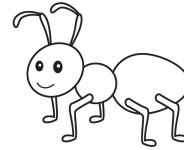


Carpenter Ants



— Accessible Design for Different Abilities —

Focused on Learning Disabilities

Our Team



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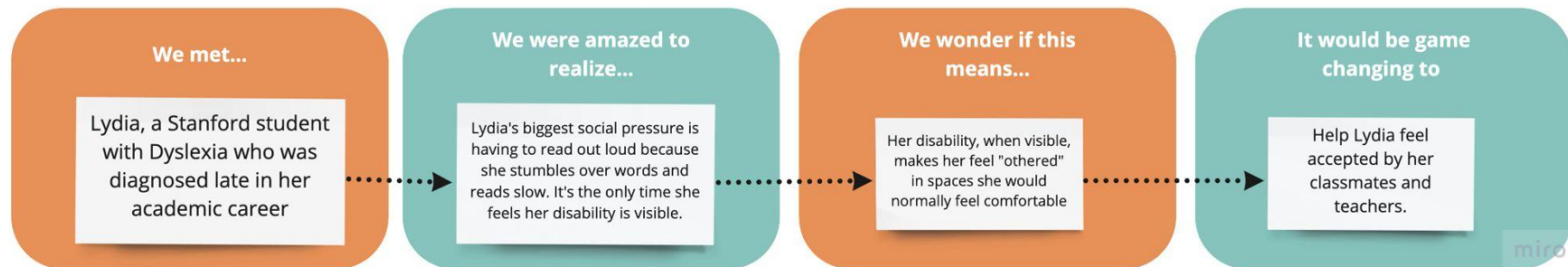


Ryan A.

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Science - HCI

.....
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FL

Initial POV



Interviewees



Sylvia

23 years old

Medical Student

Spinal Cord Injury -
Paralysis



Warren

25 year old

Early Professional

Obsessive Compulsive
Disorder



Warren

25 years old

Early Professional

Obsessive Compulsive
Disorder

SAY

"Up to me if I would be helped or not"

"No matter how much I talked to [my therapist] about it, it was ultimately up to me"

"It started to take effect Freshman year of high school."

"I never thought I needed the extra time on exams."

"The main issue was that thoughts would flow into my head and never leave."

"I used to think that if I held my breath for 20/30 seconds then this or that will happen."

"During a math final junior year of high school, I had an episode where I felt like someone was screaming into my ear during the whole test."

"[Warren's therapist] taught me a visualization technique where I pretend I'm looking out a train window and watching my thoughts come and go in the landscape."

"[OCD] will always be there if you don't have a plan to overcome it."

THINK

OCD is very much an internal struggle for Warren

Coping mechanisms are personal (what works for one person might not work for the next)

Warren is proud of how he's been able to combat his OCD.

He thought accepting help from his high school would've heightened the influence that OCD had on his life

Warren's OCD episodes are often unpredictable (for him).

He believes that a structured plan is critical to dealing with OCD

OCD might have a larger influence on Warren's life than he thinks

DO

Picked at arms, hairs, etc. at school when thoughts would loiter

Saw a therapist starting freshman year of high school

Never told the school that he had OCD

Was normally able to control his OCD episodes when amongst his friends

Performed rituals, like holding breath or finishing a task in x amount of seconds

Wore a rubber band on his wrist and would snap his arm with it whenever he felt the urge to pick at his arm)

Practiced meditation to cope

FEEL

Proud to overcome OCD

Scared of not being able to get better

The process of coping felt very personal/individualized

Open to trying different coping mechanisms out

Didn't think that his OCD was "bad enough" to effect his academics

Confident in his ability to efficiently cope



Warren

25 years old

Early Professional

Obsessive Compulsive
Disorder

SAY

"Up to me if I would be helped or not"

"No matter how much I talked to [my therapist] about it, it was ultimately up to me"

"It started to take effect Freshman year of high school."

"I never thought I needed the extra time on exams."

"The main issue was that thoughts would flow into my head and never leave."

"I used to think that if I held my breath for 20/30 seconds then this or that will happen."

"During a math class, I was asked to help someone who didn't know how to do it. I was the only one who knew how to do it."

"I never thought about it. I was just a person who was good at math."

"[OCD] will always be there if you don't have a plan to deal with it."

DO

Picked at

would later

be diagnosed

with OCD

Was normally able to control his OCD episodes when amongst his friends

Practiced meditation to cope

Obsessive Compulsive Disorder of high school

Performed rituals, like holding breath or holding a task in x amount of seconds

Obsessive Compulsive Disorder of high school

Wore a rubber band and would snap his arm with it whenever he felt the urge to pick at his arm)

THINK

OCD is very much an internal struggle for Warren

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Warren is proud of how he's been able to combat his OCD.

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OCD might have a larger influence on Warren's life than he thinks

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Proud to overcome OCD

Scared of not being able to get better

The process of coping felt very personal/individualized

Open to trying different coping mechanisms out

Didn't think that his OCD was "bad enough" to affect his academics

Confident in his ability to efficiently cope

- The process of coping with OCD was an internal struggle for Warren, requiring the frequent use of a visualization technique to calm down.

- The effectiveness of certain techniques varies from person to person, working for some and not for others



Sylvia

23 years old

Medical Student

Spinal Cord Injury -
Paralysis

SAY

"Our kids, especially as they get older, they don't have a lot of options for getting together with friends"

A lot of people abuse the system which pissed me off

Really hard to explain my situation to my professors

Its really awkward sometimes asking for help

Sometimes its too hard to explain my situation so it's just not worth it

I feel guilty making others have to help me all the time

Ill ask people on the street for help sometimes

Sometimes ill push things with my back on the ground, pushing like an ox

THINK

Traveling is scary

She needs to live with many roomates

Her friends will help her when she asks

Its dangerous to ask strangers for help

She can solve problems on her own even if they are extremely tough for her

uncertain about becoming a disabled doctor

DO

Ask stranger to help carry bag upstairs

Try to explain her condition to random people who assume she is able

Have to stand up every 30 min when sitting

Have to ask friends for help

Calls agency to help carry bag on/off train

Travels with a backpack

Lives with friends so she can get help

FEEL

Like asking her friends all the time is annoying for them

Guilty for not letting her friends do thing when they travel together

Like a burden on others

Helpless when she has to travel

Not heard by her schools professors

uncertain about becoming a disabled doctor

uneasy about living alone



Sylvia

23 years old

Medical Student

Spinal Cord Injury -
Paralysis

SAY

"Our kids, especially as they get older, they don't have a lot of options for getting together with friends"

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Really hard to explain my situation to my professors

Its really awkward sometimes asking for help

Sometimes its too hard to explain my situation so it's hard to ask for help

I feel guilty making others have to help

I'll ask people on the street for help

Sometimes I'll push things with my back on the ground, pushing

THINK

Traveling is scary

She needs to live with many roomates

Her friends will help her when she asks

Its dangerous to ask strangers for help

She can solve problems on her own even if they are extremely tough for her

uncertain about becoming a disabled doctor

- Asking friends for help is hard for Sylvia because if her roomates are not home she has to text people directly in her area to come help her.

DO

Ask stranger to help carry bag upstairs

try to explain her condition to random people who assume she is able

Have to stand up every 30 min when sitting

Have to ask friends for help

Calls agency to help carry bag on/off train

Travels with a backpack

Lives with friends so she can get help

- Reaching out to people directly for help, **even if it's over the phone**, evokes a sense of guilt.

FEEL

Like asking her friends all the time is annoying for them

Guilt for not letting her friends do thing when they travel together

Like a burden on others

Helpless when she has to travel

Not heard by her schools professors

uncertain about becoming a disabled doctor

uneasy about living alone

POV 1

We met...

Mercy, a stay-at-home mom of a daughter with Sotos Syndrome who teaches all-inclusive fitness classes

We were amazed to realize...

Mercy wouldn't let Sammy go to foothill college until COVID caused online learning because then she could watch over her while she was on Zoom.

We wonder if this means...

She gets anxious about letting Sammy go out on her own and wonders if she'll be able to conform to the social and educational standards

It would be game changing to

Give Mercy peace of mind that her daughter is getting adequate support in class

We met...

Mercy, a stay-at-home mom of a daughter with Sotos Syndrome who teaches all-inclusive fitness classes

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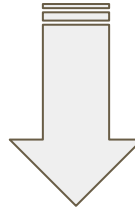
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Give Mercy peace of mind that her daughter is getting adequate support in class



How might we provide Mercy with information about her daughter's actions and whereabouts?

POV 2

We met...

Rachel, a professor in her earlier 30s who became blind at age 25

We were amazed to realize...

She felt afraid to be out in public alone with her white cane

We wonder if this means...

She feels vulnerable outwardly expressing her visual impairment to strangers

It would be game changing to

Provide Rachel with a sense of security when out in public

We met...

Rachel, a professor in her earlier 30s who became blind at age 25

We were amazed to realize...

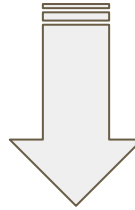
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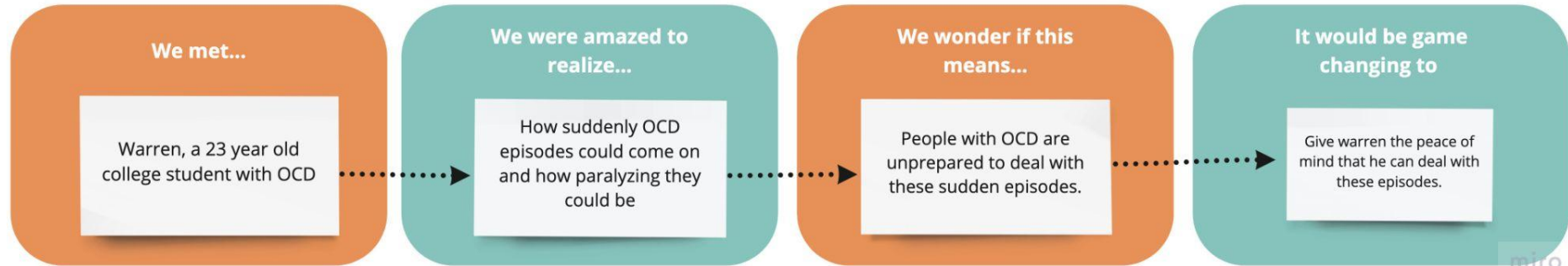
It would be game changing to

Provide Rachel with a sense of security when out in public



How might we match disabled individuals to others who are willing to help?

POV 3



We met...

Warren, a 23 year old college student with OCD

We were amazed to realize...

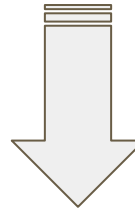
How suddenly OCD episodes could come on and how paralyzing they could be

We wonder if this means...

People with OCD are unprepared to deal with these sudden episodes.

It would be game changing to

Give warren the peace of mind that he can deal with these episodes.



How might we make coping mechanisms more accessible?

Solution 1 – *How might we match disabled individuals to others who are willing to help?*

- Connect those with disabilities to network of friends that could potentially help them in their area with **digital help-request platform**.
- User can send out help request to friends, people in area get notification and one friend can opt-in to help - Only friends can see how often they have helped/not helped and **user does not have to ask for help face to face**.

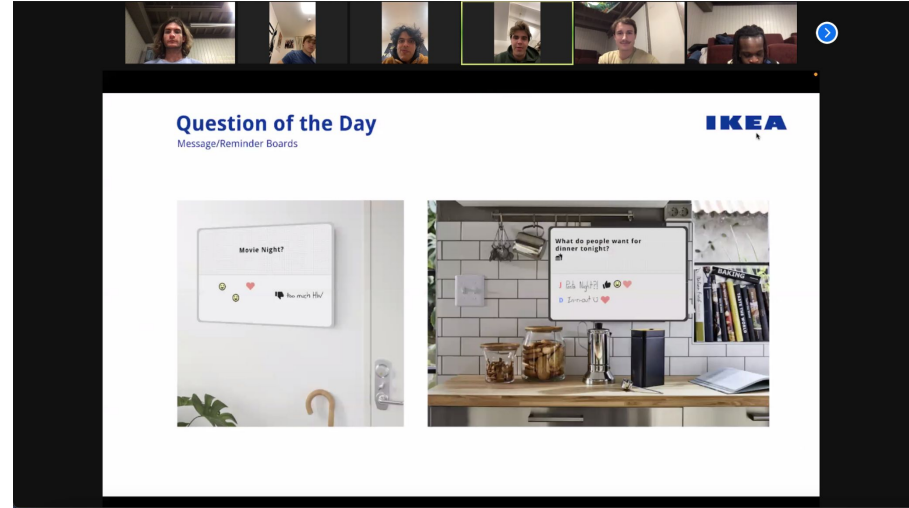
Prototype

Assumption: People feel more comfortable asking for help if the process removed personalized contact and was to a group of respondents.

Prop: Zoom presentation to group

Actors: Stanford students (5-6 per presentation)

How it worked: One presentation where participants were asked to ask questions to just the presenter- second presentation where they knew there were three of us answering questions.



Results

Things that worked:

- More people asked questions when they knew there were more people to answer questions
- Lots of questions were asked throughout the presentation

Things that didn't work:

- Was hard to get same turnout and give identical presentation - so maybe way it was presented was a factor as well as who was there

Surprises:

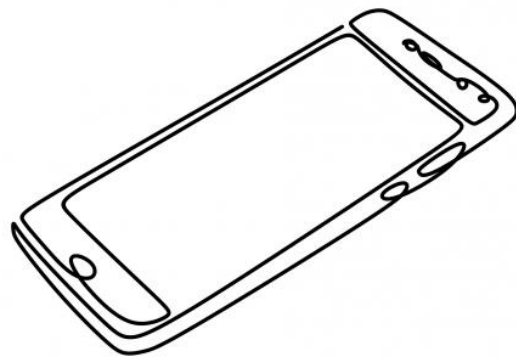
- The questions posed to the group were, on average, more thought out than those posed to the individual

People feel more comfortable asking for help if the process **removes personalized contact** and is to a **group** of respondents.

VALID

Solution 2 – *How might we make coping mechanisms more accessible?*

- Create a **repository of all OCD coping mechanisms** that people who are suffering from episodes can access on their phone.
- Offer individuals the ability to gain access to mechanisms and **learn how to cope** with their episodes.
- Also offer **guided walkthrough** of the selected coping mechanisms.

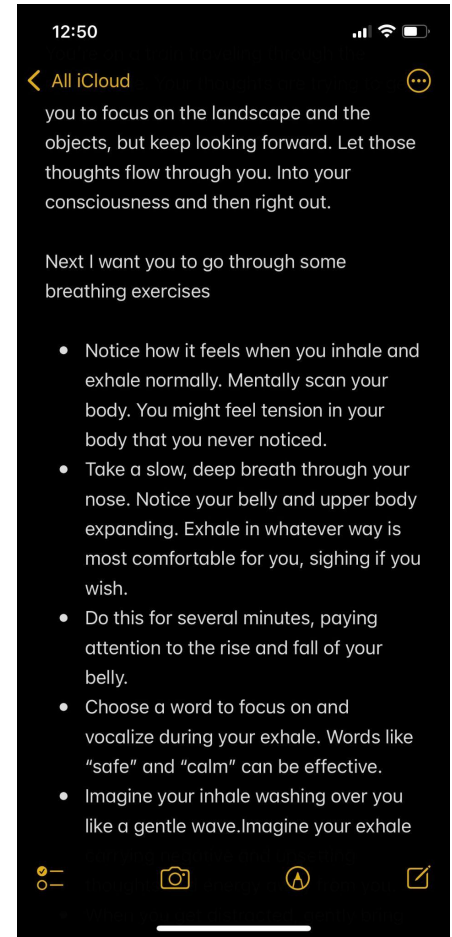


Prototype

Assumption: *A phone is an effective medium for leading someone experiencing an OCD episode through various coping mechanisms.*

Prototype Description: *Provide descriptions of multiple coping mechanisms to someone who suffers from OCD and have them go through one/some of them during their next episode.*

How we tested: *We texted David, a student with OCD, descriptions of two different coping mechanisms (a visualization activity and a breathing exercise) and told him to read through them the next time that he had an episode. We followed up with David 3 days later and asked him how often he used the exercises and how effective they were for him.*



Results

Things that worked:

- Mechanisms were easily accessible
- Anxiety from episode was lowered: "I immediately felt like I had a plan and was confident in fighting back"

Things that didn't work:

- Visualization tasks were not as easy (some of the mechanisms that required coming up with thoughts in head)

Surprises:

- Breathing exercises were very successful

A phone is an effective medium for leading someone experiencing an OCD episode through various coping mechanisms.

VALID

BUT...

Some coping methods were not as easy when being read as formative tasks (visualization tasks)

Solution 3 – *How might we make coping mechanisms more accessible?*

- Allow those with mood affecting disorders to quickly track daily emotions.
- On days where users might encounter a trigger, Provide functionality to **document coping mechanisms** to deal with these triggers, and **optionally journal reactions and responses** to these coping mechanisms.

Prototype



Assumption: People are comfortable and willing to confront their triggers head on in order to reflect and grow

Prop: Google form “Journal”

Actor: College student diagnosed with depression

Role: Fill out the form for two consecutive days

Daily Journal & Reflection

 kradz@stanford.edu (not shared) [Switch account](#) 

Rate your mood today:

1

2

3

4

5

Not doing so great

☒

☐

☐

☐

☐

Amazing

What contributed to your mood today?

Your answer

Did you experience a trigger today?

☐ Yes

☐ No

☐ Other:

If yes, describe your experience:

Your answer

Results

Trigger: Unexpected car crash in a movie caused a panic attack

Past Occurrences: 10-15

Things that worked:

- Improved their mood
- Generally positive and helped them move past it

Things that didn't work:

- "Sometimes it made me feel worse"
- Hard to revisit

Surprises:

- Helpfulness depended on the day/severity of the trigger

People are comfortable and willing to confront their triggers head on in order to reflect and grow

VALID

BUT...

A daily mood journal would be more productive than one that could be used as the user

We learned...

- Confronting emotional triggers can be beneficial, but there may be a limit as to **how frequent** one is comfortable with the action
- OCD episodes can effectively be dealt with through self-lead walk throughs of coping mechanisms, but formatting these personalized list has an effect on the user's experience.
- People are **more comfortable** asking questions to a group vs an individual, and questions posed to groups are typically **more elaborate** than those posed to individuals.

What's next...

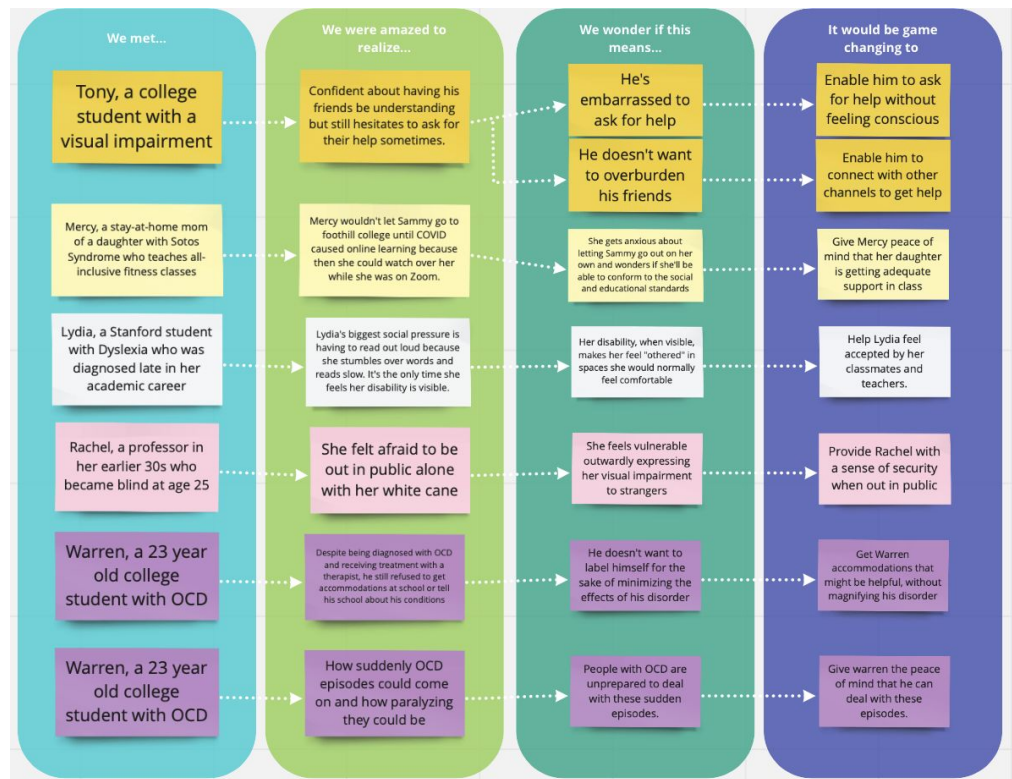
Solution 1: Connect those with disabilities to network of friends that could potentially help them in their area with a **digital help-request platform**.

The needs this solution addresses were recognized in the most diverse range of individuals with both physical and mental disabilities

Next we hope to test some more of this solution's assumptions with new prototypes.

Thank you!
Any Questions?

Appendix: POVs



Appendix: HMWs for each POV

We met...

Lydia, a Stanford student with Dyslexia who was diagnosed late in her academic career

We were amazed to realize...

Lydia's biggest social pressure is having to read out loud because she stumbles over words and reads slow. It's the only time she feels her disability is visible.

We wonder if this means...

Her disability, when visible, makes her feel "othered" in spaces she would normally feel comfortable

It would be game changing to

Help Lydia feel accepted by her classmates and teachers.

How Might we ...

HMW decrease Lydia's social anxiety

How might we remove teacher incentives for reading out loud in class?

HMW decrease the expected reading quality in class

HMW make the reading experience easier for Lydia

HMW remove the need for anyone to read aloud in class

HMW incentivize students to share their learning difficulties?

Replace reading out loud in class with something more inclusive for everyone

How might we allow Lydia to read out loud in class privately?

How might we make Lydia comfortable getting reading help from classmates?

HMW highlight Lydia's non-literary skills in the classroom

HMW encourage teachers to set social standards at the beginning of the year?

HMW better prepare Lydia for when she needs to read out loud?

HMW connect Lydia with people who have similar experiences?

HMW provide a means of communication to share her fears with her instructors?

HMW decrease the importance of reading well in class

Appendix: HMWs for each POV

We met...

Warren, a 23 year old college student with OCD

We were amazed to realize...

How suddenly OCD episodes could come on and how paralyzing they could be

We wonder if this means...

People with OCD are unprepared to deal with these sudden episodes.

It would be game changing to

Give warren the peace of mind that he can deal with these episodes.

How Might we ...

How might we enable Warren's peers to help resolve his compulsions

How might we make coping mechanisms more accessible

How might we personalize coping mechanisms

How might we teach people about coping mechanisms

HMW enable warren to predict when attacks will occur

HMW lessen the severity of the episodes

How might we constrain his coping mechanisms to more feasible actions

How might we ease Warren's anxiety when his episodes do occur

How might we prevent warrens episodes from occurring

HMW educate Warren's friends/family on how to recognize when these episodes occur

HMW provide Warren with a 24/7 support network?

How might we give Warren the best environment for his coping mechanisms

Appendix: HMWs for each POV

We met...

Rachel, a professor in her earlier 30s who became blind at age 25

We were amazed to realize...

She felt afraid to be out in public alone with her white cane

We wonder if this means...

She feels vulnerable outwardly expressing her visual impairment to strangers

It would be game changing to

Provide Rachel with a sense of security when out in public

How Might we ...

How might we weaponize white canes

How might we disguise white canes

How might we enable Rachel to identify the proximity of people around her in a non-visual way

HMW match people with complementary disabilities or able people willing to help?

HMW distract Rachel from her fears when she travels?

HMW compensate strangers who help Rachel during her travels?

How might we provide channels to connect with personnel to protect

How might we provide safer outdoor environments for everyone

HMW partner with local authorities or established security officials

HMW involve Rachael's friends and family to make her feel more comfortable?

How might we empower her to feel confident outside

HMW camouflage Rachel as a sighted person

HMW make walking with a cane more normalized?

How might we help Rachel to get around without a cane?

HMW vocalize the landscape on Rachel's walk

Appendix: HMWs for each POV

We met...

Mercy, a stay-at-home mom of a daughter with Sotos Syndrome who teaches all-inclusive fitness classes

We were amazed to realize...

Mercy wouldn't let Sammy go to foothill college until COVID caused online learning because then she could watch over her while she was on Zoom.

We wonder if this means...

She gets anxious about letting Sammy go out on her own and wonders if she'll be able to conform to the social and educational standards

It would be game changing to

Give Mercy peace of mind that her daughter is getting adequate support in class

How Might we ...

How might we make student performance more available to the parents of students with learning disabilities

Empower Mercy's daughter to assuage her mother's fears about lack of support.

How might we relieve Mercy's anxiety

How might we give Mercy a live feed of her daughter's actions

How might we convince Mercy's mom that she's being overbearing

HMW notify Mercy of her daughter's actions and whereabouts?

How might we get Foothill College to let Mercy go to class with her daughter

HMW connect Sammy with a "buddy" that keeps her accountable

HMW enable Sammy to defend herself

HMW make Sammy want to stay in class?

How might we ensure that she cannot wander off of campus?

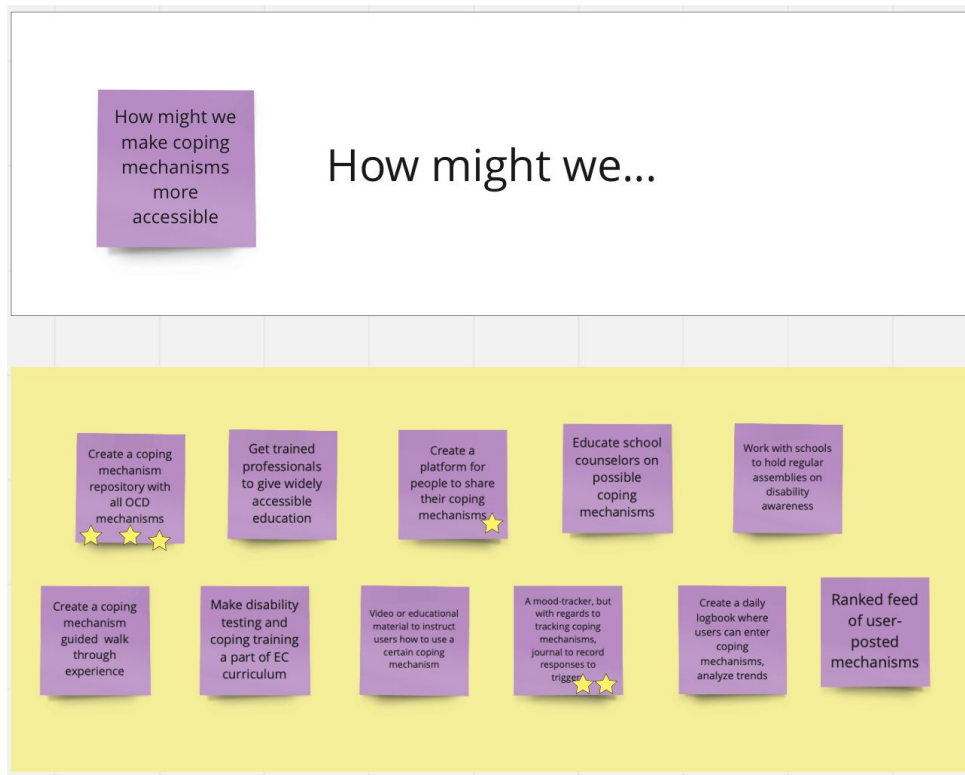
HMW enable Mercy to screen whoever Sammy interacts with

HMW compensate Sammy for staying in class?

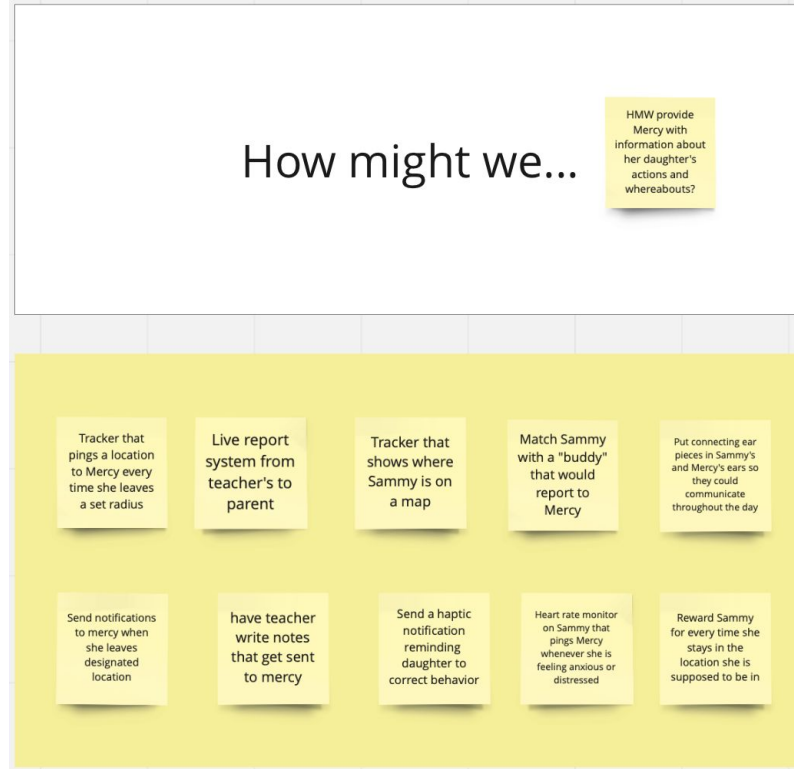
How might we deter strangers or nefarious individuals from engaging with Sammy

HMW help Sammy identify potentially dangerous people/situations

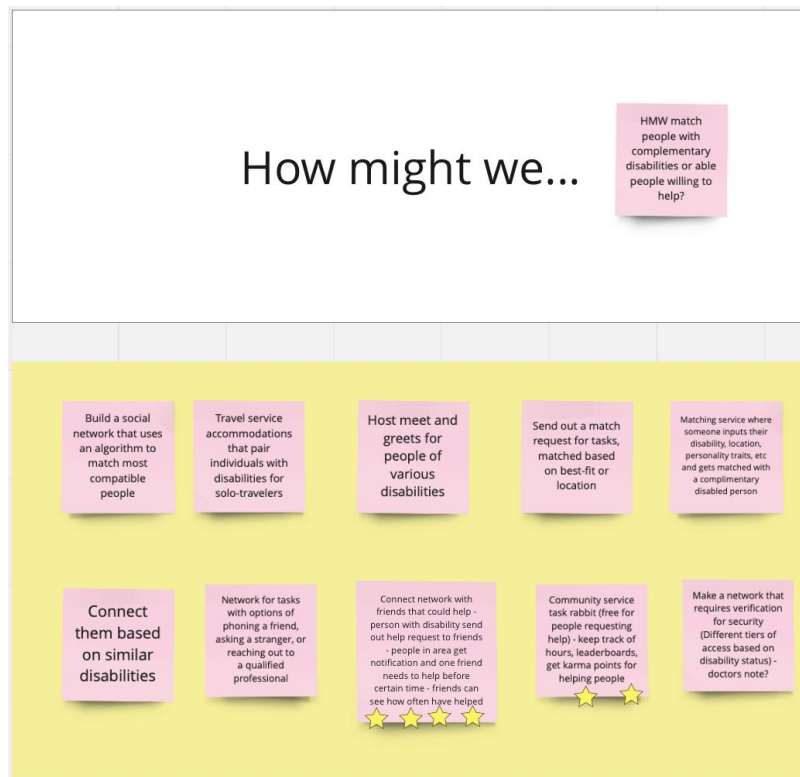
Appendix: Solutions for each HMW



Appendix: Solutions for each HMW





Appendix: Solutions for each HMW



Appendix: Google Form Prototype Questions

Daily Journal & Reflection

 kradz@stanford.edu (not shared) [Switch account](#) 

Rate your mood today:

1 2 3 4 5

Not doing so great ☒ ☐ ☐ ☐ ☐ Amazing

What contributed to your mood today?

Your answer

Did you experience a trigger today?

☐ Yes

☐ No

☐ Other: _____

If yes, describe your experience:

Your answer

What contributed to your mood today?

Your answer

Did you experience a trigger today?

☐ Yes

☐ No

☐ Other: _____

If yes, describe your experience:

Your answer



How many times have you experienced this trigger before?

Your answer

[Submit](#) [Clear form](#)

Never submit passwords through Google Forms.

Journal Reflection

 kradz@stanford.edu (not shared) [Switch account](#) 

How did it make you feel to confront your triggers every day?

Your answer

Was it more helpful or unhelpful to confronting your triggers?

Your answer

[Submit](#) [Clear form](#)

Never submit passwords through Google Forms.