be put on the dashboard in the beginning. However, to provide the flexibility not only in the customizing users' own dashboards, but also in a variety of visualization graphics in different perspectives, more works and research are needed to be done to present more examples of visualizations other than the default four. Another, but not exclusive, way to approach this is taking the advantage of crowd computing. People after using Sociably for a while may gain their own insights and thoughts and will like to create their own visualization graphics. It will become a big repository if they would like to share their customized visualization. However, the current design is not supporting users to create their own visualization nor providing a platform for users to share.

Conclusion

An individual's social health and sociability are important to one's overall well-being, yet there are few commercial applications which allow people to monitor and manage their social health. Our system, Sociably, aims to track individuals' social interactions and present meaningful visualizations to help people to better understand their social selves. To gain a deeper understanding of how people tend to characterize and typify their social interactions, the design team carried out a variety of research methods, including a literature review, diary study, and interviews. The results showed that people identified face-to-face interactions as the most prominent type of social interactions, that everyone characterized their social interactions in vastly varied ways, and that people are largely unaware of their day-to-day social behaviors. Furthermore, there is evidence that people are more interested in seeing a big picture overview of their social selves. Finally, in general, there was positive reactions towards a system that might help individuals tracking and attain better social health.

Based on these research findings, Sociably was designed to use voice biometrics as a method of data input. Sociably will present the data in four default visualization, which includes work/life balance, details about social groups that a user interacts with, top user-inputted tags, and top people that a user interacts with. Furthermore, Sociably facilitates people to gain even more insights about themselves by comparing themselves to similar others. Sociably also supports users to set goals to facilitate changes in social behavior in order to pursue better social health. At present, the design is undergoing usability testing — further revisions and iterations are still to come. Eventually, we hope Sociably will bring the benefit to the society and everyone will have better relationships with the people they care about.

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Appendix

Appendix A: Diary Study Call to Action
Fellow Wolverines,

We are five students from the School of Information, Hsiao-Chih Lin, Chin-Jui Chen, Somesh Rahul, Ying Ying Liu and Rohit Vairamohan, participating in the CHI Student Design Competition 2014. This year's theme for the competition is '*Quantified Self*'. We wish to conduct a *Diary Study* as a part of our human-centered design research project.

We are looking for participants for this diary study. The study will require minimal effort over the course of 1 day that you complete independently in your own time, as well as a brief follow-up interview. ***You will be compensated $25*** for your efforts. The data you provide will contribute to larger academic knowledge with the potential of contributing to the greater good.

Please reply off-list if you are interested.

Appendix B: Diary Study Prompt
WHY: We are interested in understanding individual social interaction patterns. By social interactions, we mean anything that involves interactions with one or more other persons.

WHAT: We are asking you to keep track of your daily interactions for 1 day. We want to know how you might categorize, classify, tag, and think about your interactions. Things to think about are included but not limited to: context, space, location, time, nature of your conversations, person(s) that you're talking to, and anything else you that find important. There is no right or wrong way to do this exercise.

HOW: You may track your social interactions using any method(s) you wish: as long as it is in a way that is meaningful and understandable to you. You can represent this data in any form you wish (notes, visualization, anything). Whatever makes the most sense to you. Again, there is no right or wrong way to do this. We will eventually be collecting this artifact(s) from you.

Please try to be as detailed as possible. Please try to note things down as soon as possible after the interactions occur so that the details you record are as accurate as possible.

You will be contacted for a short follow-up questionnaire post study.

You may contact schi-blue@googlegroups.com if you have any questions or concerns.

Confidentiality statement:

Any information that you share with us is strictly confidential and will only be viewed by our project team. Your identity and any personal information that you share with us will be anonymized.

Your participation is voluntary and you may stop the study at any time.

Appendix C: Diary Study follow up Questionnaire

- What did you think about completing this study over 1 day?
    - Would you be interested in continuing this study?
- Why did you note certain things?
- Why didn't you note down certain things?
- What were you thinking when you were nothing these things?
- Why was this important to you?
- Why was this not important to you?
- Rate in order of preference what were the most important things in noting
- What were the challenges involved in collecting the data
- Did this lead to any changes in the way you think about the "social you"?
    - If so, how?
- When did you start getting tired of doing this?
- Do you have any follow-up thoughts or comments about this study?

Appendix D: Diary Study Participants' Artifacts

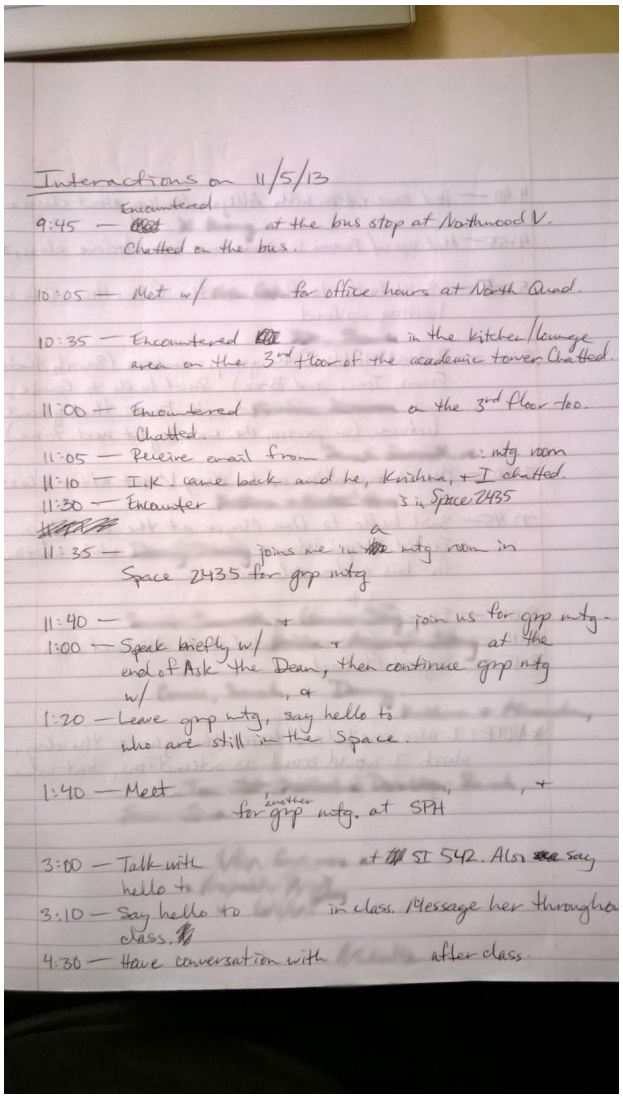
PARTICIPANT 01 ARTIFACT

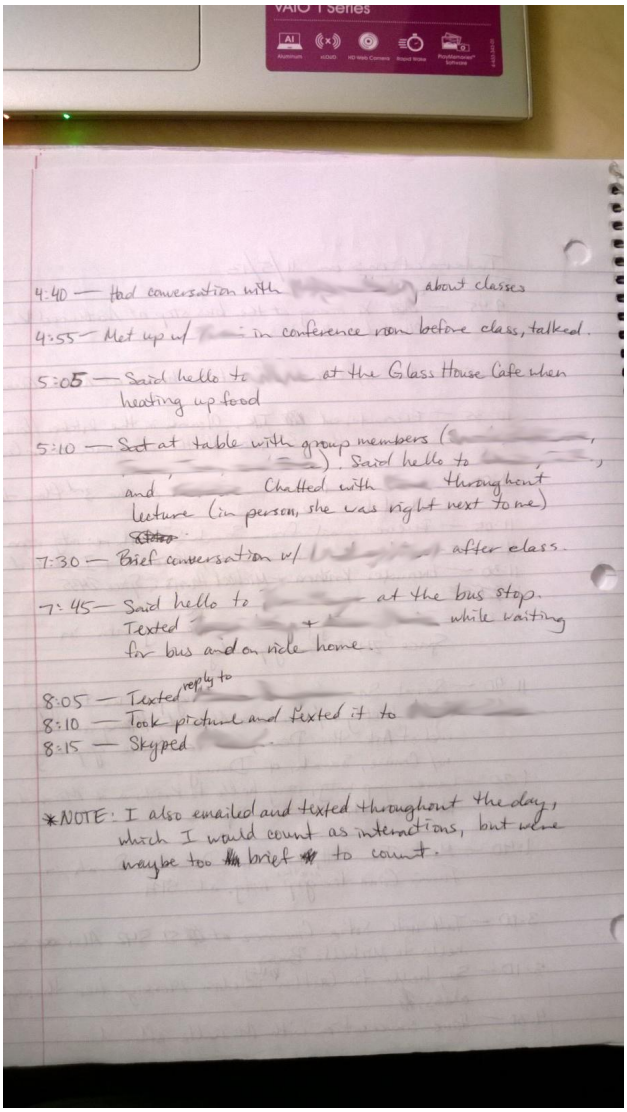
Time	Person	Interaction
9:30	Girlfriend	talking about schedule of classes and meetings for today. Whether or not we are going to meet for lunch and where to meet after class
9:42	Professor P	I sent a professor an email a couple of days ago and saw his response today. I was asking him about joining a graduate class next semester. He allowed me to join but also cautioned me because of the amount of readings in the class.
10:03	brother	My brother posted an article on my facebook. I havent read it yet.
10:10	friend in class	We mostly talked about how the weekend was (parties, homeworks etc). Afterwards, we started talking about a homework assignment we have due on Wednesday and agreed to meet up at 8pm today at the ugli. After class we walked together to the gym and I asked her about her plans after graudation and how her applications are going
10:45	family	My mom, brother, and cousin are on a group chat. They sent a couple of messages talkin about their morning plans.
11:16	Professor G	I am a TA for one of the classes here and the professor sent me an email about some of the quizzes I am making for the class. He wanted to know if I was almost done with the quizzes for Thursday
11:32	worker at the CCRB	I had to talk to an employee about getting an mcard because mine was pealing.

13:00:00 AM	friend that I live with	I saw him at the house and we first talked about the plumbing issues we have been having with our bathroom. He then told me that he went to meijer and told me what he bought. Afterwards, we talked about when we should go to buy our graduation cap and gowns. We ended with me saying I had to go to class
13:19	girlfriend	she sent me a facebook message about where to meet up after class so that we could pick up our graduation cap and gown from the store
13:35	subway	got my sandwich order in
14:06	classmate	I walked into class and said hi to one of my classmates. We talked about the upcoming homework assignment due in two weeks.
14:42	Same friend from 10:00 class	she emailed me the notes. She said " I owe her one"
14:56	Professor G	The proffessor emailed me about the quizzes again. He said that he changed some of the questions and then he asked me to place all of the questions on a word document for the other GSIs. He then told me about the quizzes for next week and the week after.
15:00	professor M	I was participating in class. One things I asked was for a restatement of a concept that was explained. Another thing I did was answer a question that another student asked.
15:38	Verizon	I got a text from verizon wireless about my phone bill
15:52	Professor M	I asked the teacher a questions about what he just said. I didn't understand what he said initially, but after he explained it a second time, I understood it.
15:56	girlfriend	she messaged me on facebook saying that she is doing laundry and to text her when I am done.
16:07	Friend from original class	She messaged me on gmail. It was just a casual converation because she was bored in class. She was talking about some personal issue she was having with someone else in her dorm.
16:48	Professor M	Asked him a question at the end of class about our final projects
17:07	girlfriend	I went to her place, we talked a bit about our day and then we headed out to the store to buy our cap and gown
17:23	girlfriend's roommate	She told us to eat at Pizza House because a percent of the proceeds were going to her fraternity
17:25	seller	I talked to the person selling the cap and gown. She asked me about my major and my height. Afterwards, she asked me about how I wanted to pay for the items.
17:41	Girlfriend	we talked about an idea for an independent research project we are working on.
18:32	Girlfriend	We started watching episodes of Scrubs during dinner. Afterwards we

		talked and laughed about the episode.
20:59	Girlfriend	I told her about a new song that one of my housemates told me about.
22:31	7-11 cashier	Talked to the cashier. Just normal pleasentries. I asked him if it had been a busy night
23:46	Friend H	My friend commented on my facebook about the football game. We talked about the status of the quarterbook and what we think about his improvement.
0:14	Housemate A	We talked about how the day event.
0:20	Housemate AC	He joined in the conversation. We then started talking about the football game.
0:26	Housemate B and ZE	They also joined in the conservation. We first started talking about the football game, we then switched to the Chicago Bulls and then to the Boston Bruins. We also talked about the bullying issue with the Miami Dolphins.
1:11	Girlfriend	Nagging me to take my medicine

PARTICIPANT 02 ARTIFACT





PARTICIPANT 03 ARTIFACT

3:30am-3:45am Son wakes me up- I speak to my husband asking him to go get a sippy cup of milk, speak to son calming him

5:00am-5:15am Son wakes up- I speak to him while I change him, calm him

6:00am- I get up for work, exchanging information via face to face interaction with my spouse and son

7:00am- Receive Text from coworker, respond to text from coworker

7:30 am-8:00am- Speak to son while on car ride to babysitter

8:00am- Drop son off at daycare speak with son and babysitter

8:30am- Text husband, receive text back from husband

8:30-4:30- Checking work emails via work email on computer and personal emails on phone

8:30-4:30-Discussions with coworkers through small conversations, larger conversations noted as longer blocks of time

8:30am-9:30am- Face to face meeting with coworkers

9:30am-Multiple emails to coworkers

10:00am-10:15am phone calls to find trash service

10:30am-10:45am-phone call with coworker

11:00-11:10- check facebook on phone
11:30-11:35-discussion with coworker
1:00pm-2:00pm- Face to face meeting with coworkers
2:10-2:15 ran errand conversed with people
3:00- Called hotel to confirm reservation
3:30-3:45- conversation with co-workers
4:00-4:30-Webex meeting with outside company
4:30-text to husband
4:30-Speak to son, babysitter
5:00-Text to husband
5:30 -Text to husband
6:00- call to husband
6:05 call back from husband
6:30-8:00 conversation with husband
8:00 text from coworker
8:30-9:00 check facebook
9:00-10:00 conversation with husband

PARTICIPANT 04 ARTIFACT
9:10 AM. I see roommate after a few days. We talked about his exam that's today as well. He seems half asleep. Talked for about 3 minutes then I left for work
9:35 AM. Walk into office/work, talk to supervisor as she sits next to me. She states "Happy Monday!"
11:30 said goodbye to supervisor and other coworker
11:40 ran into classmate and talked about health informatics program
12:00 talked to some classmates in a class, lasted a few minutes
2:00-4:15pm, talked with 3 classmates in a group meeting - was very calm yet very tense. worked on stressful project
4:15pm called two friends and mom on phone, talked for about 10 minutes each
5:00 friend came over apartment, talked for a couple hours
7:00pm talked to two friends who i havent talked to in a while for 20 minutes and 15 minutes.
9pm, studying at starbucks and friend shows up
10-1am talked to 3 friends (including friend from above from starbucks)

PARTICIPANT 05 ARTIFACT
Method of communication

Group chat (using iMessage and Kakaotalk)
Group email
Facebook Message
SMS/MMS
SNS (Facebook)
Email

I use Email and Group email for the professional/educational purpose/communication.

Types of people
· Friends
· SI People
· Team members

· Korean SI community
· Professors
· Mentors

Some of the people became my friends.

Types of conversation

· Everyday life
· Interests
· My feeling
· Class project
· Independent study

Once we become friends, we share everyday life, interests, my feeling.

Location

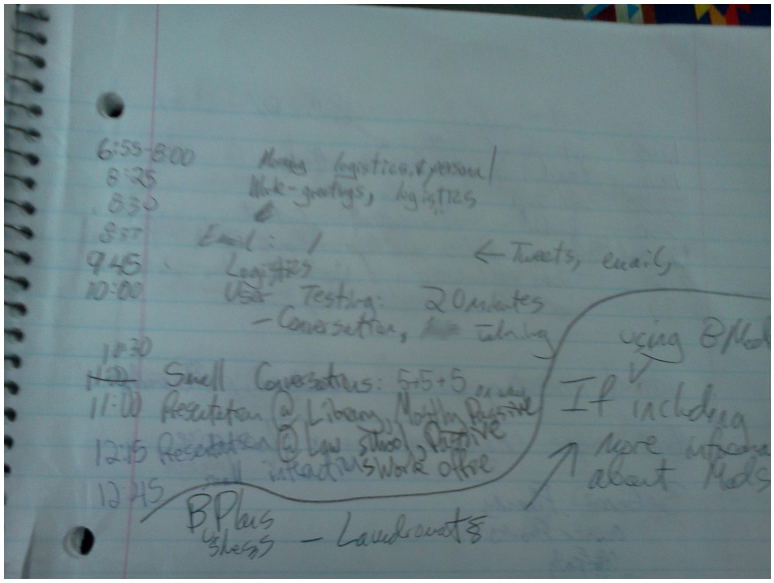
· Restaurant
· Coffee shop
· Bar
· Home
· School
· Meeting rooms
· Library

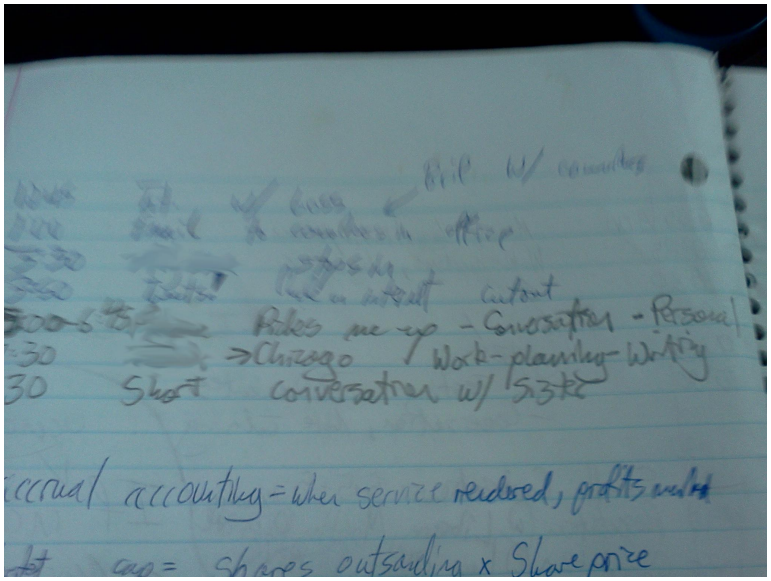
The method of communication and types of conversations vary according to the types of people. If I get to be friends with my team member I will use different methods of communications and talk about different things. When I communicate with my friends the types of conversation, location, communication is not limited to anything.

PARTICIPANT 06 ARTIFACT

8:30 am Breakfast-Food, alone
8:30 email: social, job search, family
11:45 Fantasy football with Iram: FF, anguish, pride (quick five minute converssation)
12:00 lunch with Joel:Job search and resume advice, family friend enjoying a restaurant I would normally not eat at
1:00 Returning clothes:shopping, girlfriend, annoying tourists
3:30 voting: civic duty interacting with crazy people and old people
7:00 T.V-relaxing and hanging out with girlfriend:
8:30 Pizza for Dinner and biggest loser: Dad, girlfriend, take out relaxing.

PARTICIPANT 07 ARTIFACT





PARTICIPANT 08 ARTIFACT

Time	Location	Who I interact with	How	Details	My feeling	Personal/Causal conversation?	Planned conversation?
8:20am	Dinning room at my apartment	a friend who lives with me together	Talk face to face	we ran into each other and sit down to eat together. We talked about the earliest class we have.	Not yet fully woke up, still happy to talk to people	Yes	No

9am-10:30am	Work office	My supervisor and co-worker	Talk face to face	A meeting about projects I'm working at right now	Just work, talk and talk	No	Yes
10:30am-10:40am	Work office	My co-worker	Talk face to face	After the meeting ends, we had a casual chat about weather and classes (we are both SI students)	OK, so so	Yes	No
10:40am	On the way	My boyfriend	Text message	I was texting my boyfriends on and off the rest of the day. We talked about work, job, meaningness things, etc.	happy	Yes	No
11:00am	NQ 3rd floor student lounge	a recruiter	Phone call (never happened)	I was scheduled a phone call with a recruiter so I was waiting for her at student lounge. But she never called me.	frustrated	No	Yes
11:15am	NQ 3rd floor student lounge	XXX	Talk face to face	She came to lounge to make a cup of tea. I greeted her.	OK, so so	Yes	No
11:15am	NQ 3rd floor	a stranger	Talk face to face	I asked him whether I	OK, so so	Yes	No

	student lounge			was getting into his way.			
11:15am	NQ 3rd floor student lounge	CHI team member	Text message	I received a text message from my team members asking whether we have sent out our survey.	OK, so so	No	No
11:20am	NQ 3rd floor student lounge	XXX	Talk face to face	She came to lounge and we had a brief conversation	surprised, happy	Yes	No
11:20am	NQ 3rd floor SI office	XXX	Talk face to face	I was here to pick up an OPT letter	OK, so so	No	Yes
11:20am-11:30am	NQ 3rd floor student lounge	XXX	Talk face to face	We met again and had a 10-min conversation about food, coffee machine and culture differences. The conversation ended because she needed to go somewhere else.	surprised, happy, hope could talk more	Yes	No
12pm-1pm	NQ 1st floor student lounge	MKT 618 team members	Talk face to face/Google chat	Project meetings. We did not have much conversation but focused on making	OK, so so	No	Yes

				changes at google doc.			
1:15pm to 1:45pm	Work office	My supervisor	Talk face to face	A meeting about my schedule and availability in the following two months	Not very happy, feel stressful	No	Yes
2pm-3pm	Outside Ross	another recruiter	Phone call	Supposed to be a job interview but because they did not sponsor h1b, turned into a causal conversation about my career goals	happy to talk to people about what I would like to do. Not so happy because this will never be a job offer	No	Yes
3:40pm	UM internationa l center	front desk staff	Talk face to face	Submit my OPT application. I also asked him a question about OPT.	OK, so so	No	Yes
4pm	NQ 1st floor student lounge	MKT 618 team members	Talk face to face (never happened)	I thought there was a meeting, but I remembered a wrong time. after waiting for about 5 mins, I texted one of the team members to	OK, so so	No	Yes

				ask whether there was still a meeting			
5pm	NQ LRC	MKT 618 team members	Text message	My team member texted me back said that there was no meeting	OK, a little frustrated	Yes	No
5:40pm-6-20pm	On the way back home (bus and road)	My boyfriend	Phone call	Causal chat	Good	Yes	No
6:30pm-7pm	Dinning room at my apartment	a person who sit next to me at dinner time	Talk face to face	We talked about classes, her major, teaching certificate in Michigan and US, etc.	Good, better than expected	Yes	No
7pm-8pm	Dinning room at my apartment	a friend who lives with me together	Talk face to face	I provided suggestions for her toefl test and school application	Good to help people	Yes	No
8pm-9pm	At north campus	a close friend who lives with me together	Talk face to face	We went out for a walk.	Great, cold	Yes	No
11:30pm-2pm	At living room at my apartment	a friend who lives with me together	Talk face to face	We played video game together	Great, scared (because it is resident evil)	Yes	No

PARTICIPANT 09 ARTIFACT
Time: Early morning
Place: Home
State: Hurried, getting ready for work

Customary Good Morning wish to XXX (temporary roommate).

Time: Morning
Place: On the way from home to work
State: Fast paced walking

Small talk with XXX… about work, his apartment hunt, randomness…

Time: Morning
Place: Office, Meeting room
State: In meeting, At ease

XXX and XXX make for pleasant people to meet early in the morning. We discuss UX, stuff we are working on, and present ideas. All in a quick 15 min meeting.
Very productive.

Time: Morning
Place: Office, Kitchen
State: Hungry! And happy - free breakfast at work!

Everyone's excited to be eating yummy breakfast, and getting free swag from the company. Talking about food, breakfast, randomness….

Time: Noon-ish
Place: Office, Meeting room
State: In meeting, Excited

Talking to a user. Always exciting! New insights await.

Time: Noon
Place: Office, Meeting room
State: Thinking… (After meeting discussions)

Trying to make sense of the interview with XXX and XXX. Some points validated, some new points surface. Putting thoughts to words and in a spreadsheet.

Time: Early Afternoon
Place: Office, My desk
State: Relaxed. No meeting lined up.

Fellow teammates talking about how no one is hungry for lunch after the heavy breakfast. I agree.

Time: Early Afternoon
Place: Office, My team space
State: Thinking...

Talking to XXX about making sense of the interviews. Interrupted by XXX.

Time: Early Afternoon
Place: Office, My team space
State: Excited!

XXX shows new designs for our interactive name tags! Very cool!

Time: Early Afternoon
Place: Office, My team space
State: Thinking… Analyzing…

Resumed talking to XXX about what to draw from the interviews. Interrupted by XXX.

Time: Early Afternoon
Place: Office, My team space
State: Excited, Playful, Distracted

XXX shows us a Juggling Kit she got. I play with it for the next 10 mins.
Decide I need to get back to work.

Time: Afternoon
Place: Office, Meeting Room
State: Thinking, Analyzing, Brainstorming…

Tried to figure out the next steps in the research process

Time: Afternoon
Place: Office, Kitchen
State: Hungry

Discussions about the 9 different types of frozen burritos in the freezer.

Time: Afternoon
Place: Office, Meeting Room
State: In meeting, Excited

Talking to a user! Always exciting! Also, we have talked to this guy previously and he can be very critical sometimes! It should be interesting.

Time: Late Afternoon
Place: Office, Meeting Room
State: Weird state between excitement and exhaustion and confusion and clarity. Also, really need to pee.

The user session lasted wayyy longer than planned. We got a ton of insights. Me and Ambar are thoroughly confused about next steps. Ambar seems lost and done with the day.

Time: Early Evening
Place: Office, My Desk
State: Determined to wrap up work, Productive

XXX drops by to tell me that he needs to go somewhere and that I should continue home without him. I nod. Get back to work.

PARTICIPANT 10 ARTIFACT
10am – got into work (late), two colleagues said hi as I walked in. I said hi back but they didn't hear so asked if I was alright. I said yes, blowing my nose from the cold, tired and slept until 2 yesterday.

10:15am – our department meeting started late. I didn't talk too much in the meeting, partly because I'm still tired and undercaffeinated, and partly because I was interested in hearing what others had to say since I already knew what thoughts I'd been having on our work. It was pretty much all work, not social. After the meeting I asked a colleague a few questions about a project that was discussed briefly during the meeting, and sent an email to a colleague outside my department to schedule a meeting with him so I can ask him some questions about how course reserves work (this was also assigned to me during the meeting). The email was short and I'm afraid it was a little abrupt, but I don't really have a brain for social interactions just yet. I need coffee. About to tell my OTHER coworker that I'm going to get a coffee/bagel but we should check in afterwards about what we each worked on last week.

11:15-ish? I guess I interacted with the cashier at ERC. Not much to say. She didn't hear me the first time I said I wanted to use my free drink so I repeated it. I asked if they had any tomato bagels left and she correctly assumed that I did indeed want one. That's about it. Going to eat my bagel before touching base with coworker. In the meantime I will print my mockup and figure out what I want to say about it.

Do you want avoided social interactions? I want to go into the next room to say hi to a friend/coworker but I haven't yet because I came in late and need to do stuff for work first. I didn't realize we had a meeting at 10 because that's not regularly scheduled – my boss must have rescheduled it because I was out yesterday. So I actually came in at 10:05 today. Oops. Someday this week I'll have to stay late an hour to make it up.

12:40pm – Just got done checking in with my coworker. We showed each other what we'd each worked on this past week. We started looking up comparative examples too so at the end it kind of degenerated into a few minutes of fun with google ngram viewer. Other than that, again, it was mostly work. I told him what I'd done, he told me what he'd done, we commented on each others work. I think I commented on his more because he had more sketches, but we shared ideas, his sketches gave me ideas, I gave him some ideas, yada yada. Now I will finish my bagel.

I came back to my computer to find a chat from a friend waiting. Just a 'hi' basically. I said the equivalent back, she responded again and I'll respond to her later on as I'm working. I probably won't write about every single chat but I'll say how it went later on.

1pm – my other coworker talked to me about an allstaff email that someone else in the library sent about an event happening elsewhere on campus. He talked about how we don't really have guidelines about internal communications (he is a content strategist so this is sort of his thing). I can't say I really care that much about getting allstaff emails like this because they odn' thappen that often, so I didn't have much to contribute. He said that might be why some people take days to answer emails, but I told him that they might just get a lot of email, period.

Went to Askwith to get an audiobook – Harry Potter 5. I've been listening to it at home. Not sure if it's worth mentioning that I find audiobooks kind of social – they're more human than music, because they are a spoken voice and they feature conversations that happen between characters. There's character development and human drama. Lately I've been listening to a lot of these. They're good for design work, exercise, and household stuff. Not so good when I need to do something verbal, like write. If I do something while working, however, a lot of times it has to be something that's mindless or that I already know pretty well. Hence when I'm working at home I watch Buffy or How I met your mother or some other show that I've already seen, or listen to an audiobook I've already listened to, because it's comforting and companionable but it doesn't distract me. New things are more distracting.

Anyway I came back to a chat from my coworker that's just a design article. In the hall on the way to and from askwith I saw coworkers and sort of smiled and mouthed 'hi' but kept walking. On the way back I took the elevator instead of the stairs in part to avoid meeting anyone on the stairs and having to talk. Some of my coworkers are really chatty and I'm not in the mood right now. (Talking to my friend/coworker is different than talking to coworkers I don't know as well.)

1:13pm – I just read that post my coworker sent and responded that it contains an awful lot of cultural generalizations with no evidence backing them up. Here's the post: http://randomwire.com/why-japanese-web-design-is-so-different
I didn't want to come across as confrontational so I avoided using any –ist words. But yeah, that post is pretty … not great. I do want to talk to someone about the cultural generalizations there though, so I sent the link to a friend via chat. He and I often talk about racism and other social issues.

1:18pm – my content strategist coworker just asked me if I did anything else of note in California other than talking to the librarian there (which I had mentioned in the department meeting this morning). I told him about going to see sealions and how pelicans are stinky. And how I ran in front of a moving train (less risky than it sounds – it was about to stop and there was a special crosswalk for just this purpose. But still it was a little freaky. Not doing that again).

1:32pm – ok I went to chat with my friend. It was nice, I told her about my trip and how I randomly bumped into someone I knew on the plane back. I showed her this really creepy skymall item: http://www.skymall.com/thanks-for-everything-frame/HN5752.html
Leaving her office, I showed it to my content strategist coworker too.

1:35pm – my friend doesn't seem as struck by the weird cultural stereotyping in that article so now I am going to share it with someone else. = P

1:45pm – my friend stopped by while microwaving her food to tell me about a recipe she found that sounds tasty.

2:10pm – my coworker sent another article, this time about use of photos on webpages. I responded with some critique of the article but said they also have good points and thanks for sending it. I tried responding verbally at first, but he had headphones in and didn't hear me, so I typed in "they have some good points in that photo article but they definitely leave some stuff out too" in chat, and then he took off his headphones before I could type anymore and then we talked about it verbally. When someone else came in for a meeting with my content strategist coworker, I messaged a couple more things to the interface designer to continue the discussion without interrupting the others' meeting. After talking to him, I responded to my friend who chatted me earlier, and now I'm going back tow orkk.

2:21pm – when a friend's chatting noise distracted me, I answered her, then checked my email and saw an email of a presentation from a coworker. I am going through it quickly now and then going back to work. I checked in on my friend's chat response again but am not answering before returning to work.

2:43pm – heard a chat noise and saw my bf's name light up on gmail from the edge of the window I could see so I'm saying hi

2:56pm – chatted with bf again. It's easy to get sucked in when I have to go to my browser anyway (instead of omnigraffle) to look up how we currently do something on the site

3:11pm – realized I am hungry. I guess I should go get lunch. Man I swear I often work for longer intervals of time than it seems like today! Of course days like this are also fairly common. I guess there is a broad range that all counts as 'typical'.

3:34pm – we had a fire alarm just as I was going out. Talked to a couple people on the way down. Somehow I lost them and I was alone when I got out. I hesitated for a bit as to whether to wait for/find my coworkers or just go get food, but in the end I decided to just go get food and then I found my coworkers when I got back. Then we stood around chatting and I couldn't eat my bagel yet. They let us back in, but almost as soon as we got to the office the alarm sounded again. We all looked at each other.

As my coworker expressed it, there was some kind of group decision making going on – we in our suite looked at each other and across the hall, the people across the hall looked at us, and nobody moved. Eventually they made an announcement that this firealarm was a false alarm. So I went back to typing this. Now I will eat my bagel. Egg and cheese this time. Bagels are cheap. Oh I also had mentioned to my boyfriend over chat that I was going for food and told him about the fire alarm when I got back.

3:40pm – just emailed XXX that I am doing the prompt today, in case he had on his calendar to meet with me today. Not sure if he did or not.

5pm – I touched base again with my interface designer coworker and we talked about what we've done on mockups for today. Not much commenting on either end. I gave him one comment on his, he asked me what I was going to do next for mine and I told him. He had already said what he was going to work on as well. We talked about Axure a little bit – how we both think it will be useful for mocking up search stuff so we can demonstrate the interaction. But mocking stuff up in Axure might be a pain so I commented that at least for me I'm probably going to draw stuff outside of Axure first, while I'm just thinking about it, and then move it to Axure. We said we'll check in again tomorrow. Then the content strategist sent a link to Henry Ford innovation center as an example of a good carousel, so I went there and commented out loud that I liked it. I also mentioned that I liked the way for the smallest screen size they just cut out the gutters and have the text go all the way to the edge of the page. He didn't know what I was talking about so I went over to his computer and saw that he was zooming out rather than resizing his browser.

5:10pm – director of communications just walked in to meet with my boss and coworker for smoething or other. I said hi.

5:30pm – Right before leaving I went and chatted to my coworker/friend.We were the last two in the office. I asked about her cat, she mentioned that it ws the second time today I was asking about the cat, I said I want a pet, and told her about a Doberman decal my bf got me. I told her about my new living room arrangement. We left the office together (I'm writing this later).

7pm – got back from grocery shopping and chatted up my bf about what I got (it's something I just made whie in CA – it was good so I' making it again). Listened to some vmail and delted it – not sure if that counts as a social interaction. One was a recruiter, one was from my dad and it was old. Now probably going to chat lightly with bf while I cook. Also just got email from XXX and responded.

7:54pm – my mom called as I was finished up cooking. Nothing really to say, just checking in since later this month I'm going home for my sister's wedding. We talked for about 10 minutes. I told her I rearranged my living room and she wanted to make sure it wasn't because I was stressed. (It wasn't.) She asked about how things are going at work and I told her that the main cause of my stress right now is projects outside of work. Then I got back to my computer with my food and saw a chat from a friend. I'm telling her about my nachos. I'm telling my bf too. Oh and I responded to XXXs email.

7:59 going to webcam with bf

8:49 still webcamming with bf. Will continue for a while and then possibly have some minor communication in a google doc with a collaborator on an external project. But after email communication with XXX I am ending this.

Appendix E: Post Diary Study Interview Questions

Intro

- Thank them again for meeting with us and completing the study
- Today's purpose: talk about the exercise you completed, get a feel for your thoughts/experiences, and to give you a debrief of our study
- assure everything is confidential

- Tell us about yourself
    - Age
    - Home Town
    - Native Language
    - Computer Usage
    - Phone Usage and Phone Type
    - Do you currently track body data in any form - Sleep etc.
- Take me through your strategy/process when you were completing this exercise.
    - How did you approach it?
    - What sorts of things drove your decision to approach it the way you did?
- Tell me more about this artifact you've created.
    - How did you decide to track things using the method/artifact that you did?
    - What were you thinking when you did XX?
    - What does XX mean?
- What were some of the most important things for you to note down when completing this exercise?
    - Why were they important to you?
    - What were you thinking when you were noting these things?
    - Could you rank, in order of preference, what were the top 3-5 most important things you noted down?
- What sorts of things did you consciously decide not to keep track of?
    - What made you decide not to keep track of those certain things?
    - Why were these not important to you?
- Did you gain any insights about yourself when completing this exercise? (social)
    - If so, what?
        - What do you think you will change after gaining these insights?
    - If not, why not?
- Overall, what are your thoughts about this study?
    - What were some of the more interesting parts about completing this data?
    - What were some challenges involved in collecting this data?
        - Why were those things challenging?
        - What would have made those things less challenging?
- If you were to do this exercise again, what would you do differently? The same?
- What did you think about completing this study over the period of 1 day?

        - Too long? Too short? Just right?
        - How long do you think it necessary for you to gain meaningful insights? why?
- Was there a point where you started becoming tired of keeping track of these things?
    - If so, please tell me about it.
    - If not, why don't you think so?
- Would it be ok for us to contact you with any follow-up questions, if necessary?
- Do you have any follow-up thoughts, comments or questions about this study?

If interviewee asks "What is your project all about?" or "Why are you conducting this study?"

- We are working on a project for this year's Student CHI design competition that helps individuals track, understand, and manage their everyday social interactions
- Why? Because social health/sociability is closely tied to many other aspects of life: happiness, physical health, mental stability
- So far, there are lots of studies surrounding how human social behavior informs group behavior and collectives, but almost none surrounding how knowledge of one's own social interactions might benefit an individual/translate into self-knowledge and self-change.
- Your participation will provide us with valuable insight as to how individuals think about and characterize their personal, everyday interactions with others.