Designing for Future Technologies
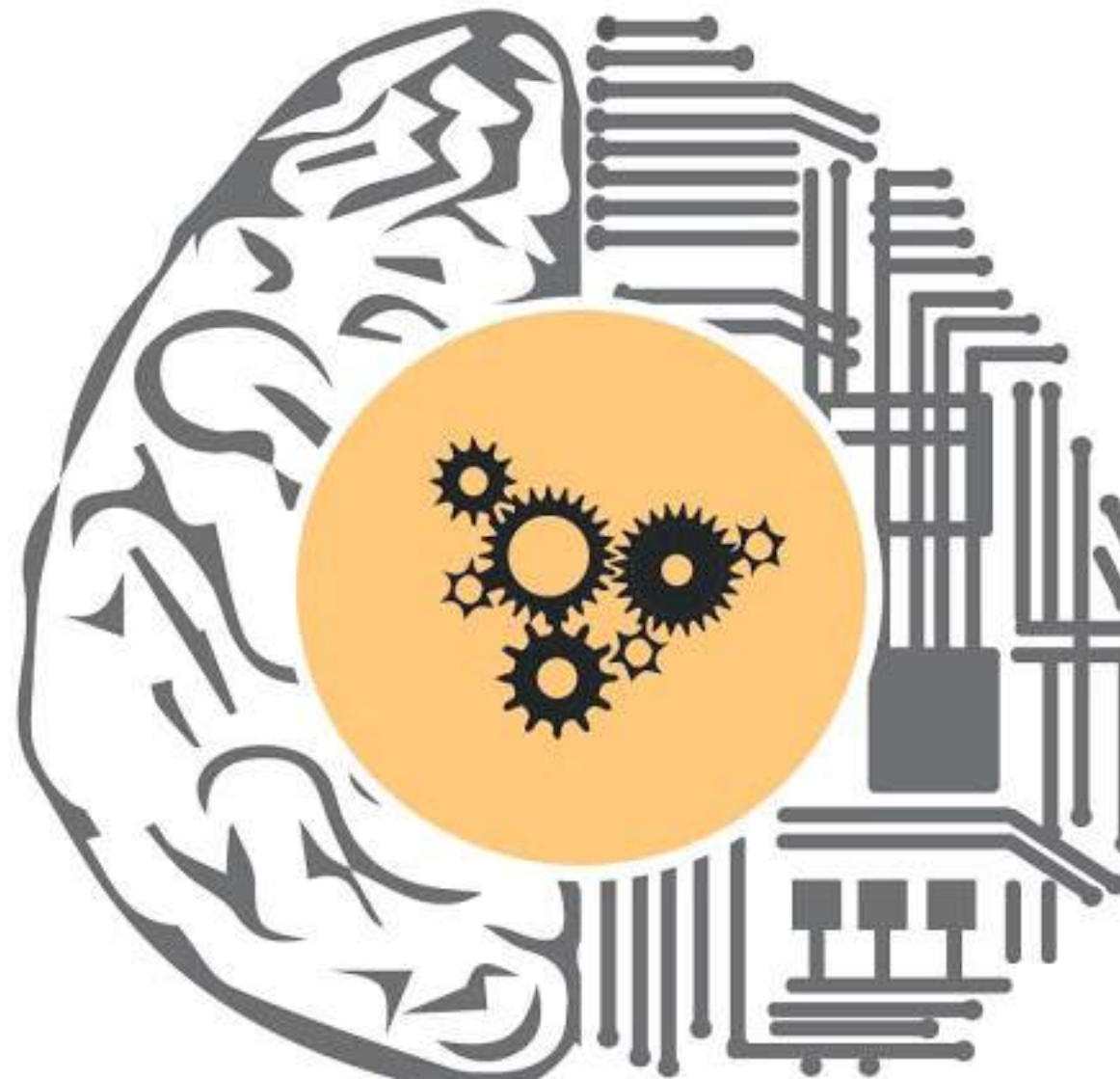
How to design when we've surpassed wearable and handheld devices through participatory design

Clark Mullen
Prianka Rayamajhi
Melissa Tang
Jiaqi Li

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Overview

Introduction

Polyamory has existed throughout human history as an alternative lifestyle and has often had negative associations. Polyamory or "many loves", is defined as "the practice, state or ability of having more than one sexual loving relationship at the same time, with the full knowledge and consent of all partners involved."[1] (Include Polynexus Citation) Monogamy is currently the dominant social construct of most religions and cultural norms, and therefore many polyamorous people keep their lifestyle hidden in fear of social rejection or even some cases, legal issues. Through our research, we learned that the internet has played an integral role in connecting polyamorous people. Technology has provided access to the world at one's fingertips, enabling polyamorous people to find each other through a variety of dating websites, Facebook groups or meetups, classified ads such as Craigslist, and many other social platforms. According to researcher Justin Garcia from the Kinsey Institute, in 2013, for the first time in human history, more people started relationships by meeting online than in person.

While monogamy is defined as an exclusive relationship between two individuals, polyamory is loosely defined and has many sub categories[2]. Polyamory is so complex, analyzing the data was very challenging. Through our analysis, several themes emerged in our research as we began to explore intimacy in polyamorous relationships. Through interviews with members of the polyamorous community, literature reviews, consultation with experts in this field, our analysis identified several problem spaces. Most of these areas will be explored further with our research: privacy in openness, communication, jealousy, time management, roles & hierarchy.

Our Participants

Because our research topic is intimacy within the poly community in Bloomington, we recruited participants who are either members or researchers in this community. Due to the sensitive nature of the topic we chose not to use the real names of our participants or use identifiable information unless they gave us their consent. Below is a description of our participants.

E is a writer. She comes from an intellectual family and has a strong interest in academic writing. She is very open-minded and is an activist in the Bloomington community. We recruited E because she is a young woman that has explored polyamory with her partner for a few years. She idealizes polyamory but has had little success in the community. She is open to polyamory but is not actively seeking out members of

the community and claims she has rather an emotional and idealized view of polyamory. She described the difference between her 'fantasy' of poly lifestyle and the reality she has experienced in her attempts at polyamorous relationships.

J is a young male graduate student in Indiana University. He has been in a polyamorous relationship for more than a year. His interest in polyamory began when he witnessed his roommate's happy and successful polyamorous relationship. This encouraged him to explore polyamory. Some of his partners didn't work out long term, but he has a stable primary relationship with N. He has very open communication with his primary partner and informs her of his additional partners. He has a very philosophical viewpoint regarding polyamory. He has no connection with any polyamory communities including the local and online communities, because he doesn't want to meet just poly people, rather he's interested in people that he meets through his regular routines. His non primary partners can vary from sexual partners to very close emotional friendships.

M is a graduate student at Indiana University. Most of her relationship has been polyamorous since the age of fourteen. At the age of 18, her boyfriend and her fell in love with a male and became a polyfidelous triad for over 10 years. They share 3 children together and have equal custody of their children. Through their divorce, one of her ex husbands is still practicing polyamory while her other ex husband does not identify with the polyamorous lifestyle. M is still polyamorous and does not envision ever being monogamous.

Justin Garcia is a researcher at the Kinsey Institute. He studies how culture and technology contextualize and shape our understanding of sex, romance, and intimacy. He has done research on how mobile technology has changed sexual encounters. He said that "the most consistent feature of human sexuality is the remarkable diversity which exists among individuals and cultures."

Footnotes:
1. Zell-Ravenheart, Morning Glory, http://www.polynexus.org, accessed April 8, 2014.
2. Please refer to the appendix for terminology definitions.

Methodology

Our Purpose

The focus of our research is to explore intimacy in polyamorous relationships. Because of the complexity in the polyamorous relationship dynamics, the lack of research in this field, as well as the definition of polyamory encapsulating many forms and kinds of relationships, technology has barely scratched the surface of design for this community. We aim to explore how we can utilize technology to design better tools to facilitate polyamorous relationships. Through a people-centered design approach, our aim is to engage with our participants throughout the entire design process. By utilizing people-centered design approach, we can identify commonalities amongst the complexities in these relationship dynamics and design for our problem owners.
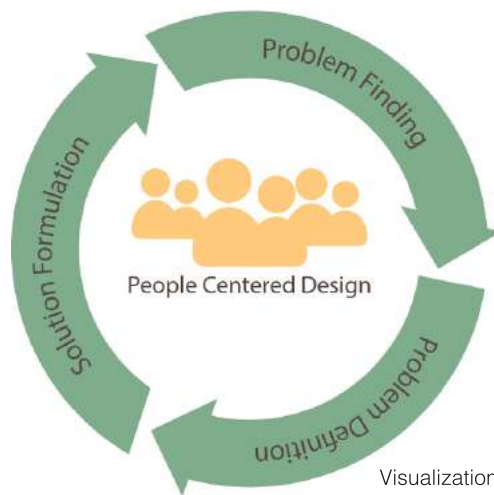
Visualization of people centered design

The lens we are utilizing to conduct our people-centered design approach is through the practice of bio-hacking. Bio-hacking is the practice in engaging biology with the hacker ethic.[3] This research will only utilize bio-hacking in theory within the context of the Internet of Things to anticipate future technologies. Our participants have little to no understanding of bio-hacking, so developing a futuristic scenario will enable them to design through ideation and build radical ideas. Through this session, our participants who practice polyamory but have different interpretations and negotiations in their relationships will work together to develop unified solutions of communication through future technologies. We have developed an ideal futuristic scenario in which nanotechnology can be embedded inside the user as they are now the size of cells. This enables the co-creators to develop technologies that are highly imaginative and creative to better communicate their internalized values, emotions, and needs.

Our Process

Dealing with this problem with a people-centered point-of-view, we adopted an iterative design process from Min Basadur's Simplex Design Process that includes three main stages: Problem Finding, Problem Definition, and Solution Formulation. This process includes several phases from problem finding, fact finding, problem definition, ideation, to evaluation and selection[4]. Below is a brief overview of this design process through our research..

>> **Problem finding-** In this stage, we conducted preliminary literature reviews to determine what areas we wanted to explore. We generated a list of topics that interested us and researched these topics further. We chose criteria that we thought best would meet our needs to converge on this list. Some of the criteria included accessibility to participant pool, general interest in topic, and time. We narrowed our research to the polyamory community.

>> **Fact finding-** We conducted further literature reviews on the topic, consulted with an expert in the field, and interviewed 3 members in the poly community.

>> **Problem definition-** Through affinity diagramming, we analyzed our data to generate problem spaces. While there was no definite problem space that jumped at us, there were quite a bit of areas that had something going on but we were not quite sure what it was.

>> **Ideation-** Through a future participatory design workshop, we were able to utilize our new method "Body prototyping" as well as a brainstorming method. We also incorporated a scenario in which we could introduce the concept of bio-hacking.

>> **Evaluation & Selection-** Once the participatory design session concluded, the outcomes from this session were tested with someone in the poly community that did not engage in the participatory design. This enabled us to test and eliminate some of the concepts as well as further develop some of the concepts based on the participant's feedback.

Footnotes:
3. Wikipedia, http://en.wikipedia.org/wiki/Biohacking, accessed April 15, 2014.
4.Basadur, M. "Simplex®: A flight to creativity." Buffalo, NY: Creative Education Foundation (1994).

PROBLEM FINDING

FACT FINDING

PROBLEM DEFINITION

IDEATION

EVALUATION & SELECTION

| MILESTONE	MILESTONE	MILESTONE	MILESTONE	MILESTONE
Week 1	Weeks 2	Week 2.5	Week 3	Weeks 3
DISCOVER PROJECT TOPIC	INTERVIEWS AND CONSULTATION	EXPLORING PROBLEM SPACE	PARTICIPATORY DESIGN	EVALUATE WHAT WE LEARNED FROM PARTICIPATORY DESIGN
We listed various topics of interest that we wanted to explore. We developed a criteria that fit the project scope and timeline. Finally, we chose to design for polyamory group in Bloomington. Through literature reviews, online academic sources, and a visit to the Kinsey institute, we were able to furthur explore this interesting topic.	We had interviews with four polyamorous people. In addition to this, we consulted with Justin Garcia, a professor who is doing related research at the Kinsey Institute.	Once we gathered enough qualitative data, we used the affinity diagram method to help us identify the potential problems among the polyamory community.	With much care and consideration, we prepared the participatory design future workshop, did a pilot study and conducted the design workshop. We incorporated our new method that we developed called "Body Prototyping".	Our participants developed several concepts through the participatory design session. After the session, we conducted an interview with a member of the polyamory community. She helped us to evaluate the ideas and helped us converge on some key design concepts for this community.
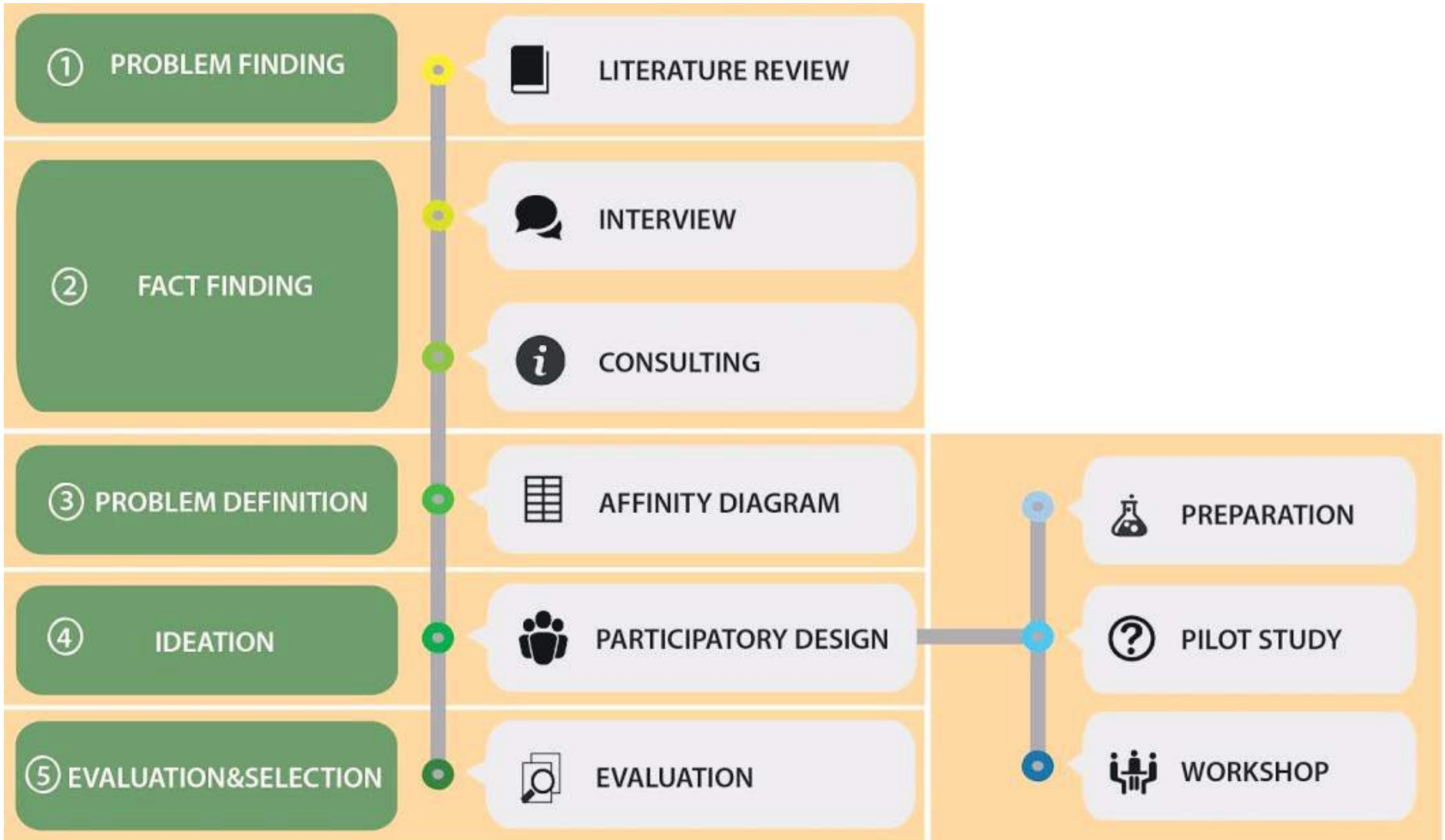
Framework for our Methodology

Literature Review and Justin Garcia

We conducted secondary research in order to get a handle of vocabulary and practices in polyamory. Because polyamory is not the dominant social construct and is considered "taboo" by many conservative groups, privacy is critical for our participants. Having a handle on what kinds of questions to ask and what is appropriate is crucial in building rapport with your participants, especially in participatory design. Our literature review enabled us to learn very basic vocabulary as well as ask questions that would be appropriate for this target user group. From secondary research, we were able to articulate varying relationship dynamics and situations that a member of the polyamorous community might have engaged in. A document[5] generated from a class Cherie and Franklin directed a class directed by Cherie Ve Ard and Franklin Veaux at Florida Poly Retreat 2006) listed several terms from the polyamorous community. Another book written by … documented the story of a real life polyamory relationship through the author's own journal. We summarized the terms into the following categories:

>> **Emotion:** "Jealousy", "Compersion (Definition: the feeling of taking joy in the joy that others you love share among themselves, especially taking joy in the knowledge that your beloveds are expressing their love for one another. The term was coined by the Keristan Commune in San Francisco which practiced Polyfidelity, Kerista disbanded in the early 1990's)"
>> **Role:** "Intimate Partner", "Partner"
>> **Relationship status:** "Open relationship", "Secondary relationship", "Closed relationship", "Polygamy"
>> **Rule:** "Condom Commitment", "Safe Sex"

From 'Polyamory: Roadmaps for the Clueless and Hopeful', a book by Anthony D. Ravenscroft, we had a general understanding of how poly people dealt with jealousy, how they might arrange finances, how family might understand and react to their lifestyle, how they work out their schedules with their multiple partners, etc.

In our interview with Justin Garcia, a researcher from the Kinsey Institute, he described that polyamory has been practiced since the dawn of human civilization and while has been considered in the past few centuries as a taboo, is a growing phenomena. Interviewing a researcher from the Kinsey Institute allowed us to get further background information on the history of polyamory as well as how technology plays an important role in modern relationships. Garcia informed us that last year was the first time in human history that more people met through internet dating than in person. This was a huge insight for us, technology shapes our interactions with people in such a way that it surpasses biological interaction in this instance. In addition to this, technology has enabled people to explore their sexuality. Through internet support groups and meetups, people are able to engage with others who might share in their desires and lifestyle choices.

Semi Structured Interviews

We chose semi structured interviews as our fact finding method in order to find potential problem spaces in the context of intimacy in polyamory. Listening to personal stories and specific details about people's experiences helped us gain a rich understanding of this community. We learned what intimacy means in the modern age in the context of the poly community in Bloomington. From several interviews, we developed a deep understanding of the diversity and complexity of this community as well as the hardships they endure because of the societal structure and acceptance from the general community. We discovered through our research different attitudes, behaviors, motivations and goals that exist in the Bloomington poly community.

Experience Mapping

When we completed our fieldwork, we were unsure of the lens we wanted to use for our research due to the complex nature of polyamory. We did not have a clearly defined problem area at that time. The way that we constructed the method seemed like it would generate more fact finding data. Once we developed our participatory design session, we decided against experience mapping as we no longer needed generative data, as we were approaching ideation and prototyping.

Footnotes:
5. http://www.morethantwo.com/poly101.pdf

Affinity Diagramming

We used the affinity diagram method to help us identify the potential problem spaces in the polyamory community. Through affinity diagram, we analyzed the data from four interviews, the consultation from Professor Garcia and a facebook reflection based from our interview with E. We grouped the data into the following categories:

>> **Others**
>> **Communication**
>> **Community**
>> **Struggle**
>> **Attitude toward monogamy**
>> **Modern poly**
>> **Definition**
>> **Identity**
>> **Technology related to this area**
>> **Rules**
>> **How do they start to be polyamorous**
>> **Goals**
>> **Motivation**
>> **Jealousy**

Finally, after discussion, we narrowed them down to these topics:

>> **Communication**
>> **Privacy**
>> **Jealousy**
>> **Schedule**

Participatory Design Workshop

Intro
- Intro of our research
- Play a video as inspiration
- Get permission of non-identifiable video from participant

Warm up
- Introduce "Think aloud"
- Brainstorm through five senses to communicate "break up"
- Act out the idea from brainstorm and critique

Body prototyping
- Introduce the method and provide scenario
  - Scenario 1: Sharing time
  - Scenario 2: Privacy
  - Scenario 3: Jealousy
- Develop the device on your body
- Act out

Discussion

Visualization of how we constructed our Participatory Design Workshop

Body Prototyping

Our Motivation

Modern polyamory is just now being researched and is still a very experimental topic in human computer interaction. This is an interesting and challenging design space because there isn't much existing research to guide our design process and privacy issues make recruitment more difficult. This may cause difficulty for designers as well as participants in the polyamorous community. We aim to develop a new method to engage our participants in design scenarios based on our data from previous research. We want our method to empower them to design for themselves.

Participatory Design Framework

Because of the richness and diversity of data from our initial interviews it was difficult to generate design directions while keeping them grounded in our initial research. Therefore we wanted to involve our participants from our interviews in the design process and have them collaborate with each other to develop design implications and prototypes. Participatory design allows people with diverse perspectives to collaborate through an interactive design process. The new method we developed for this project was influenced by the work of Jungk and Müller and their future workshop perspective. Future workshop is a technique to enable people who are not typically implementers or decision makers to take part in the decision making process through brainstorming and ideation.[6] The framework has four aspects: 1) Brainstorming, 2) Fantasy, 3) Critique, 4) Implementation. In addition to using the Future Workshop, we also incorporated concept sketching, evaluative methods, and our new method Body prototyping, which we discuss below. Using participatory design allowed our participants to come together to create designs that would be effective for the diversity of practices found within the polyamorous community. Using data synthesized from our affinity diagram of our initial interviews and literature review, we chose the theme of communication as our problem space/design opportunity for this project.

What is Body Prototyping?

The new method we developed for this project is called Body prototyping. Body prototyping is a new participatory design method where the participant's body becomes part of the prototype. Participants use their body as a design platform and modify it by adding materials to simulate the technology or design. The participants act out scenarios using the concepts they have developed and prototyped. Body prototyping helps them to be more engaged in the design scenarios.

Pilot Testing/Method Development

Because Body prototyping is a new method, we piloted a shortened version of the method with two participants to identify potential issues before we deployed it. We began the pilot session with a brief introduction of our research project, intimacy in the modern era. We set the context of the participatory workshop by showing a short video on future communication technologies and described that the workshop would focus on communication technologies in futuristic scenarios. We started the session with a warm up to start making our participants think about future non verbal communication technology. We provided them with a scenario of having to breakup with a partner without using any current technology (i.e. phone, computer) or speaking. They had to use one of the five senses to communicate the breakup. Smell, touch, taste, sight, hearing. We gave our participants two minutes to create a concept for each sense. We then asked them to spend five minutes to develop and sketch a communication concept. While participants sketched concepts, the research team suggested aspects to keep in mind. After completing the sketch we asked them to prototype the design on their body using the materials we had provided. After the prototypes were completed we provided them with a scenario and asked them to communicate using their prototype.

Pilot Evaluation

After completing the pilot session the researchers and participants did a short debriefing to evaluate the method. We identified three issues:
1) having participants work alone to develop concepts during the warmup session didn't promote collaboration.
2) Without providing clear scenarios for participants during the design process the concepts they developed and prototyped didn't necessarily allow for them to communicate with each other because they addressed different aspects of communication.
3) Participants needed more context for the futuristic technology scenarios. We wanted them to think beyond wearable technologies and develop concepts in the framework of bio-hacking and the internet of things. Because we didn't communicate this clearly participants developed wearable technology concepts instead of technology integrated into their bodies.

Footnotes:
6. Greenbaum, Joan, and Kim Halskov Madsen. Small changes: Starting a participatory design process by giving participants a voice. Lawrence Erlbaum Associates: Hillsdale, New Jersey, 1993.

To address these issues we made the following changes to our Body prototyping method.

1) To promote more collaboration between participants in the warm up/ideation phase of the workshop we had participants think aloud as they generated ideas on how to use different senses to communicate a breakup. As they thought aloud the researchers wrote the ideas on a whiteboard. This helped the participants feel comfortable with each other and the researchers.

2) To provide more structure to the method we gave them scenarios based on our primary research before they developed and sketched a concept (see scenario section below). This kept their ideation grounded in research and focused on addressing an actual situation. Because both participants generated concepts based on the same theme, this promoted collaboration and communication between participants during their design process. It also allowed them to communicate using the design they prototyped because it was focused on the same aspect of communication (Sharing Time, Privacy, Jealousy).

3) To make our participants think beyond the scope of apps or wearable technology we provided them with an imaginative futurist scenario. They are now living in the year 2114. Monogamy is no longer the dominant relationship status. Polyamory has become dominant and efficient communication is essential for managing the increased complexity of many simultaneous relationships. Technology has radically developed in the last 100 years. Society has moved away from separate digital devices and wearable technology, which are now seen as antiquated and inefficient. Technology has become so miniaturized, computers are now the size of human cells and are completely integrated into our bodies. The mass adoption of nanotechnology has given us capabilities that were before seen as unimaginable. People can now communicate with each other using the technology integrated into their body seamlessly and efficiently. No longer any distinction between technology and human. Almost anything you can imagine is now possible. It is up to you to determine how people can communicate with each other nonverbally using this technology.

Body Prototyping Scenarios
To guide our participants during our workshop we provided them two different scenarios in three different themes:

>> **Sharing Time:**
(a.) When you are with your partner, he/she is texting with secondary partner, while it is your time. How would you communicate with him/her that this is inappropriate?
(b.) Your secondary partner wants to go on a date with you next Tuesday. But, you are already going on a date with someone new at that time. How would you communicate to your secondary that you are booked?

>> **Privacy:**
(a.) You have to communicate with your partner that you don't want them to share your secret to their other partners.
(b.) You have to communicate with your secondary partner the secret.

>> **Jealousy:**
(a.) You are jealous of your partner's new date, how do you communicate that you are insecure about this situation?
(b.) Your partner's secondary partner makes you feel very uncomfortable and uneasy. How can you communicate with your primary partner about this issue?

Body Prototyping Preparation
We prepared for our Body Prototyping session by booking a large private room in Wells Library. Before our participants arrived, we wrote on the whiteboard the session schedule (see appendix for session outline), goal, and keywords. We also drew pictures on the whiteboard welcoming our participants. We also prepared food and drink for participants. We separated the room into a prototyping area and sketching/brainstorming area. We set up the prototyping materials (see appendix for materials) on a large table. We laid out the design prompts, paper, and sketching materials.

How Body Prototyping was used
We used our participatory design method, Body prototyping, to empower members of the Poly community in Bloomington to come together and develop design concepts in the context of bio-hacking and the Internet of Things to enhance communication for people in polyamorous relationships.

What's good:
After the workshop, we asked the participants about their experience in this workshop. Both of them claimed that the warm-up session was really helpful for the later prototyping session. They both felt that they did not have any clue how they can contribute ideas. But as they tried more, more mature ideas came out and they became more confident to design and present their ideas.
Acting out the scenarios using the prototypes they developed allowed participants to quickly see how the design would work in practice interacting with another individual.

What's bad:
One of our participants feedback was the scenarios were too specific and therefore made it more difficult to relate to it. The participant would have preferred if we would provide more general themes, and he could use scenarios from his own experiences that fit within that theme. This would allow to keep the research focused, but make it more personal. Our rationale to structure the scenarios resulted from how structured the future workshop was conducted in the Greenbaum article. Perhaps with more testing, Body prototyping can have a less structured approach.

Data Analysis & Conclusion
In this project we explored intimacy in the modern era within the Data analysis and conclusion:
In this project we explored intimacy in the modern era within the context of the polyamorous community in Bloomington. We adopted Min Basadur's Simplex Design Process to structure our research and design process into three main stages: Problem Finding, Problem Definition, and Solution Formulation. Because of the diversity of this community, problem finding and problem definition was challenging. There was no commonality among our interviewees that pointed towards obvious design directions. General themes did emerge after we synthesized the data from our primary and secondary research including: privacy in openness, communication, jealousy, time management, roles & hierarchy. From our data synthesis we developed the following questions we wanted to answer.

1. How is privacy managed in an open relationship? How do they maintain privacy in open relationships and what level of privacy do they need to keep?

2. Communication is key in a polyamorous relationship, especially with primary partners. Negotiations and rules need to be made and followed so as not to cause distress in relationships and keep metamors and primaries comfortable around each other. How does technology play a role in their communication?

3. How do people in polyamorous relationships manage scheduling their time with multiple partners? What type of tools would enable better scheduling in polyamorous contexts.

To help us answer these challenging questions we recruited members of the Bloomington Polyamorous community to participate in an interactive design workshop. Through brainstorming, sketching, Body Prototyping, evaluation, and discussion we hoped to bring together diverse members of this community and have them collaborate to develop design concepts and prototypes addressing the challenges and opportunities of this unique community. The workshop was very successful. We learned more about issues surrounding these questions through the design concepts they developed. Below are the design insights we gathered from our participatory workshop.

Privacy
>> Although many people in the polyamorous community have very open relationships, privacy is still important.
>> After analyzing the design concepts developed by our participants we found that although our participants are willing to share personal data with partners, they need to be able to control information.
>> We learned that in polyamorous relationships partners may have different privacy requirements for each other. Its important to support different privacy levels for multiple partners.
>> Privacy needs change throughout the day and this can be difficult to communicate with current systems. One of the participants developed an aroma concept to communicate if she wanted to be left alone/what level of privacy she wanted to have.

Communication
>> Through the discussion, we found that communication plays an important role in a polyamorous relationship.
>> Through the participatory design workshop, participants developed many ideas. During the evaluation session, they both said, these designs are not limited for poly people. They can also be used by monogamous people.

>> After analyzing the designs two participants developed, we found that they care about how to communicate effectively. For example, they are both interested in how to express many subtle emotions with five senses. Because only languages usually cannot describe these things very well. Another point being mentioned is that sometimes text message can not be immediately responded. This also reflects the the effectiveness.

>> During the discussion session, one of the participant mentioned about the different ways people communicate and this can influence how your information will be perceived by other people. If two people have really different ways to communicate with other people, the information might be distorted. Communication should be able to convey the right information.

Scheduling

>> Many polyamorous people currently use shared online calendars to manage time with multiple partners.

>> We learned that current calendar system of simple yes/no for availability can cause tension between partners.

>> One of the design concepts developed during the session was a calendar that communicated availability in more emotional and nuanced way using smell, color, and sound.
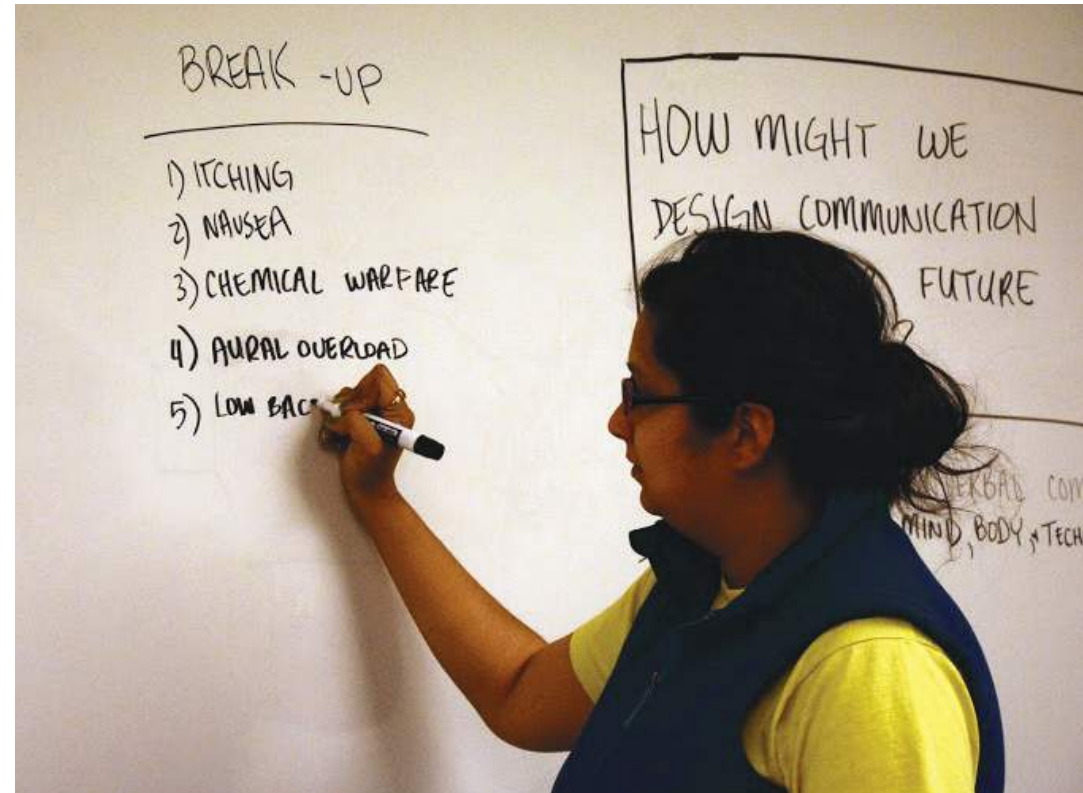
Design Directions

Future Technologies for Polyamorous Relationships

Our workshop was framed within the context of bio-hacking and the internet of things. We wanted our participants to think beyond devices or wearable technology and therefore provided them with a futuristic scenario to make them think imaginatively about communication technology. We described that they were now living in 2114 and nanotechnology had advanced to the point where computers were the size of human cells. Wearable technology was now viewed as antiquated and inefficient compared to communication technology integrated into the human body.
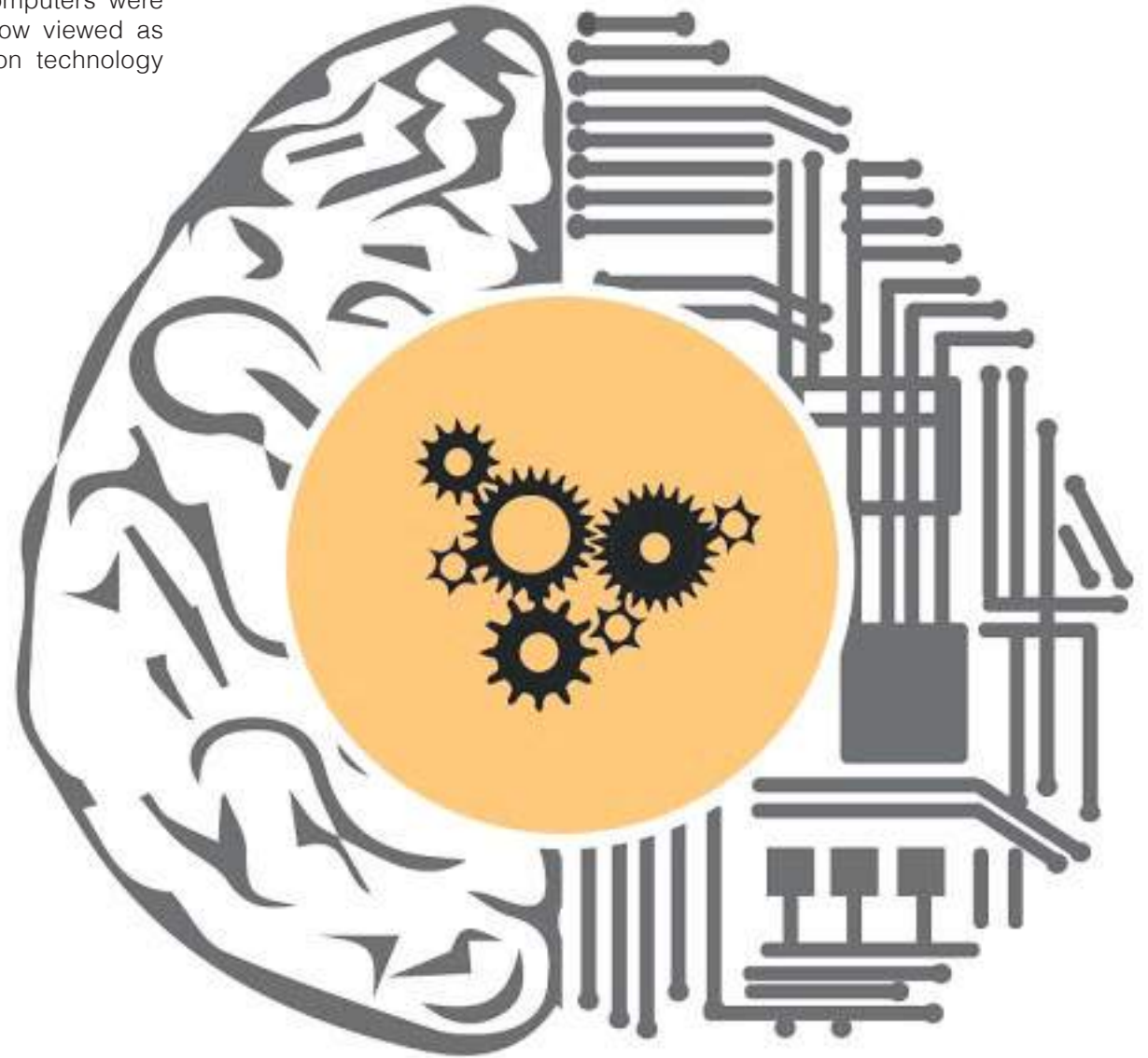

Illustrating future technologies through biohacking

Chair raises or lower based on conversation engagement

N's opinion can help can modify the design generated from the PD session. Instead of raising or lowering the chair, which will make both of them aware of the issue, a design that can allow only people in this conversation to know the awkwardness. The chairs around one table are connected together. Once one of the people who sit on the chair feel awkward, which indicates that the topic is making someone uncomfortable, the chairs can send a little vibration to the edge of chairs. But they will not know who feels awkward in the conversation. This can keep privacy while help remain openness.

When we embed technology into body, we don't need a chair to convey any information anymore. When someone in the conversation feels awkward about the topic or this topic can not interest him/her, the skin color of all people involved in the conversation will become green.
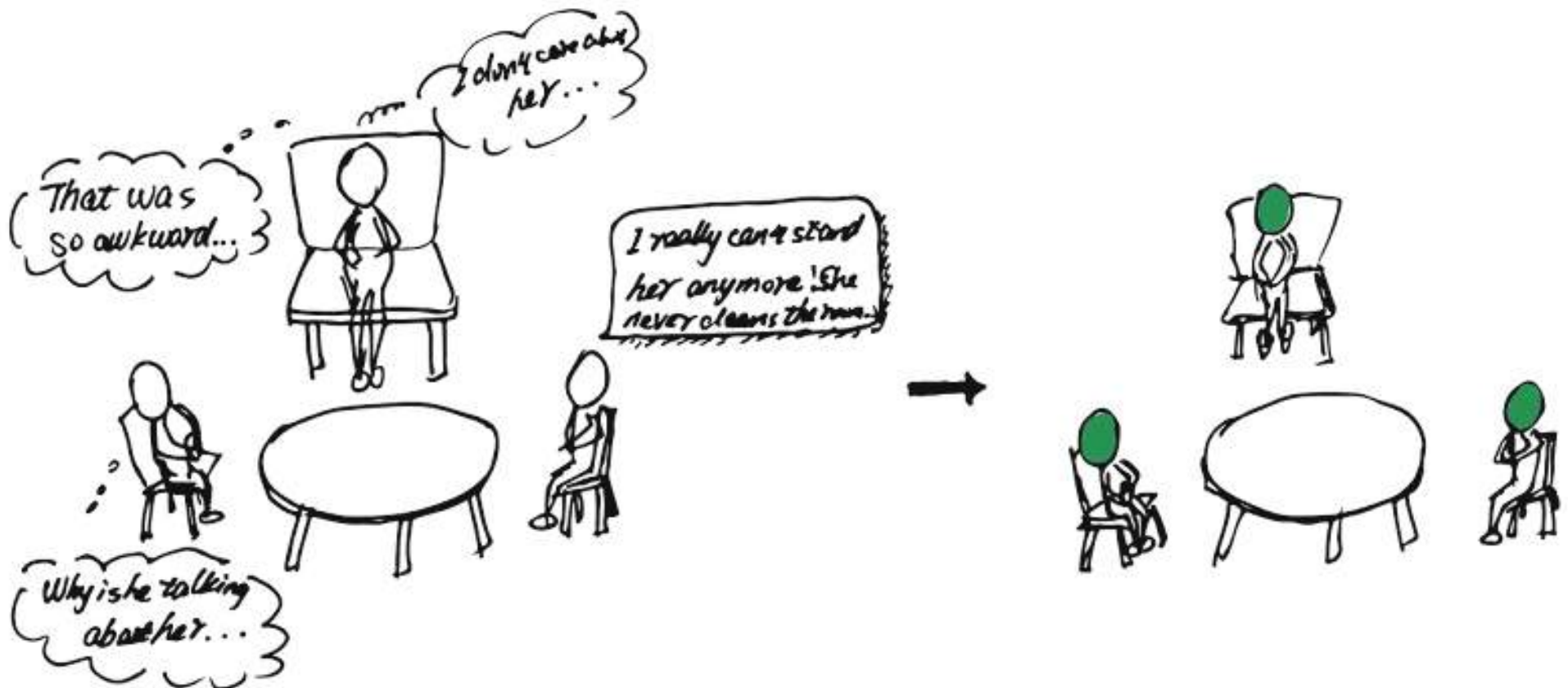
Aural Overload

Sometimes it is difficult to break up with your partner, even though you know it will be best for the relationship to end. The Aural Overload is a solution to motivate the user to break up with their partner. The Aural Overload creates an aural sensation inside the ear canal that starts as a basic hum as a response to the user procrastinating on not breaking up with their partner. As they keep procrastinating or changing the subject, the aural sensation creates an unpleasant background buzz that makes the user have difficulty in concentration. This device is microscopic and is implanted into the user's body and can recognize the user's responses and decision making process. Once the user makes the firm decision and follows through with their break up, the background buzz becomes less and less intrusive to the user and allows them to make solid and thorough decisions.

This concept was generated through the brainstorming session in our participatory design future workshop. Our participant E decided that having a device that can affect "hearing" will force users to follow through on difficult decisions like breaking up with their partner. This would help users go after what they want rather than feel indebted to a relationship that they no longer want to be a part of through guilt or other issues.
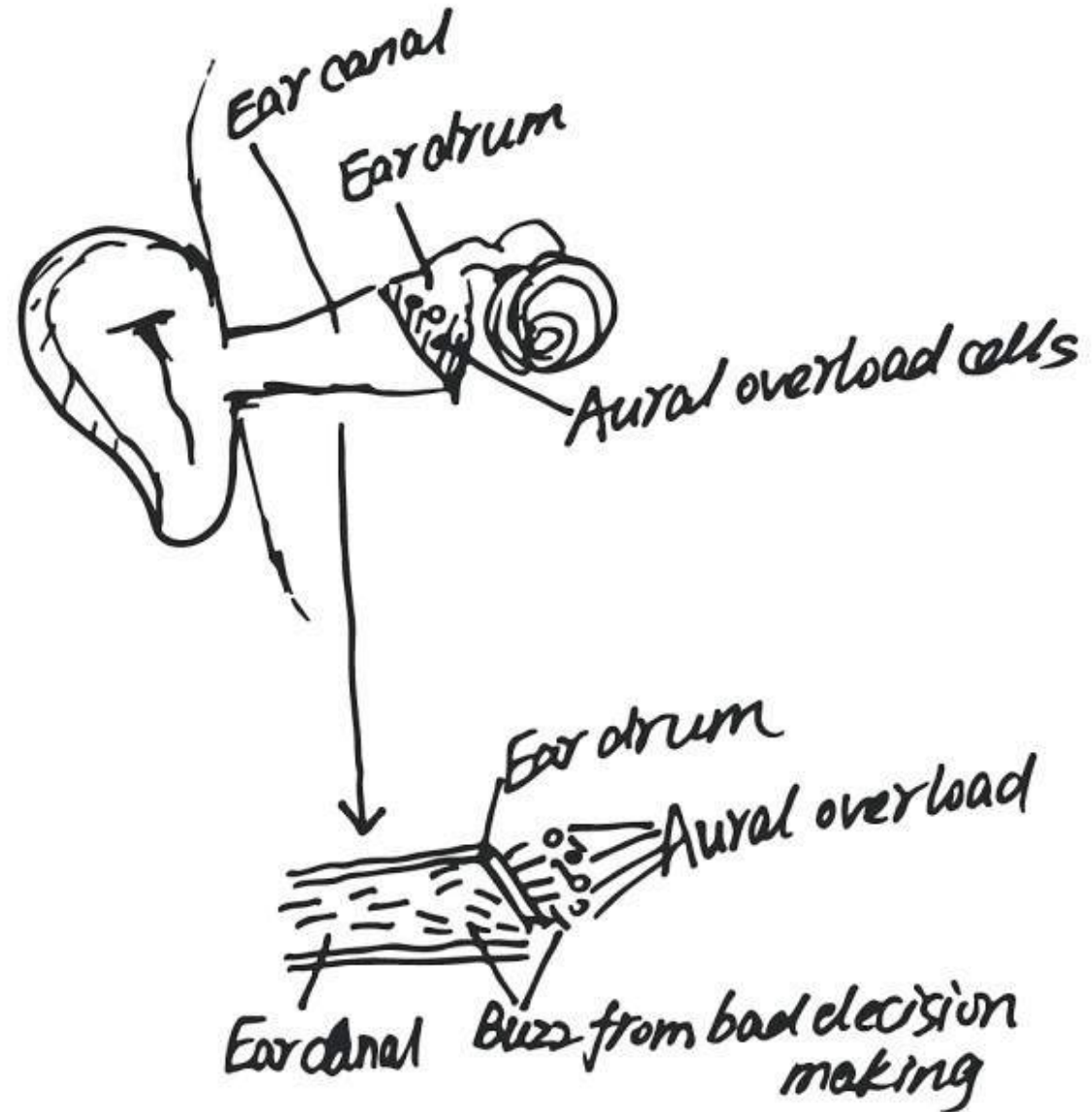
Wild Tiger Smell/House welcoming aura

(This is my territory, don't talk with me)

Smell is used here to communicate with each other. For example, when you want to inform that you don't want to be disturbed, you can produce the smell of a wild tiger. Wild tigers usually produce scent which warn others that they are living within their own territory. The scent serves as a way to inform. Another example is house welcoming aura. When your lover comes back, you can make some nice aura to welcome them. Through aura, we can transport information and express ourselves. This idea came from our subjects during the workshop, but later another member from polyamory community critiqued the idea. She think the idea only transport the information that she don't want to be disturbed, but it misses the point of convey that she's busy. Also, she don't like to communicate through smell because it will affect the other people.

When scheduling times with multiple partners it can be difficult to get an intuitive sense of what times are appropriate without asking directly and potentially causing tension. This design concept allows communication about appropriate times that are more emotional and nuanced. Instead of simple yes no to a proposed date, appropriate times are communicated with color, sound, or smell. After they get general feedback about proposed time using this system they can then schedule a specific time with existing calendaring solutions.

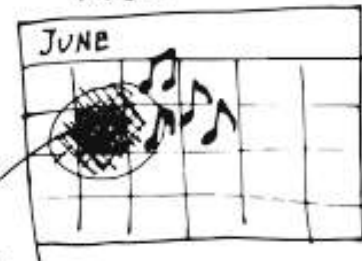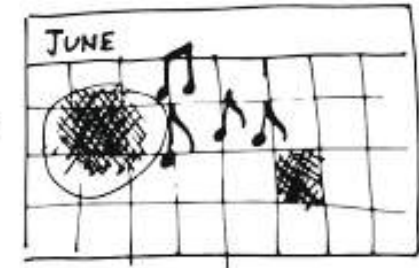POLY CALENDAR

JUNE

COLOR

JUNE
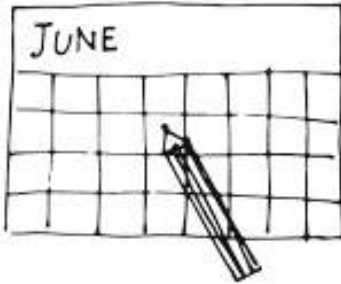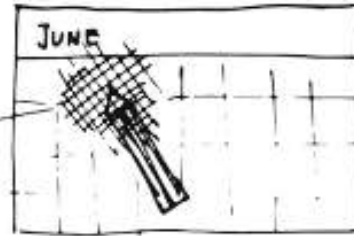
Glow
WHEN HOVER
OVER GOOD
TIME

A REJECTION TO A PROPOSED TIME CAN BE TOO BINARY. YES/NO.

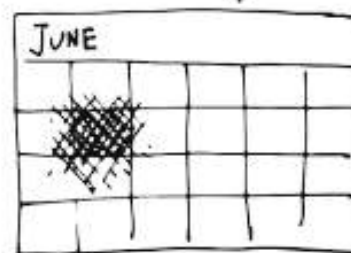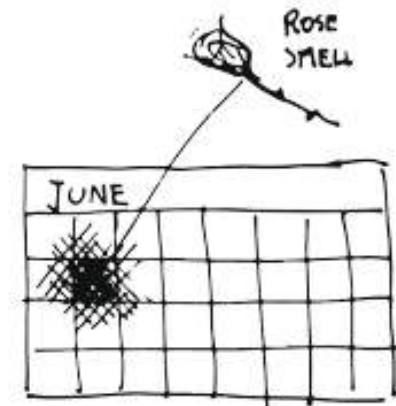INSTEAD COMMUNICATE TIMES WITH AUDIO OR SMELL. MORE QUALITATIVE AND GENERAL.

AUDIO

JUNE

JUNE

WHEN BOTH PEOPLE SELECT THE SAME TIME PLAYS MELODY

SMELL

Rose SMELL

GOOD TIMES FOR A DATE SMELL GOOD

JUNE

JUNE

Instant Mask of Annoyance

The Instant Mask of Annoyance is a tool that can be utilized by the user when they are experiencing annoyance with their partner. For example, if the user's partner is extremely frustrated, their face can blend in with the environment, this will be an indicator that the user is disinterested in the conversation or upset. Open communication allows relationships to thrive in polyamory and understanding and respecting one's discomforts is key to resolving any unresolved issues.

Polyamorous couples are very open about communication and recognize that sharing their feelings and emotions is the key to a successful relationship, it is necessary to create a tool that can aid in the development of "wearing your emotions" on your sleeves–or face for that matter. Our participant E first brainstormed this as Instant Botox Mask of Annoyance where one's face shows no emotion in the face when they are displeased rather than faking it. However, during the Body prototyping session, E developed a "Mask" that can blend one's face to the environment and space to show that they are not into their conversation. Our evaluator suggested that this should only be used as a last resort, when one is trying to break-up with their partners, otherwise, it might create more problems in the relationship.
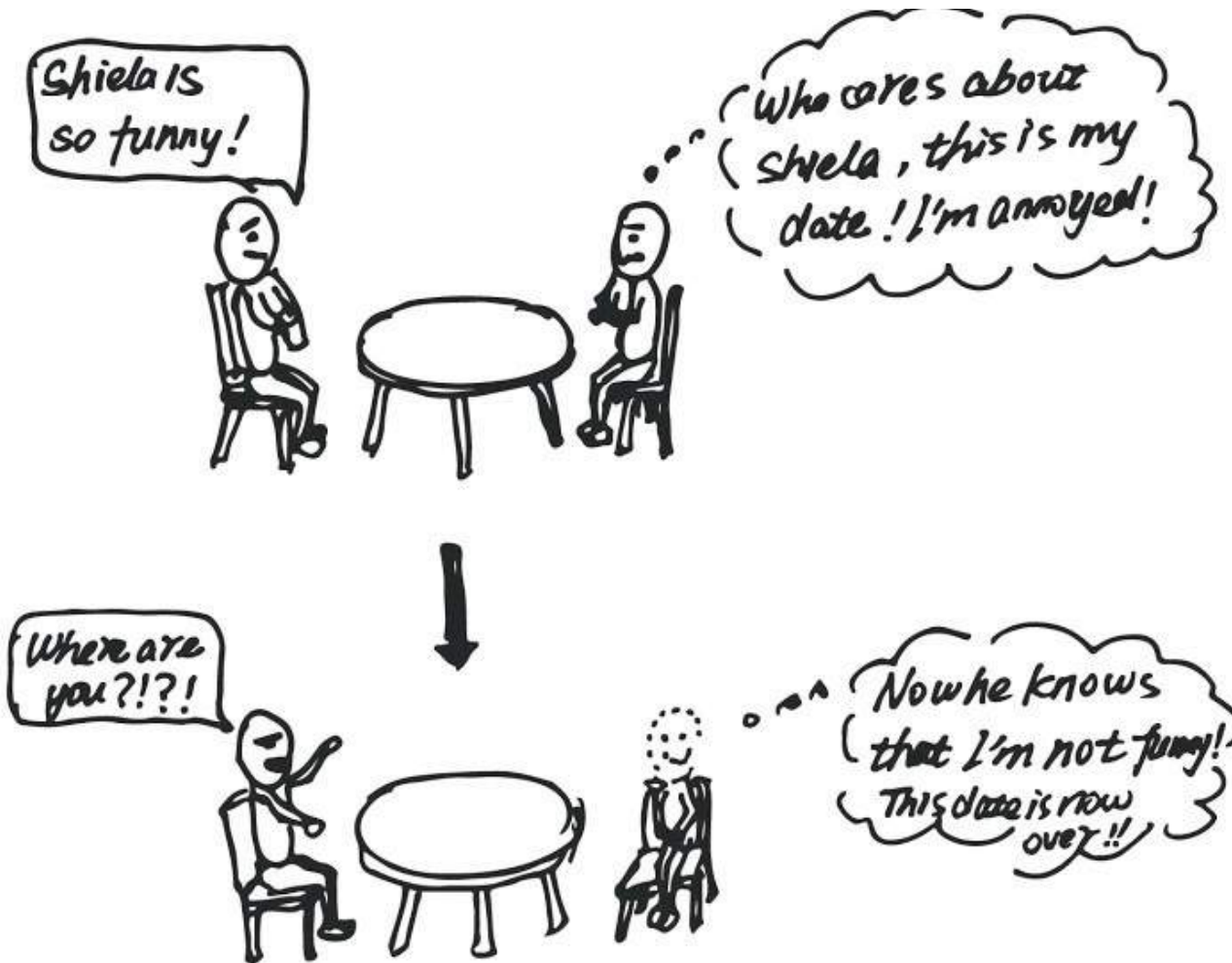
Privacy Forcefield (Two papers make a tunnel for communication)
A force field is created in the communication. Because in a polyamorous relationship, privacy is a big issue. During interview, one subject mentioned, "You feel happy that two smart guys love you at the same time, but you don't want they talk about you behind you." Privacy can only be transported in this forcefield. In this way, we don't have to be afraid of privacy leak.

EMOTION DISPLAYED
FOR OTHERS TO SEE
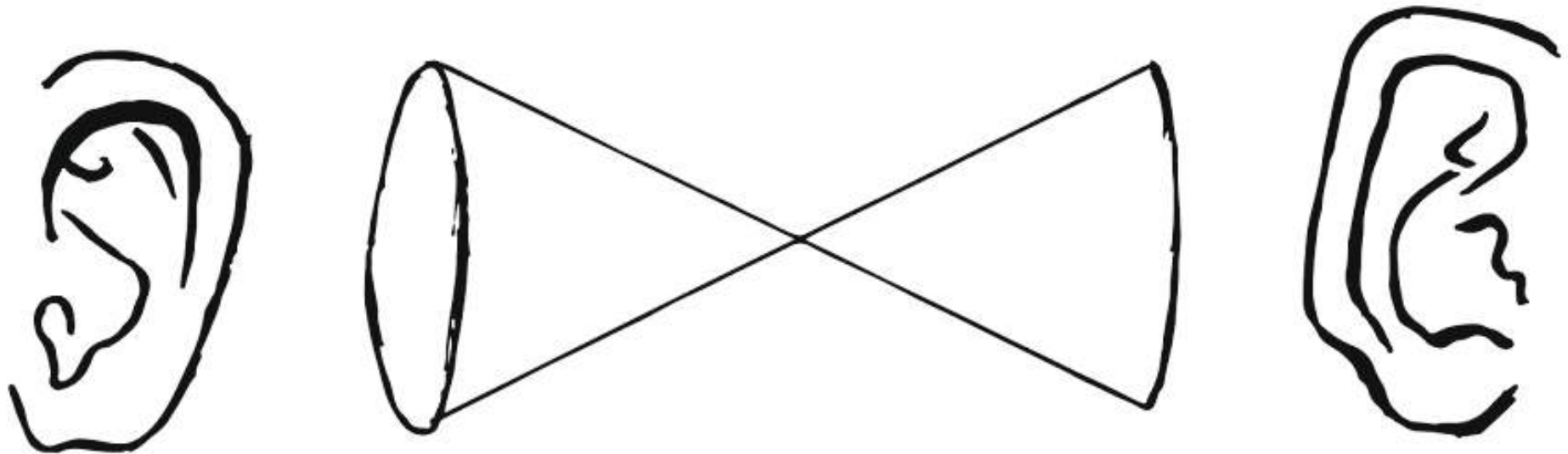
Emotional Landscape

It can be difficult to manage the emotional complexity of handling multiple romantic and sexual relationships simultaneously. That is what inspired this design direction. This design concept is a system to detect and communicate emotions between partners. It promotes a radical openness between multiple partners and enables them to have a sense of how all their partners are feeling at the same time. It won't communicate details but can provide a starting point for conversations and keep them more connected. If a partner feels insecure about their primary partners new secondary partner this emotion would be detected and shared. People that are hesitant to share their emotion because of shyness or potential embarrassment would now have their emotions shared, eroding the differences between emotional extraverts and introverts.

Basic tracking device, you can shut it off. (ex, tracking app to tell physical location)
Because the core of polyamory relationship is to be open, every member in a poly-relationship should know what is going on with the relationship. But total openness would could cause issues like jealousy. In the book that documented the journal of a poly-relationship, a girl admitted herself feeling jealousy when hearing the other two people in the relationship having sex. Only knowing the physical location of the other partners in the relationship can keep privacy in openness. Imagine that body can know the relationship map of the user and know the physical location of all the partners. When user wants to know the location of some partner, the body can tell the user whether the partner is busy and where they are.

physical location in the brain
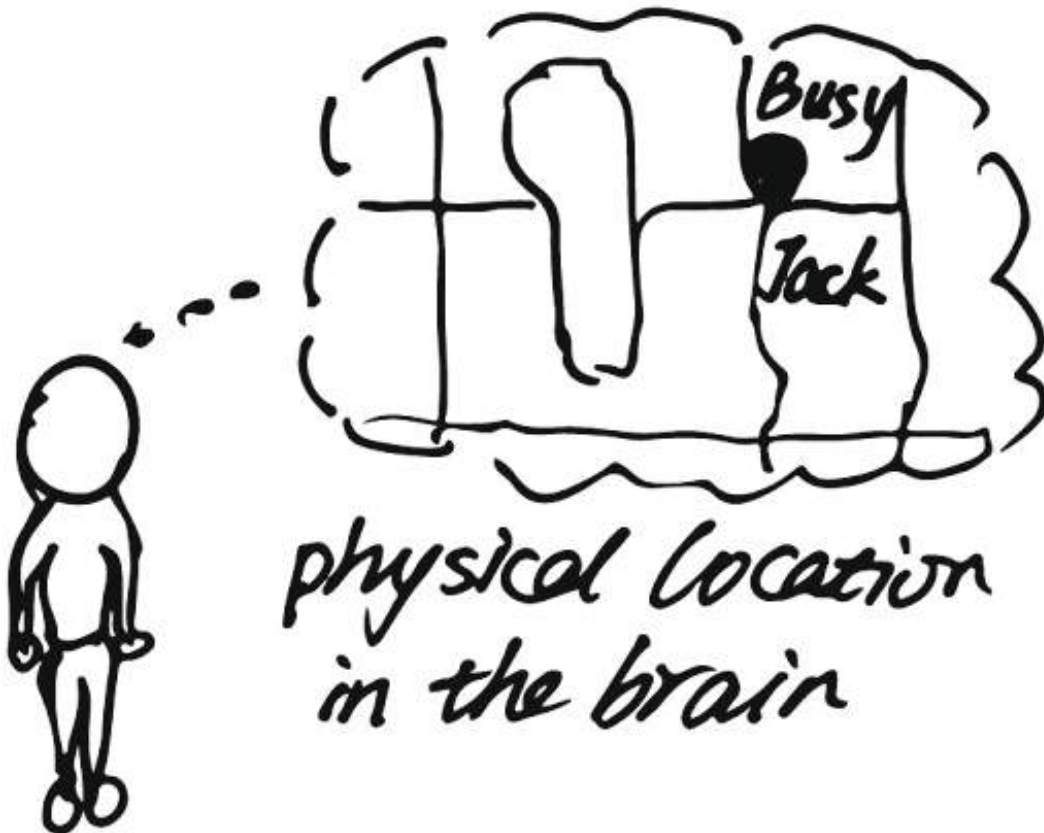
Invisible facemask

A special face mask is designed to prevent people from spilling the beans. When you are sharing something you should not share to other people, you can feel a mask on your month and it tells you not to do that. In this way, people who want to share a secret would be stopped, other people's privacy is protected. We got this concept from our subjects' warming up session.
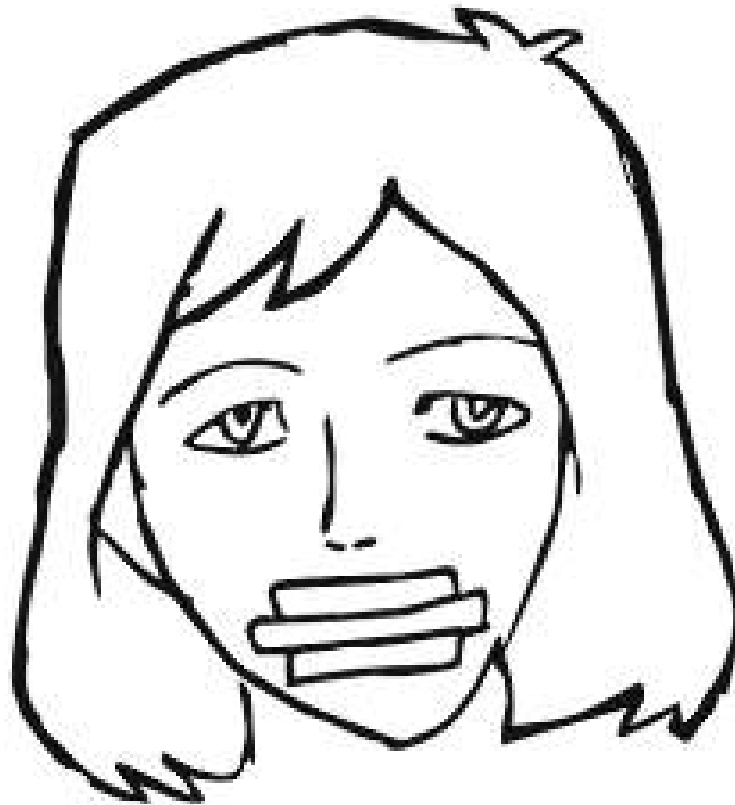
Instead of using texts to reply a text message, this concept helps to send also emotion status to the partner, which might be Emoji, image, reaction interpreted based on telepath/signal. This concept is actually suitable for two main situations. First is for situation when people can not reply to one's message. This situation will happen more often in a poly-relationship because people probably need to manage more than one relationship at the same time. In this circumstance, user can easily click "send emotion" to the partner, the telepath/signal will be interpreted into emotion and sent to the partner. Second is for situation when text itself can not express the emotion. In this circumstance, user can insert emotion in the text. Different from the existing emoji app, this concept can use the telepath/signal to judge the emotion and pick the right one.

If using future technology, when technology can be embedded in body, the device can become part of the body. Imagine you can create a special channel towards someone else's brain to communicate, like a channel we create to send text message to a specific person. When brain can be directly connect with another brain, text won't be the only thing we can communicate. We can also communicate emotion through this new way. Emotion will not need to be interpreted, instead it can be felt directly by another person.
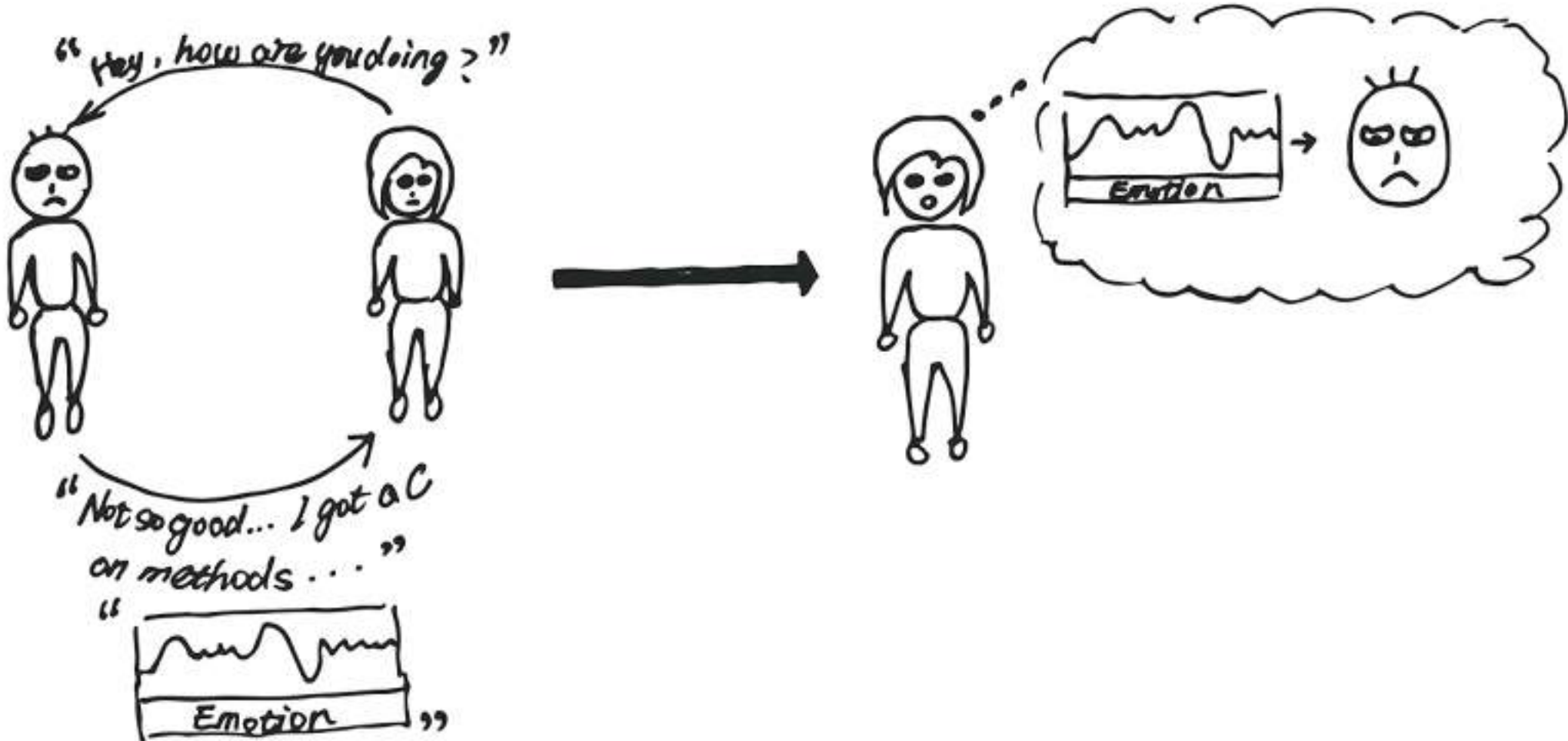
Itchy clothing to break up with someone

One of the concepts our participants developed was smart clothing to help someone to break up with their partner. Breaking up can be difficult and uncomfortable so people often try to avoid it. The smart clothing gets increasingly uncomfortable until the discomfort from the clothing is more than the discomfort of confronting their partner. As soon as they break up the clothing becomes comfortable again providing instant relief.
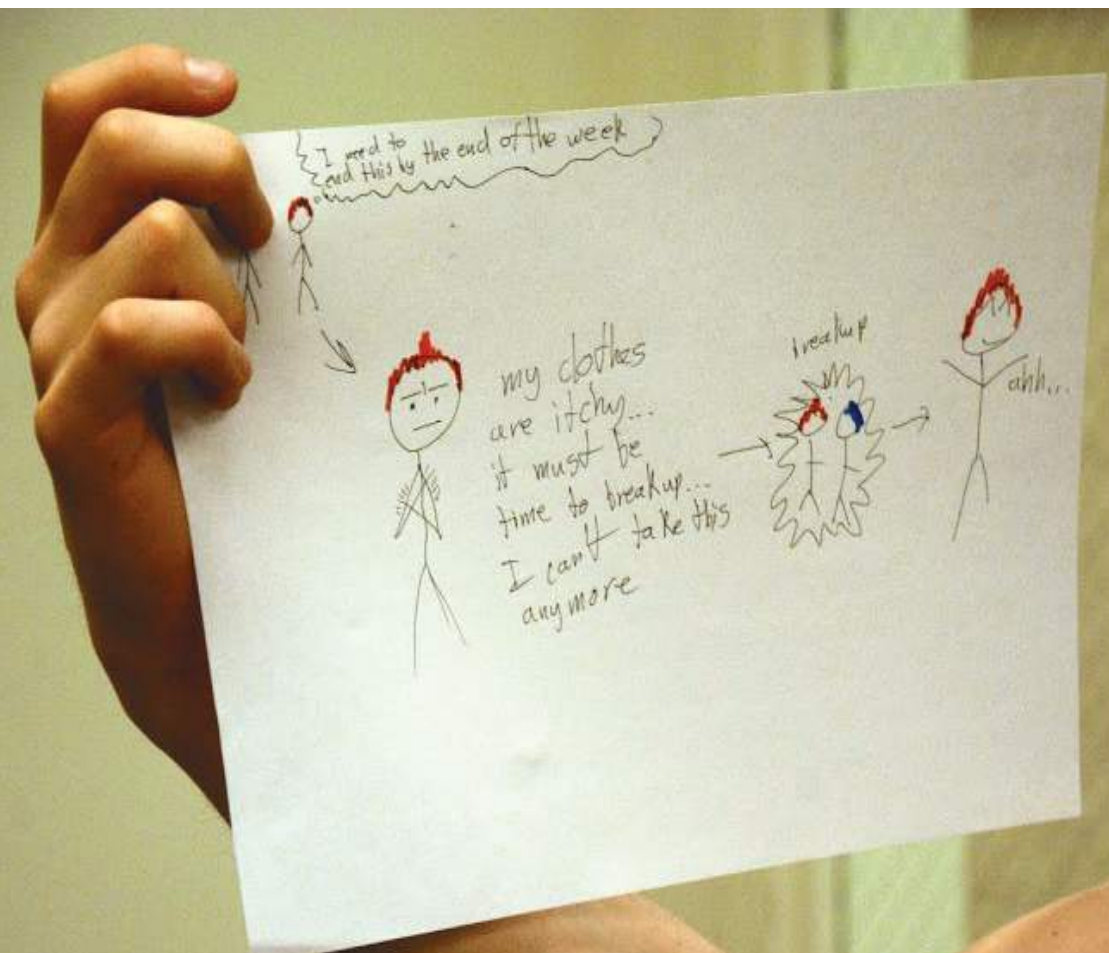
Privacy is very important in the polyamorous community. This is due to having many dominant relationships in one's intimate ecology. It is imperative to not share private secrets to your other partners, whether they are primary, secondary, or otherwise. This can cause a loss of trust and create issues with all of the people that are part of these relationships. Sometimes, accidents might happen where the person receiving the secret might perceive the secret as not a big deal to share.

Therefore, by transmitting secrets through a song that a couple might share with each other, they are able to maintain privacy without other partners knowing. If the user almost spills the beans to another person, the song will start playing alerting the user to stop sharing that information and serve as a reminder that they are about to violate the trust of the person that entrusted this information and that they need to reconsider their motivation and rationale of why they should share that secret.

This tool is a way to disseminate private conversations as well as create ownership of sharing that information with one's partner. Poly relationship dynamics include a lot of shared activities. Sometimes with metamors or secondary and tertiary partners. This can make privacy very difficult when spending time with several partners and certain boundaries can be crossed. Our participant's designed this tool because they share certain things with certain partners, and this enables them to create ownership over certain aspects of their lives and relationships. This tool also reflects the data that violating trust is a big no no in the poly community. By maintaining and respecting privacy of partners, but balancing open communication, positive relationships and decision making is improved for the betterment of personal communication.

Many quarrels in a relationship are resulted from misunderstanding and bad communication. Men and women usually have different mindsets and different ways of communication. To improve the efficiency of communication, we came up with the idea of a translator. This system can translate your style of communication into your partners' prefered communication style. In this way, the communication is more pleasant and efficient. We got this concept from our subjects during participatory design session.
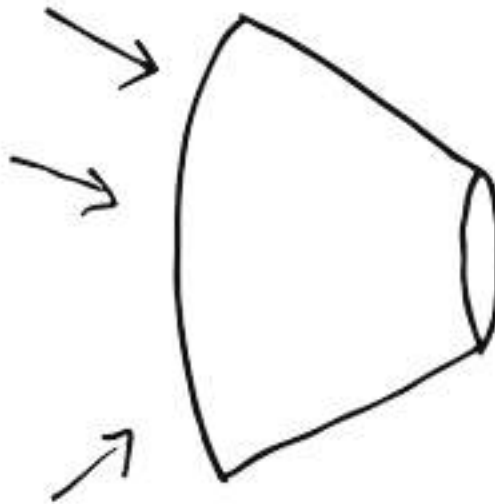
Vibe Translator

System that gives instant feedback on peoples reactions to communications. Details aren't articulated but emotional reaction is. Could be phone vibration. Uneven pulses to show they are insecure about their partner going on a date. Steady pulses to say they are fine. When technology can be embedded into body, the vibration can be on the body instead of on a phone. Imagine one talks to his partner that he wants to go on a date with a new partner, if the partner feels insecure about this, he will feel his body going through an uneven vibration.
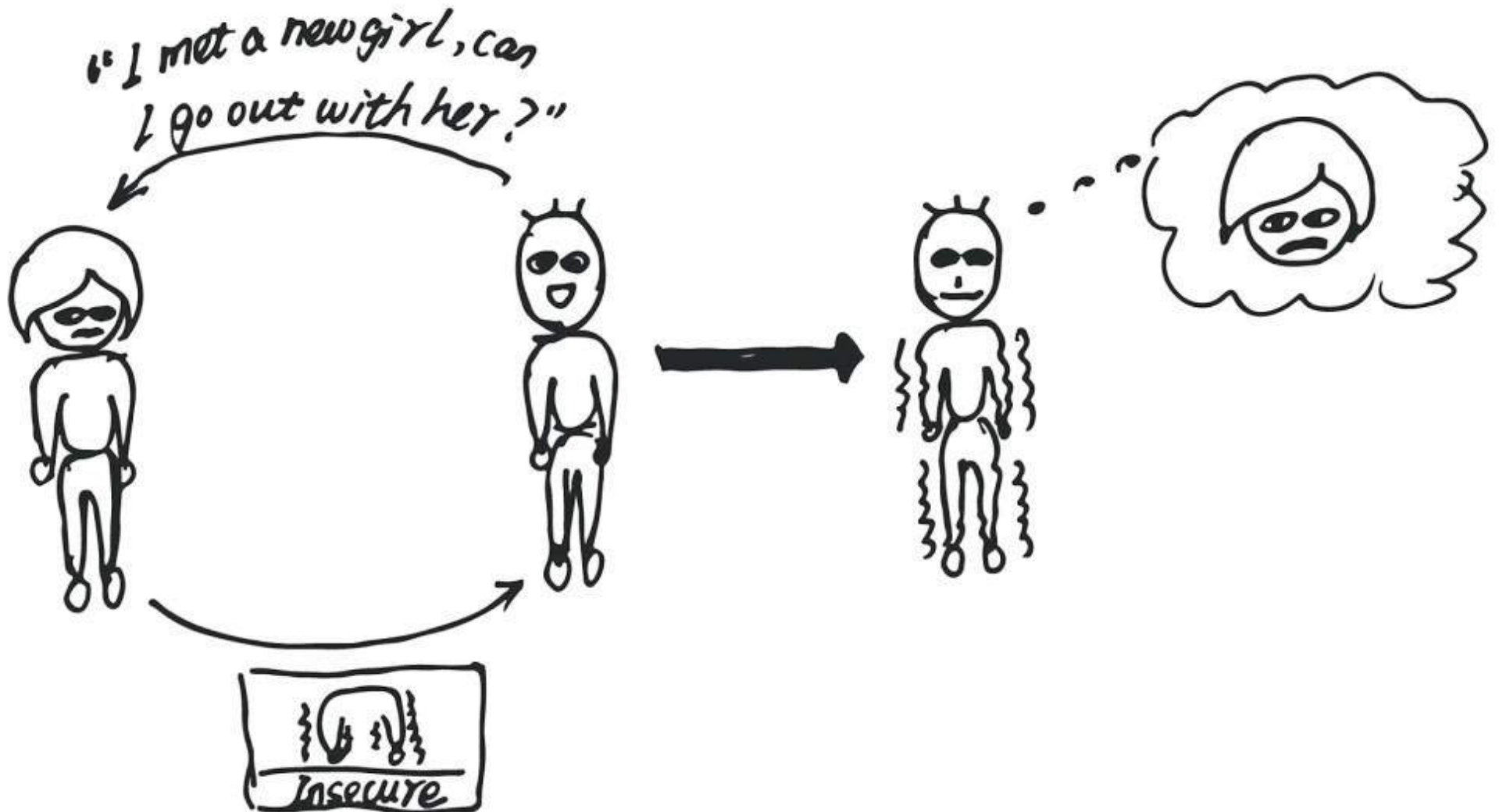
Appendix

>> **Polyamory:** "The practice, state or ability of having more than one sexual loving relationship at the same time, with the full knowledge and consent of all partners involved."

>> **Monogamy:** An exclusive relationship between two individuals.

>> **Monoamory:** "The practice or condition of having a single sexual partner during a period of time."

>> **Primary Partners:** Partners that have the highest level of commitment with each other.

>> **Secondary Partners:** Primary partner's other relationships that may have varying levels of commitment.

>> **Open Relationship:** A label that defines a primary partner's relationship which allows consent for either partner to have sexual and intimate relationships with other individuals. Often times, this is interchangeable with polyamory and is considered socially more acceptable. Our subject J and his girlfriend are in an open relationship. When she goes out of town, she has partners that she engages in sexually and intimately.

>> **Metamor**: This is a term for "someone your partner is seeing" Our first subject E's partner's girlfriend was E's metamor.

>> **Poly Triad:** A poly triad can consist of three individuals that share equal intimacy, or a metamor and two individuals that are primary partners.

>> **Polyfidelous:** "typically a triad that is exclusive to each other." For example, our subject M was exclusive with her two husbands.

POLYAMORY

Fieldwork plan to explore intimacy in the modern age.

Action Plan Timeline

Please note that this is for documentation reference only.
March 25th, Initial Meeting 1pm-2:30-> problem space exploration
During our meeting we discussed potential topics that we were interested in for our project. Some of the topics discussed were about senior citizens, polyamory, relationship break up through technology. We went over a criteria with time and accessibility and other qualities that we wanted for this project to review some of the topics.

March 27th, First Meeting 6:30-8:30 -> research (recruitment+methodology)
We met today and decided we really wanted to study Polyamory. Through this, we used facebook to ask for people. We will be doing surveys, interviews, and maybe diary study to understand the problem space. (Experience map?) We also flushed out what kinds of things we wanted to learn about this subject.

April 1st, Kinsey institute 3:30-   -> literature about polyamory community
We went to the library in Kinsey Institute and looked at two books: one is about teaching you how to be a polyamory… another one is the journal of a triadic relationship. We also got the contact information of professor Justin Garcia.

April 3rd, Prianka's house-->Interview with First Subject
Describe Subject: Late 20s to Early 30s Caucasian Female. Extremely intelligent and highly articulate college graduate.

Interview: She described why she wanted to explore polyamory. It first began as an understanding of many loves through her parent's divorce. Because they remarried, she began to formulate as a child an understanding that one can have multiple relationships and that allowed her to explore an open relationship with her partner. While at most times they have been monogomous, they began exploring other relationships and thus came the metamor. A Metamor is a person that only one person in the primary relationship is dating. The Metamor has a friendship bond with the other person that is not her lover in the relationship. (Show a visualization of this).

April 8th, Room 150 -> Planning for next steps
We had a mini meeting after Methods class, talking about our plan for next steps. Melissa, Clark and Jiaqi will have the interview with Professor Justin Garcia at 9:30am Wednesday morning. All of us will have the interview with J at 4pm Wednesday. Then we need to prepare for affinity diagram. We divided our work and the division is as below:
Subject 1's Interview

1st part: Clark
2nd part: Prianka
3rd part: Melissa
4th part: Jiaqi
Subject 1's Note: Melissa + Prianka
Subject 2 Interview: Prianka + Clark
Subject 3's Interview: Clark + Prianka
Professor's Interview: Jiaqi + Melissa

April 9th, Fishbowl, On Campus, Interview with Second Subject Describe Subject: Caucasian Male in early 20s. Currently enrolled in graduate program at IU. Thoughtful, Interviewed subject

April 9th, Graduate Design Studio, Affinity Diagram
We so far sorted the data that we have received from a Subject and the Researcher. We are realizing that we aren't seeing problem spaces as much. Still trying to understand how to define a polyamorous model to compare with monogamous model.

Next meeting: 6pm Thursday at studio.
(Interview time with M: FA 019, 3:30pm)

April 9th,

PD Session
5'   Intro
15' Warm-up scenario
5'   Explain (E.g. Story "You are in the new world where monogamy is no longer the dominant relationship"; Images; Show some clips of Walle; Doctor Who)
5'   Construct-------- 3 of this
5'   Act it out -------- 3 of this
Body Prototyping (Rules: Skeleton/puppet; crafts; art figures/poseable; Examples)

What we are doing:
Scenarios (Time)
Purpose
Emotion

Constraints:
No magic
Useful for people

Hopefully this comes through privacy...

Have put out a couple more feelers for ya. Also, here's two blogs I've done some reading on and find interesting, sometimes insightful. http://polytripod.blogspot.com/ & http://www.theferrett.com/ferrettworks

Finally, my head kept spinning out ideas after our interview. The one that I'll throw out for now kind of takes off from the comparison betwee relgiously-based multi-partner marriage in the specific form of Fundamentalist Mormon polygamy and non-religious polyamory that is more culturally aligned with New Age, queer, and hipster cultures.

The big thing, the big positive or value and the central driving experience, of being "open" to me is a specific process of self-dialogue, self-articulation, and dialogue with the Other. Openness starts from a rejection of a dominant model of understanding sex, emotions, and relationships as necessary or sufficient, and intiates a process of attempting to construct the alternative, a process which is ongoing. So, the way I see it, one thing a mental model of relationships does is provide a cognitive management system for emotions and expectations. In any type of relationship you go through experiences of discomfort, jealousy, confusion, dissatisfaction, satisfaction, excitement, closeness, alienation, etc. The monogamy model doesn't perfectly predict emotions for each person, but it does tell you a lot about how to prioritize, justify, express, or negotiate the emotions you do have. Most obviously, for example, it tells you that when you are sexually disatisfied with your partner, the appropriate course of action is to make an effort with them to "spice it up" and find new means of satisfaction, while if you are disatisfied with how they interact with others, the appropriate course of action is to re-capture their attention and enforce your claim to it, if you feel tempestuous over a specifically sexual interaction, the appropriate course of action is to deem them unworthy of you -- to break up in a specific way that assigns blame. Jealousy is an emergency that triggers emergency protocols and an emotion that takes a certain kind of precedence over other emotions; other emotions have less overriding power. Of course, monogamy operates at several levels, with a whole shadow framework of conventions that defines, predicts, regulates "cheating". Similarly, Mormon fundamentalism provides clear guidelines about what the social outcome should look like, so it provides practitioners with a framework into which to negotiate and fit their emotions -- here, jealousy is not a state of emergency, but a type of dissatisfaction to be negotiated, etc., but some desires -- for undeclared partners, for example, is censurable, etc. And no doubt there is a shadow level of cheating conventions in this system too. To this extent, any traditional form polyamory is analogous to

monogamy as a shared cognitive/cultural framework that people struggle to use to understand and negotiate their indivual experiences; in these cases you can locate a normative conceptual map that individuals in the community will tend to refer to in common as they navigate their individual experiences. ON THE OTHER HAND, "modern poly" or whatever is intensively individualistic and a-traditional, taking as the starting point not a specific social outcome which conditions and provides the evaluative framework for individual experience, but individual experience itself. So, in designing for this community, something to keep in mind, perhaps, is that it is a community of people who are generally trying to position and articulate themselves *through* praxis, lacking or having abandoned the kind of fixed coordinates that communities based on shared points of reference (a book, a preacher, a political philosophy, naturalized mores) use to help to map emotional life. The constant need is for ways of doing that mapping, ways of feeling through, thinking through, articulating, communicating, and engaging in negotiation in a world in which moral power relationships are unfixed, leaving personal perception and feeling as the paramount Real. As an initially deconstructive experience that places an individual within a social group that lacks normative points of reference, openness or poly can involve an ongoing redevelopment of the personal, an interrogation of what perceptions and feelings really are, a lot of writing of new moralities (social, behaviorial, communicative codes) and identities (self-relations and articulations).

My experience has been 90% open-mindedness and very little actual sex. Of course, I'm way on the introspective side of the spectrum, and not everyone is! But I think that the sense of an imperative to communicate and negotiate better among partners is fairly widely characteristic of modern poly, and it implies a need to be doing that same work at the level of the self as well. Many poly bloggers locate morality in process rather than outcome, emphasizing that communication and negotiation is a guiding commitment/virtue. While negotiation is a key activity at the core of monogamous marriage, etc., two things that make open/poly relationships somewhat distinctive are (a) the inextricability of internal and external negotiation, and (b) the focus on virtues or integrity of process over outcome.

Summary: These people need ways and processes of "figuring it out" where "it" can mean your own experiences, someone else's, or the negotiated middle ground. ...more than tools that facilitate particular outcomes. Tensions in transparency/privacy, and protocols about who should have access to what communications are major sticking points.

Outline of session: 90 minutes total

Intro
5 minute:
Description:

(Brief introduction about our team and ice break)

Goals of the session:
We want to understand future non verbal communication through your mind, body, and technology.

Modern polyamory is just now being researched and is still a very experimental topic in human computer interaction. This is a difficult and interesting design space because there isn't much existing research to guide our design process and privacy issues make recruitment more difficult. This may cause difficulty for designers as well as participants in the polyamorous community. We aim to develop a new prototyping method that incorporates the participant to become the prototype. We chose participatory design here to help us get more insights. A new prototyping method is used here to empower participants to design for themselves. Body prototyping helps them to be more engaged in the design scenarios.

(Video Intel Make it wearable 0-1:30)

Warm up Scenario (10 min)
Provide scenario where they have to use their bodies to communicate (break-up). Desert island where they can't talk and have no electronic devices.

Have them walk through short 5 minute scenarios focused on different senses to introduce them to the concept of body prototyping.

While it's communication through non-verbal means, you will be practicing the "Think Aloud" method. You will be thinking aloud what your device is doing to communicate the prompt.

Explanation of Body Prototyping
Using the body as part of the prototyping material.

Scenario: You and your partner are living in the year 2114. Monogamy is no longer the dominant relationship status. Polyamory is dominant and communication is key. Technology has changed so much in the past 100 years. Nanotechnology has allowed people to have technology embedded in their bodies. Magnets, lights and electronic devices are now the size of cells. Anything is possible and it is up to you to determine how people can communicate with each other nonverbally.

You have 5 minutes to sketch out a non verbal communication device for the body. You may work independently.

You have 10 minutes to develop your device on your body. Please use the items in the prototype box, and tape them on your body.

You now have 5 minutes to communicate through your device to your partner, they will also communicate back through their device.

Sharing Time:
(a.) When you are with your partner, he/she is texting with secondary partner, while it is your time. How would you communicate with him/her that this is inappropriate?
(b.) Your secondary partner wants to go on a date with you next Tuesday. But, you are already going on a date with someone new at that time. How would you communicate to your secondary that you are booked?

Privacy:
(a.) You have to communicate with your partner that you don't want them to share your secret to their other partners.
(b.) You have to communicate with your secondary partner the secret.

Jealousy:
(a.) You are jealous of your partner's new date, how do you communicate that you are insecure about this situation?
(b.) Your partner's secondary partner makes you feel very uncomfortable and uneasy. How can you communicate with your primary partner about this issue?

Conclusion/Discussion/Evaluating
1. What are you favorite devices?
2. Do you think these are effective communication devices for your group?
3. Do you think this would work for monogamous couples as well?
4. Can you think of how the futurist concepts you developed could be realized with today's technology.

Body Prototyping Session

Rules:
Scenarios (Time, Role)
Purpose
Emotions

Constraints:
No magic
Useful for people

Prompt/Interference:
http://thecreatorsproject.vice.com/blog/video-premiere-make-it-wearable-part-1
Human Communication
https://www.youtube.com/watch?v=QRt8QCx3BCo
 (Braingate)
https://www.youtube.com/watch?v=gnwklLxhFA0
(Monkey's brain control)
https://www.youtube.com/watch?v=7kctOHnrvuM
(Monkey mind control)

Schedule

Introduction (5min)
Goals of project
Background
Video
Permission - non-identifiable video

Warm-up (15min)
Future scenario
3 senses
More and more people use technology for dating. Last year for the first time in human history more couples met online than in person. People are also breaking up using technology. Through text message facebook. Imagine ways that people could break up using each of the different senses. Touch, taste, smell, sound, sight, temperature.

(coffee tastes bitter, emoticon, slap, notes, temperature very low, stop paying bill, mail the dead cat...)
1. temperature - feeling
2. smell/ taste
3. light/ seeing
(two min each acting out)
Please choose your favourite idea.