Through Our Eyes:

Inclusive Design as Visually Impaired Users

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Abstract

Through Our Eyes: Inclusive Design as Visually Impaired Users

Angela Piccolo

Chair of the Supervisory Committee:
Professor, Christopher Ozubko
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This project explores the need for designers to be more educated about visual challenges and inclusive design as a whole. Along with visual impairment and blindness (permanent conditions) there are also temporary and situational conditions that can create visual challenges. A set of persona activity cards were created to help designers better understand the full range of challenges a visually reliant world creates.

THROUGH OUR EYES

INCLUSIVE DESIGN AS VISUALLY IMPAIRED USERS

ANGELA PICCOLO

MASTER OF DESIGN THESIS DOCUMENTATION

CONTENTS

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INTRODUCTION

There is a plethora of misconceptions which are present within and between the visually impaired and sighted communities. There is disconnect between the communities which are pulling them farther apart. There is a lack of being able to relate and empathize with one another. For the scope of my thesis project I have chosen to focus on helping the sighted community better understand visual challenges which exist including not only permanent conditions such as glaucoma or diabetic retinopathy but temporary and situational conditions.

My main objective is to create a collective resource to aid designers in making effective solutions which will be inclusive and flexible for individuals of all visual abilities. In this document, I will first give an overview of my secondary and primary research, followed by sharing my design process, my final designs, my findings and overall experience of working on this project.

SIGNIFICANCE

I was born with a rare eye condition called Anaridia. This means the irises in my eyes never fully developed. Due to this condition, I am mildly visually impaired. When I was in elementary school my doctor thought I would be fully blind before I became an adult. To prepare for this, I was taught braille from kindergarten through high school. In addition, I had orientation and mobility lessons where I was taught how to get around buildings and city streets. I have been fortunate to only have slight vision loss and live a “normal” life but because of my experiences, I have a genuine passion to help those in the visually impaired community. I have met many visually impaired people and been able to see the struggles that come with their challenges but also how they overcome them and adapt to their environment as needed. In high school, I had the opportunity to work as an assistant to my teachers to work with

younger children who are visually impairaed as well. This experience helped me build a love for helping my visually impaired community. Before starting graduate school I received a degree in psychology and one in visual design. I have always wanted to find a way to combine my two passions to make an impact on others lives and I couldn't be happier that I have found a way to contribute help those with disabilities especially visual impairments.

Currently there is a big hype around accessibility and equality for those with disabilities. Through my research, I have found inclusive design methods to have a lot of potential in making designs more flexible and inclusive to people with disabilities. Inclusive design is not limited to disabilities but the methodology applies to all minority groups that are being excluded such as age, race, and gender.

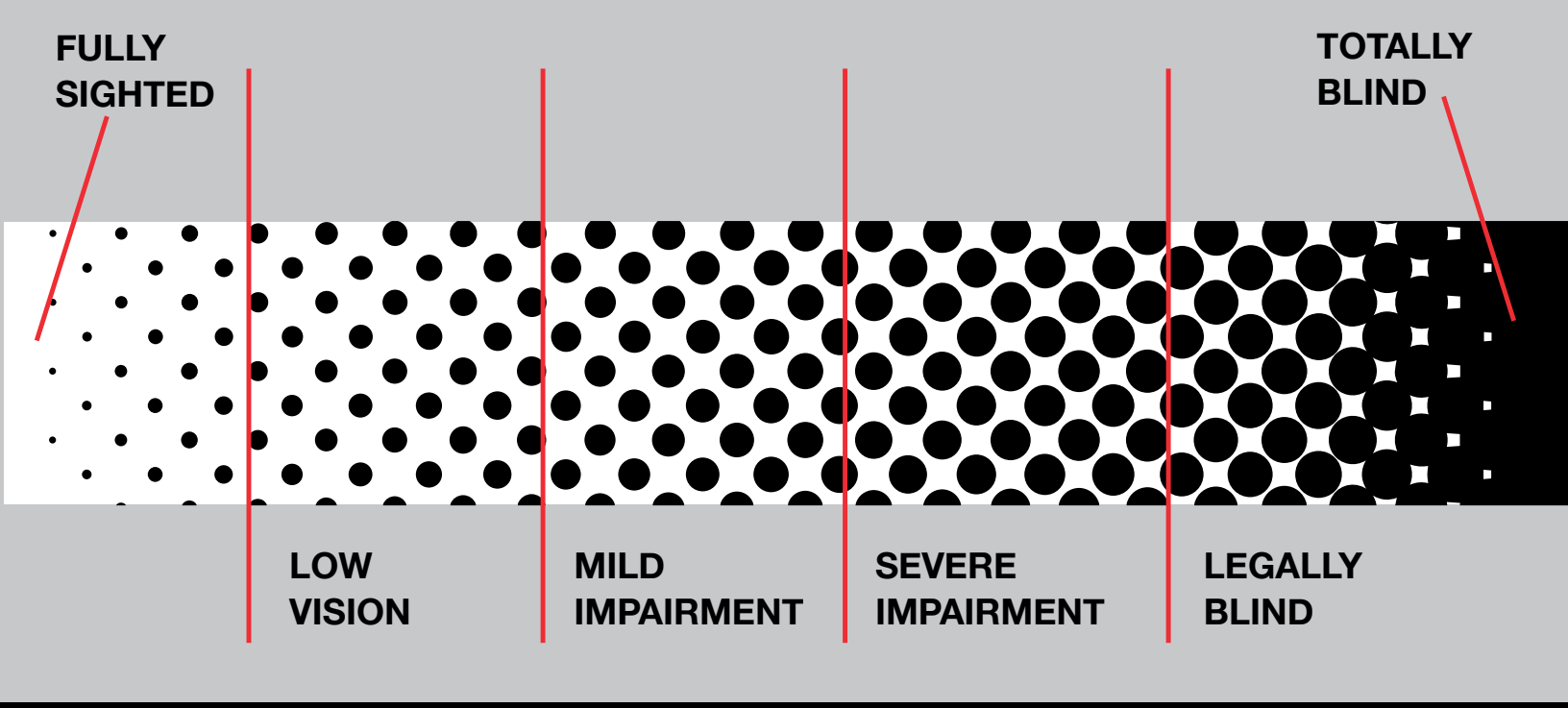
"When were finally able to question the systems that disable us, everyone involved stops seeing out bodies as the problem".

Liz Jackson, 2019

BACKGROUND

There is a wide spectrum of different visual impairments that exist. This ranges from low vision, which can be corrected with glasses and/or contacts to totally blind, where there is no vision or light perception. It is also important to note there is a significant amount of people who are visually impaired with uncorrectable vision meaning glasses, contacts, or other treatments such as surgery cannot improve their vision. Within the spectrum of visual impairments there are some leading causes which include uncorrected refractive errors, cataracts, macular degeneration, diabetic retinopathy, and glaucoma ("WHO | Vision impairment and blindness,"2018). When vision is talked about it is usually referred to with a visual acuity to help understand the severity of the visual impairment.

A measurement of 20/20 visual acuity is considered to be perfect vision. The meaning of this number is if the average person can see an object clearly from 20 feet away, then someone with a visual acuity of 20 can also see the same object from 20 feet away as well. If someone has a visual acuity of 20/200 then



that person can see what an average person see from 200 feet away, 20 feet away. Once someone has the visual acuity of 20/300 or 20/400 it becomes inaccurate to measure.

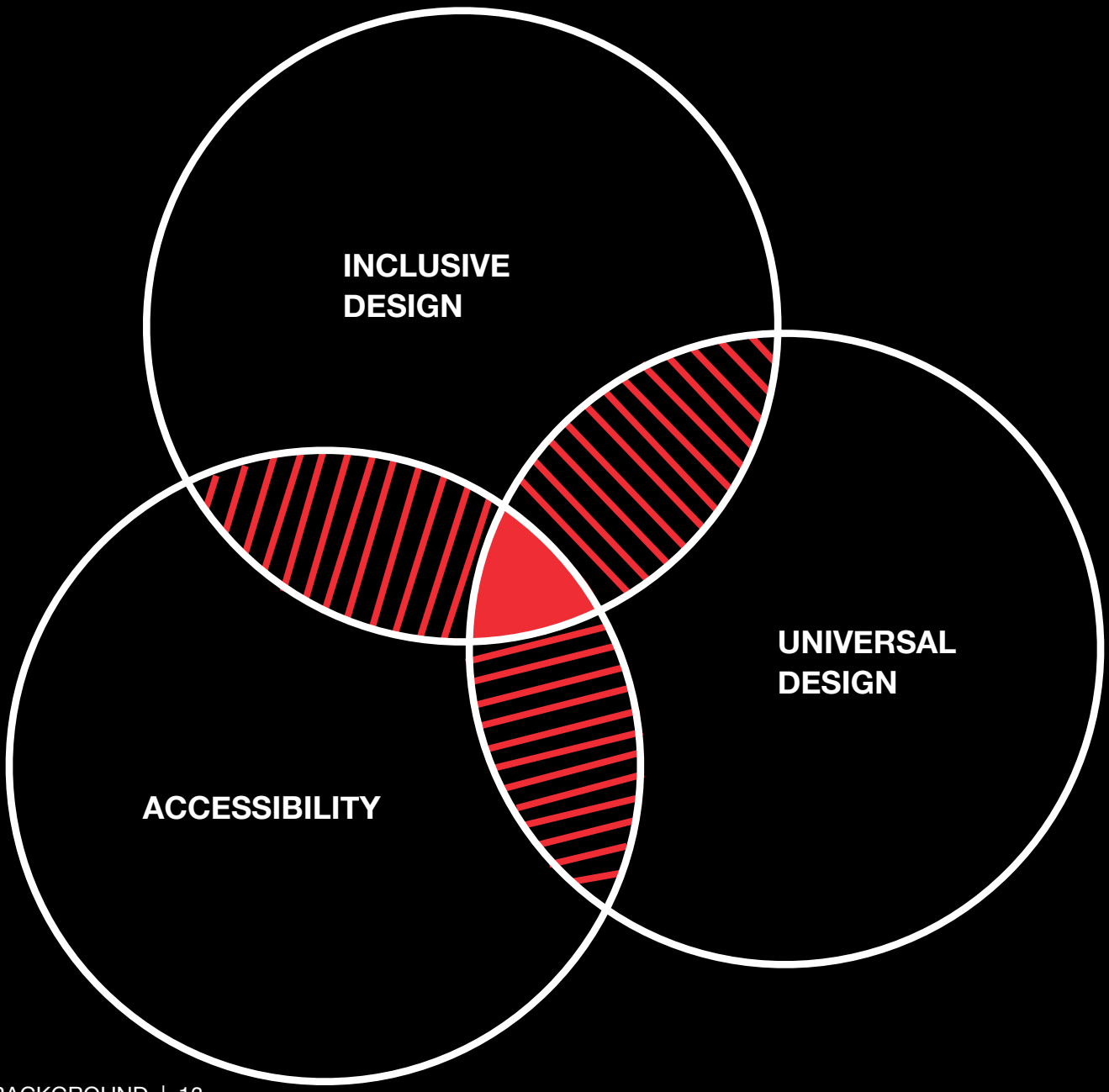
Beyond that point the main distinguishing factors are whether a person has light perception and if they can recognize different shapes or color.

What is a visual impairment? Visual impairment is when a person's best-corrected [including with glasses or contacts] visual acuity in their better-seeing eye is 20/70 or worse (mild visual impairment) to severe visual impairment [or legally blind] of 20/200 and total blindness at 20/400 ("WHO | Vision impairment and blindness,"2018). According to these definitions, there is an estimated 217 million people are who are moderate to severely visually impaired and 36 million people who are blind (Bourne et al., 2017). There is an

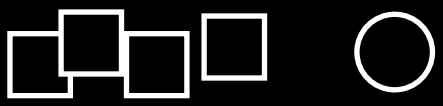
estimated 828 million who are near sighted (“WHO | Vision impairment and blindness,”2018), which means they can see things that are close in proximity to them but have a difficult time seeing things that are farther in the distance. We also need to consider other impairments such as color blindness. “Color blindness affects approximately 1 in 12 men (8%) and 1 in 200 women in the world,” (“Colour Blindness,” n.d.). In addition there are also people who only see a couple of colors or even a monochromatic palette meaning they see everything in one color with shade variations. This just scratches the surface of permanent challenges that exist and we will look at this in more detail later on.

“ Inclusive design might not lead to universal designs. Universal designs might not involve the participation of excluded communities. Accessible solutions aren’t always designed to consider human diversity or emotional qualities like beauty or dignity. They simply need to provide access”.

Kat Holmes, 2018



INCLUSIVE DESIGN



RECOGNIZE EXCLUSION

LEARN FROM DIVERSITY

SOLVE FOR ONE,
EXTEND TO MANY

While practicing inclusive design should make a design more accessible, it's not a process for meeting all accessibility standards (Holmes, 2018). Explained further in her book, Mismatch, Kat Holmes, talks about how inclusive design first recognizes a group of people who are being excluded from a design. Second, we should then learn from the diversity of people who are using the design. And then finally, design for the excluded group of people and extend the solutions to many to make a design improved and functional for a larger group of people. I feel this methodology is helpful because it draws on the strengthens of people who have been forced to find alternate solutions because the current design does not work for them. This then gives a designer more inspiration and uniqueness to explore while solving the problem to work for a wider

PERMANENT

TEMPORARY

SITUATIONAL

audience. It is also important to note inclusive design focuses on including people throughout the design process but does not necessarily mean the excluded group would all be included in the final product, service or environment (Holmes, 2018).

A good inclusive design would have a variety of approaches for a user to widen the audiences experience and reach. It is important for us to now go over what universal design and accessibility is and how they can all overlap in order to better understand inclusive design. We will also go over some examples that would fit in each of these definitions.

ACCESSIBILITY

The term accessibility is probably the most known term people use when talking about disabilities. The Interaction Design Foundation defines accessibility as, “[a] users’ ability to use products/services, but not the extent to which they can attain goals (usability). Designers should create output accommodating the needs of all potential users, be they disabled (e.g., color-blind users) or anyone facing situational barriers (e.g., being forced to multitask)(“What is Accessibility?,” n.d.). Accessibility is an attribute that make a product, service, or environment work for someone with a disability. Whereas, inclusive design is a methodology not an attribute (Holmes, 2018). Some good examples of accessibility would be adding braille, closed captions, a ramp, screen reader friendly, etc. To make your design adaptable for those with disabilities.

UNIVERSAL DESIGN

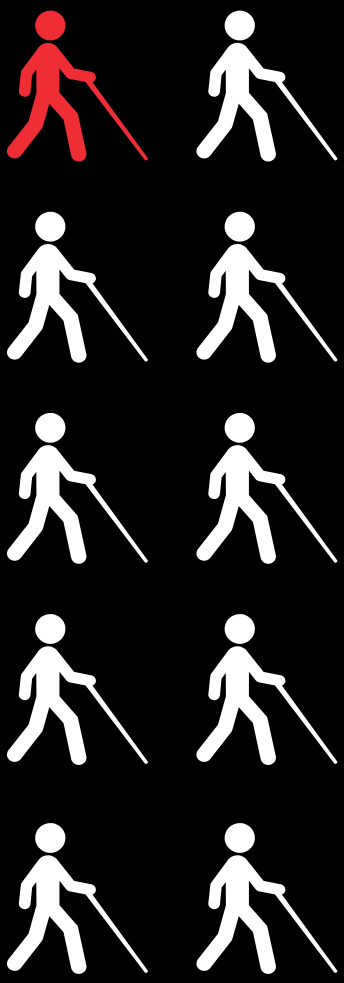
Universal Design is a concept that was created with the context of environments and spaces being usable by people of all ages and abilities. The goal is to make a design usable by everyone without needing any adaption to the design (Story, Mueller, & Mace, 1998). In contrast, inclusive design is not trying to create a design which works for all individuals but instead is designing for an excluded group in mind in hopes it can work for a wider range of people.

Another important distinction for universal design is it focus on making sure the final result works for everyone. It doesn't necessarily consider excluded groups during the design process. As long as the final result is inclusive then it is successful (Kat Holmes, 2018).

ADA GUIDELINES

BRAILLE LITERATE USERS: >10%

("APH — American Printing House for the Blind," 2017).

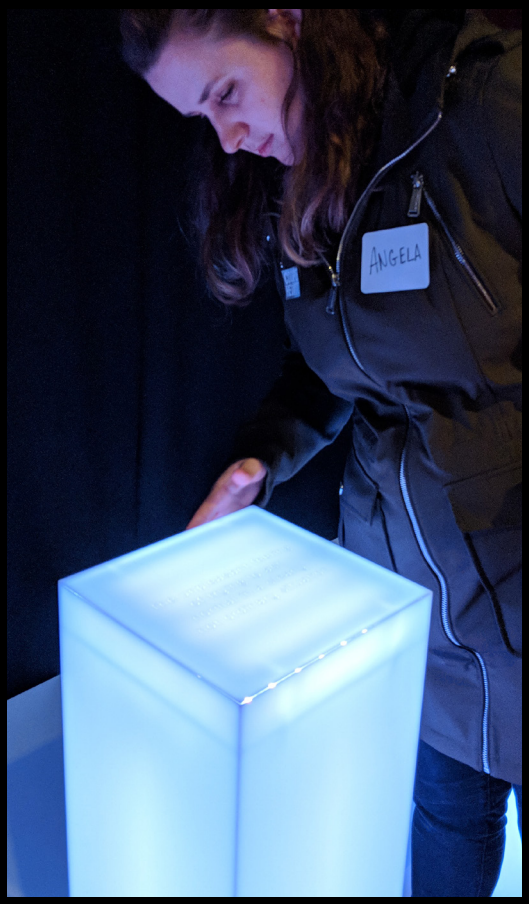


ADA guidelines have recognized the need for regulations to help those with disabilities and have given individuals rights which did not exist until 1990 when Congress passed the law ("The Americans With Disabilities Act of 1990," 2010). The requirements and recommendations in the standards regarding signage cover basic physical aspects to create legibility these include size, typography, and symbols or icons. While these guidelines are helpful they fail to address some important aspects of visual and non-visual cues such as contrast, placement, texture, and illumination to help with wayfinding (Arditi, 2017). We also need to take consideration the fact that though we have these ADA guidelines they are not enforced unless a building is renovated or built from the ground up (Rousek & Hallbeck, 2011). The ADA guidelines are complex and difficult to apply to a design. They also do not give recommendations how to improve a design but simply what not to do. We need to consider a resource for designers to inspire them to want to be inclusive instead of dreading to follow the law.

NEW YORK CITY

In April 2018, I took a trip to New York City with my sister Melissa. This was the first time either of us had been to the Big Apple. My first impressions of the city were the sheer amount of people everywhere. There were people in cars, taxis, buses, bikes, and pedestrians. The constant loud noises of horns, people, and vehicles was a constant sound that was very prominent. There was a large wave of smells walking down the street ranging from trash to pastries and food of all kinds. Visually there was so many signs, billboards, buildings it was very overwhelming to take it all in. I felt a huge sensory overload and had a desire to escape it all quite early on.

Melissa and I were in New York for five days. We mostly walked to all our destinations or used the subway system to get around. A big part of our trip was being able to navigate from one unfamiliar location to the next. This proofed to be challenging and we quickly learned we have different approaches to getting around. This kick started into my further research into wayfinding systems.



DIALECT FOR A NEW ERA, 2017-18

This was six illuminated pillars that had text on the top that was engraved and then braille on the back side. There was a button on one side that made the pillar emit smells, sound and vibration. The multi-sensory abilities of these pillars make accessible to a wide range of people.

COOPER HEWITT

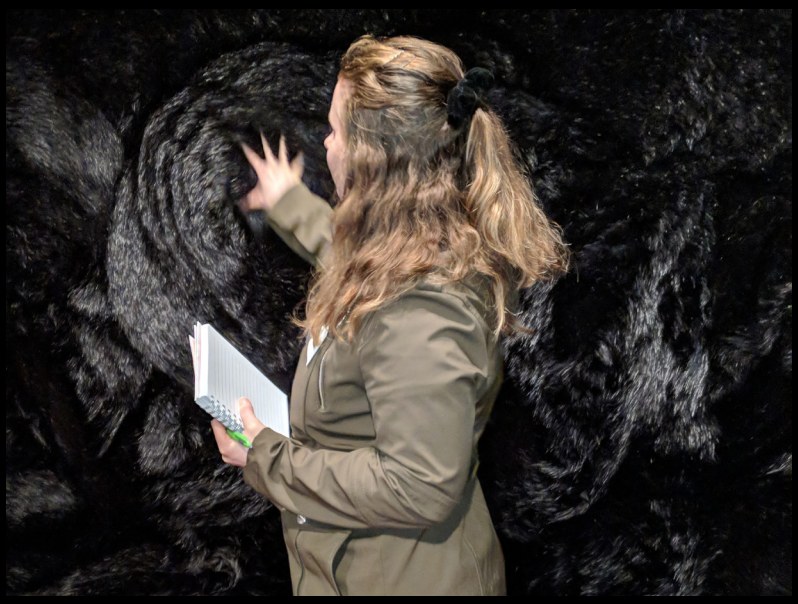
I attend a guided tour at the Cooper Hewitt, Smithsonian Design Museum. This tour was for the The Senses: Design Beyond Vision exhibition. This exhibition featured over 65 innovative projects which all are multi-sensory making the designs accessible for a larger array of diverse users. The projects celebrates the use of all five senses (touch, smell, taste, sound, and vision) and displays unique explorations which may not originally been thought of.

The design and layout of the exhibition was accessible for people with all abilities including Braille on all labels and a scannable code which directs you to the Cooper Hewitt app which included text and audio descriptions of each project in the exhibition.

The guided tour was given by the curators of the exhibit, Ellen Lupton and Andrea Lipps. This tour was a unique experience for blind and visually impaired individuals to experience the exhibition with the curators and have special privileges to interact with projects more intensely than the average visitor.

TACTILE ORCHESTRA, 2017–18

A soft fluffy wall made out of black long velvet material that when touched would play orchestra music with varying volumes depending on the amount of pressure put on the wall. This was a very fun wall to interact with and was inspiring for the possibilities that could be applied in functional situations.



I personally enjoyed this experience for two main reasons, First, I got to ask questions about the exhibit and designers who are involved from the curators. It was wonderful to have an inside look into the project and to gain insight on how I can implement elements in my thesis project. I was able to share a little about my thesis project with the curators and they pointed out specific projects or details they thought would be helpful for me. Secondly, I was on the tour with six other individuals who were visually impaired. I had the most sight of all the individuals on the tour and so it gave me the opportunity to observe a range of reactions to projects from people who have more vision loss than me. This helped me gain insights into what elements were useful and confusing to them.

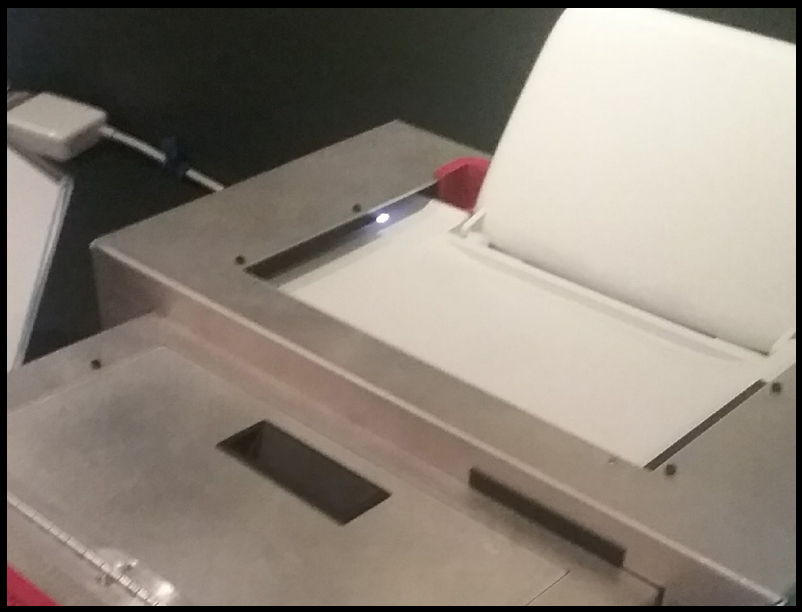
Overall, I thought my trip to the Cooper Hewitt was very helpful to kick start my research of how people are already working to be inclusive of all abilities. I will share specific projects now that I found inspiring or relevant to my thesis research.

TACTILE HEADSET, 2014–17

A set of four wooden speakers that vibrate different patterns to help the user feel the beat and mood with vibration instead of audio only.

SEATED CATALOG OF FEELINGS, 2012-18

A metal framed chair with soft cushion to sit on. The visitor sits in the chair and wears headphones. A narrator reads the feeling you are about to experience which is also displayed with a projected light on the floor in front of you. Then you hear and feel vibrations under your bottom and back that mimic the feeling that was expressed. There is also a visualization above your head for outside observers to see. This was a unique experience and although it had visual and audio components they were not necessary to enjoy it. They also had a station dedicated for wheelchairs to get a similar modified experience without having to get our of their wheelchair. It was neat experience to see the blind visitors in my group really enjoy this project.



TACTILE PRINTER

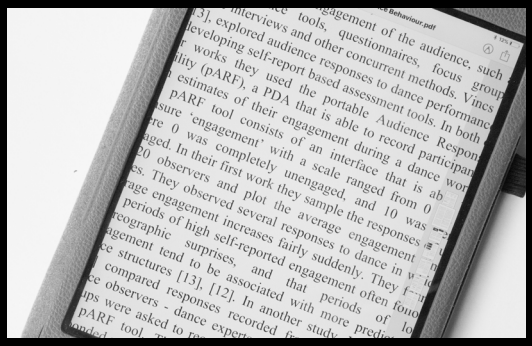
A printer that is being developed to print raised dots and lines to make prints tactile beyond braille dots. This opens up to a lot of possibilities to make a print materials multi-sensory.

DEAF-BLIND TALK

I attended an event on University of Washington campus. The purpose of this event was for people who are deaf-blind to come together and talk about their experiences and learn from each other. The public was also allowed to go to the event and observe. The general audience sat in the normal auditorium seats while the deaf-blind participants sat on the stage along with any interpreters and helpers for the participants.

There was also a screen with the large print for people to read along with to help with understanding what it is being said as it was not always verbal. The majority of people participated through sign language of some type including regular with a variety of tactile ways of receiving from on their hand to their back, etc.

Here are my insights:
1. Having multiple ways for people to participate increases the inclusivity of an event/design.
2. For the amount of different ways people where participating the event was fairly smooth and didn't feel uncomfortable or odd.



A. INCREASE FONT SIZE

B. ASSISTIVE TECHNOLOGY

TRACKING HOW I ADAPT

For part of primary research. I tracked the different ways I adapt to do daily tasks as a visually impaired user. Along with tracking my senses I learned two insights from my tracking.

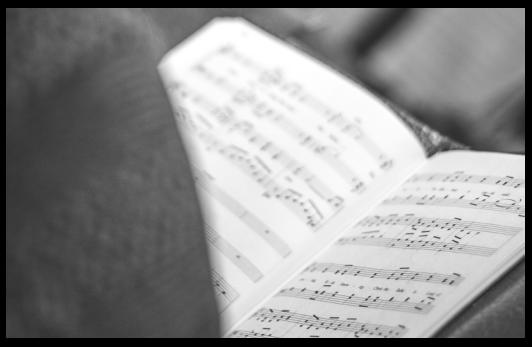
1. I tried to use my other senses whenever possible to rely less on my vision to get tasks done.
2. When something is exclusively visual and I can't effectively use it I start to use assistance such as a magnifying glass, taking a picture so I can zoom in or asking for help.

Pictured are some examples I use the most frequently.
A. When possible I will increase the font size for an e-book, documents on my computer, text on my phone or items I print out.

B. I use assistive technology to help me limit my screen time. I use Alexa while at home and Siri on my Apple products. I will do a range of tasks using it including setting reminders, alarms, using my calendar, texting, questions, weather, and playing music.

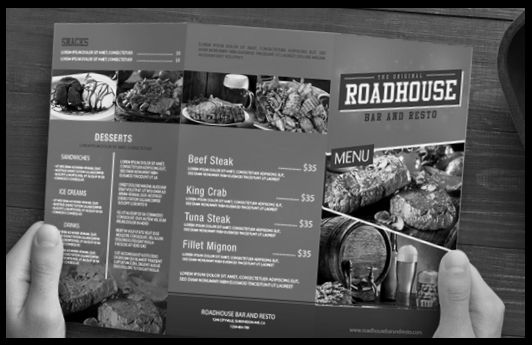
C. LISTEN FOR STOPS

C. When using public transportation I listen for the stops when they are announced instead of straining my eyes to read the signs when I am too far away.



D. MEMORIZE AHEAD

D. It is a common practice for me to memorize content ahead of time. A big one for me is choral music. It is hard for me to sight read music and follow the conductor at the same time so I spend some time ahead of time memorizing the music so I don't have to keep my head in my music during rehearsal.

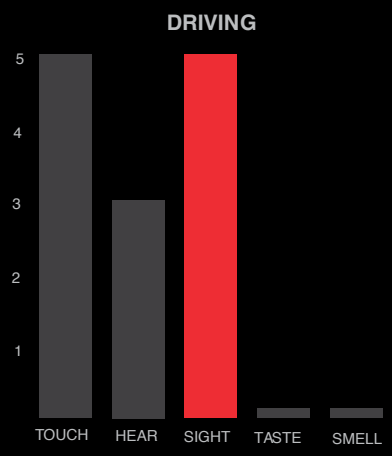


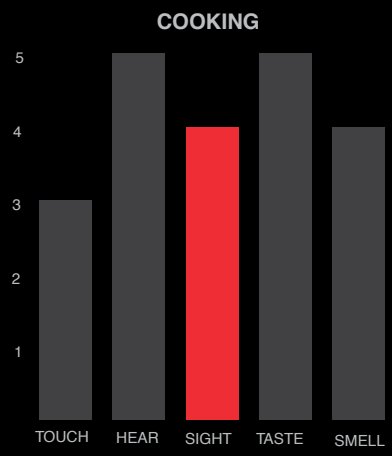
E. RESEARCH AHEAD

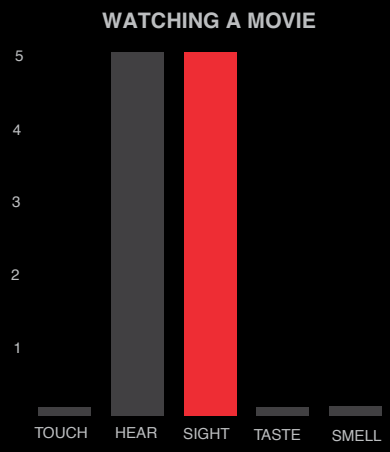
E. I am going somewhere I will need to read text for example going out to eat I always research ahead for a menu so that I can decide before arriving what to order. Especially when I am with other people.

F. MAGNIFY SMALL INFORMATION

F. I will use my magnifying glass for small information on pill containers or food labels, etc. This helps me get the information I wouldn't be able to read without the aid.







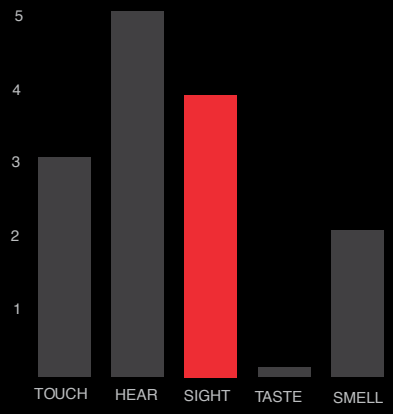
TRACKING MY SENSES

I tracked how I use my senses. I thought it would be a informative experience to track for a couple weeks daily tasks I do and rate on a 1 to 5 scale how much I use my five senses in those scenarios. I found the things I need fit into two different categories.

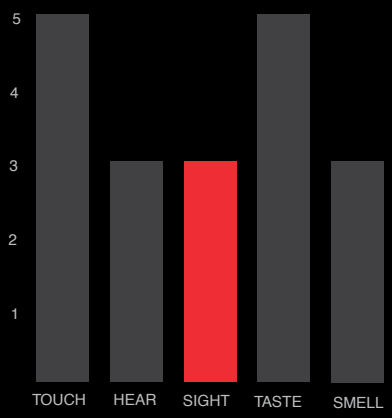
1. Tasks where I use other senses than my vision to complete it whether it is listening to audio or taking shower. There were also tasks that someone who is fully sighted would perhaps use their vision to complete that I don't. For example, opening jars with tabs and tying shoes I do this all by touch

2. There was a group of tasks that required me to rely on my vision including cooking, driving, and playing volleyball. Some of the tasks would not be possible without some vision and others I could adapt to be a similar experience to what I am used to if I were to loose more vision.

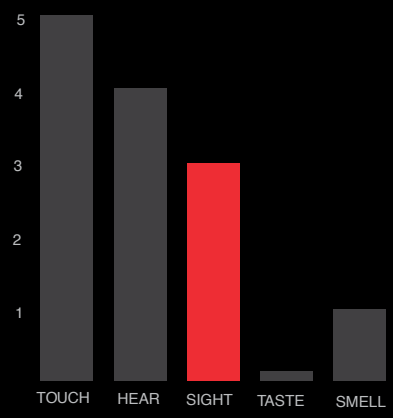
WALKING DOWNTOWN



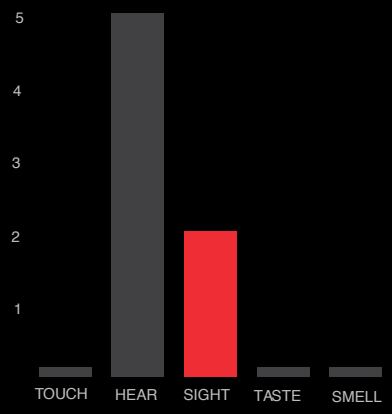
EATING TACOS



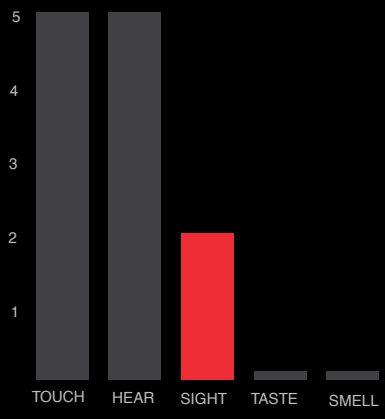
PLAYING VOLLEYBALL



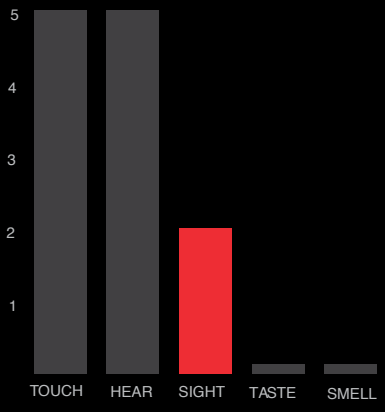
ORCHESTRA CONCERT



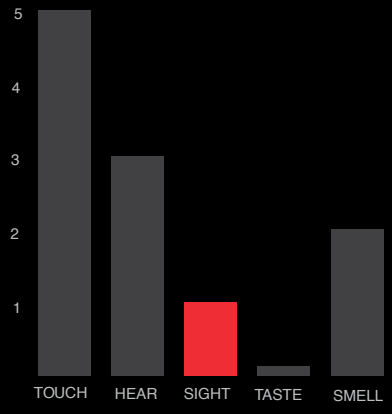
TYPING



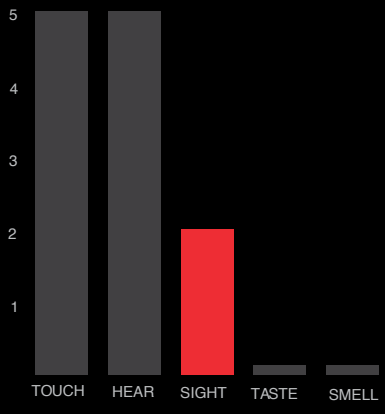
TICKLE FIGHT WITH CHILD



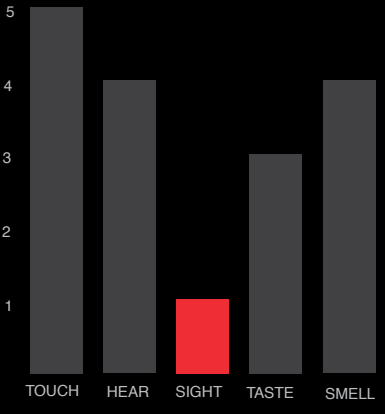
TAKING A SHOWER



PLAYING PIANO



KISSING



SUPPORT GROUP

At the beginning of my first year of grad school I found a Facebook group that was very helpful to my Research. It is a Visually Impaired and Blind Support Group. This is where people from the community all over the world come together and talk with others who understand their personal conditions. The topics range from complaining about sighted people, suggestions someone for visually impaired children, or when to tell a potential employer you are blind. It is place individuals to talk openly about resources and struggles.

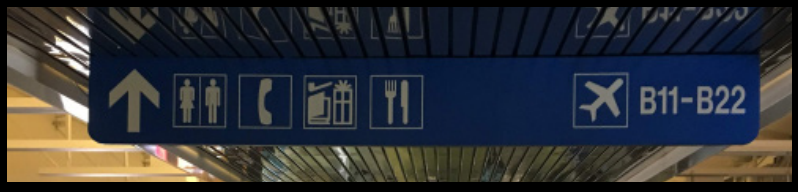
When I joined this group I actually found two people who have the rare eye condition I have. This was the first time I have ever met anyone else with Anaridia. I felt an instant connection to these individuals.

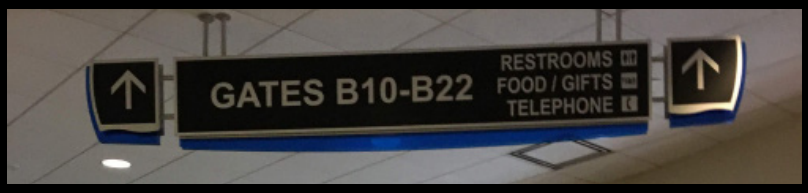
PHOTO JOURNAL

MAPS AND SIGNAGE ARE VISUALLY RELIANT

I was surprised to find that there was not a map in all of the buildings that I visited and when there was they were all visually reliant and the majority were too small for me to read with ease.

I walked around public buildings to learn about existing wayfinding systems. Some of the buildings I visited were on University of Washington (UW) Campus (Art Building, Music Building, the HUB, the Engineering Building) and 3 airports (SeaTac airport, SLC airport, and Boise airport). Below are some common patterns I found. These images focuses mainly on the things that can be improved on and doesn't cover what did work well. For example, the SeaTac Airport wayfinding is beautifully designed and really does a good job of being inclusive for international visitors and those with disabilities. I will focus more on the systems that have worked in future posts when I begin the design process.



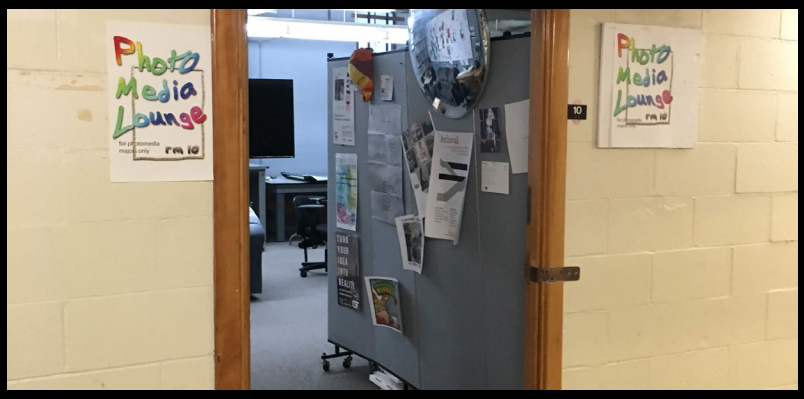


MULTIPLE VISUAL IDENTITIES ARE PRESENT

The next two images were both in the Boise, Idaho airport. It was like being in two different airports at the same time.

DUPLICATE INFORMATION ON SIGNAGE

A lot of the duplicate information is due to current ADA guidelines. As a visually impaired user I see it as excess visual noise.



PEOPLE ARE CREATING THEIR OWN SIGNS

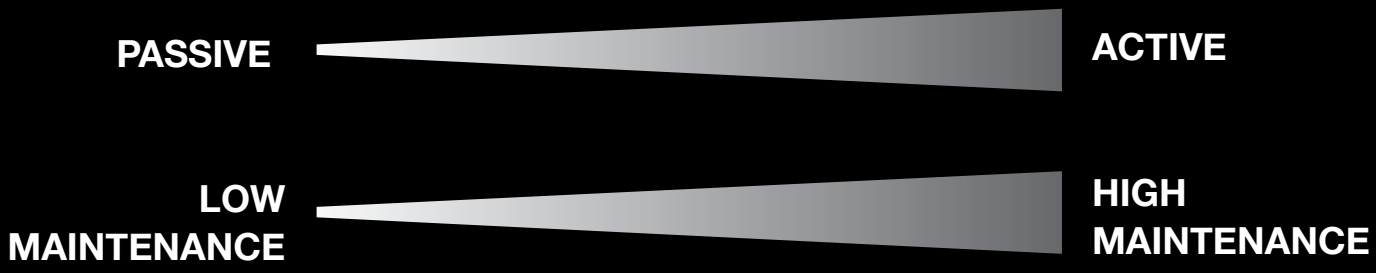
There were so many places people had created their own signs because the provided ones were not sufficient enough for their needs.

A LACK OF PROPER LIGHTING FOR SIGNAGE

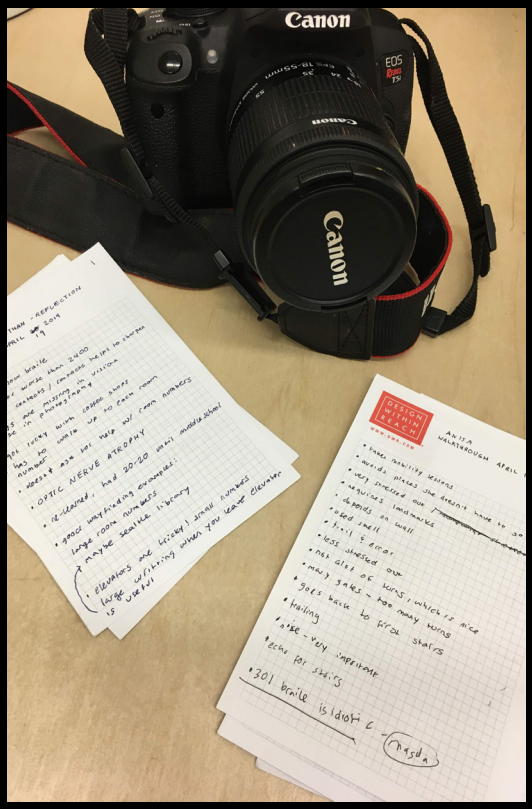
There was several places that had not sufficient lighting, which I mean what is the point of having a sign if you can't see it?

A LOT OF SURROUNDING VISUAL NOISE.

There were areas that had ads and building regulations, posters, art etc which added a lot of visual noise around the signage which could make someone visually impaired completely miss it.

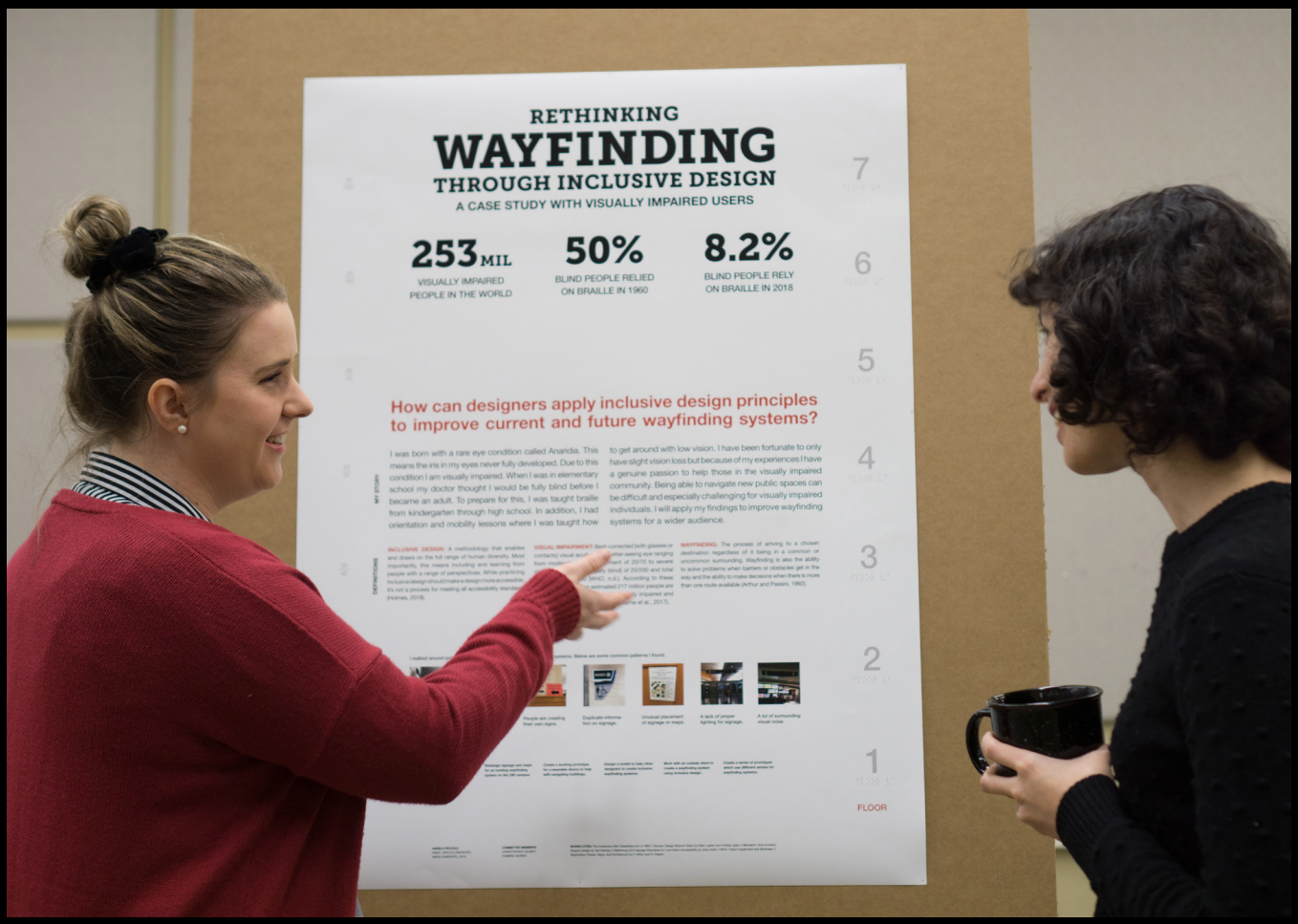


WALKTHROUGHS



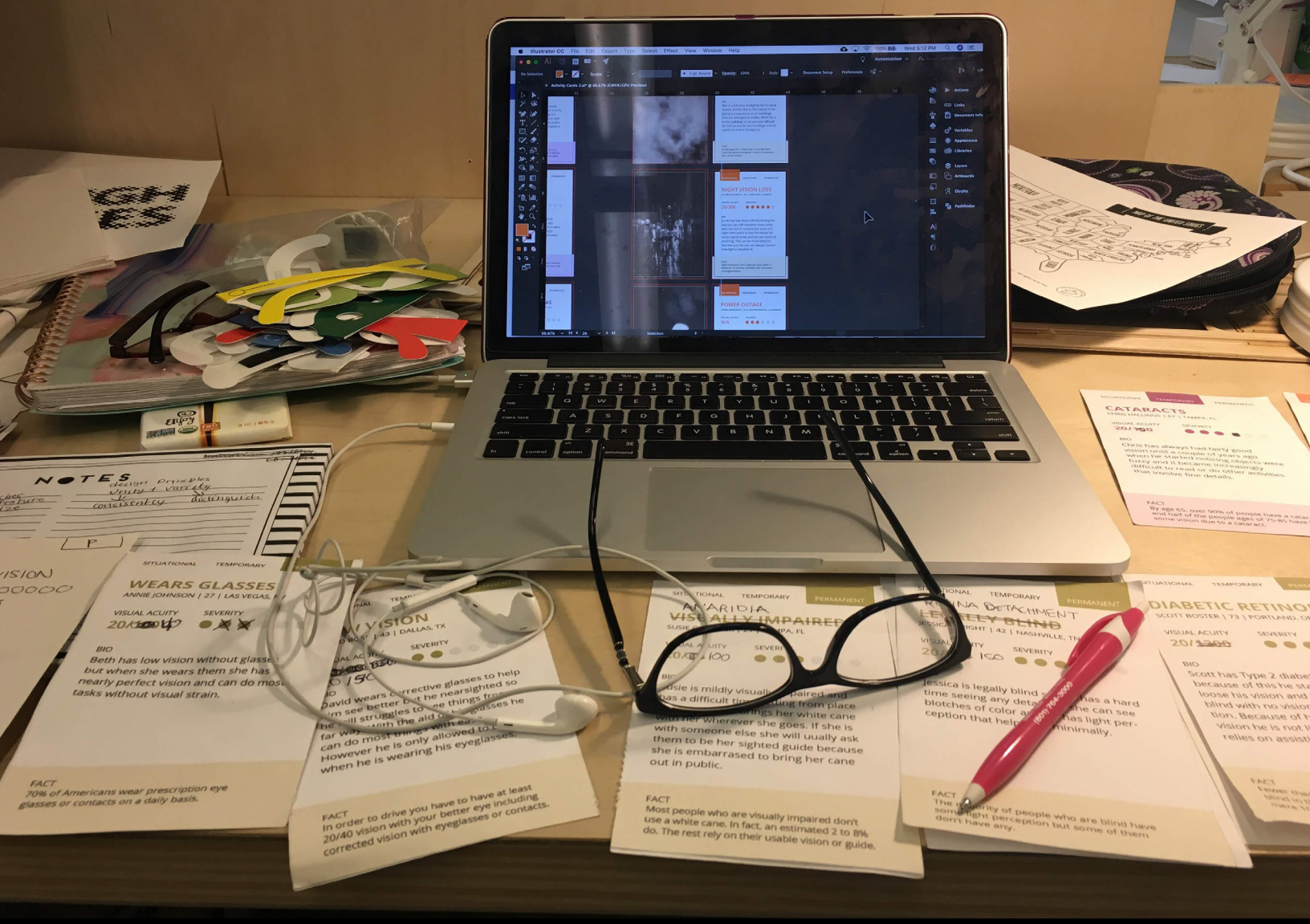
A large part of my primary research was a case study with wayfinding to focus on a specific issue that effects the visually impaired and sighted community. I had the privilege of having two visual impaired users come to the University of Washington Art Building. One of my participants was legally blind and the other was totally blind. When they arrived I asked both of them to complete a couple of tasks to get from point A to point B throughout the building. So I could observe their behavior and learn some insights to help with the rest of my project. I also followed up with an interview about the experience and getting around static buildings in general.

A couple of attributes I noticed make a big difference when it comes to the effectiveness of a wayfinding system is how passive (a robot guiding you) vs active (reading braille or running hand along wall) the experience is. A second attribute is how much maintenance the system requires in the building, for example is it just cleaning and updating every couple of years or are their objects used regularly that can get lost or broken to aid.



DESIGN GOALS

My goal is to provide a resource for designers which will educate them on the full spectrum of visual challenges and be able to apply the princples in practice throughout the design process. I hope to inspire designers to explore solutions they may have not thought of before while relying on sight.



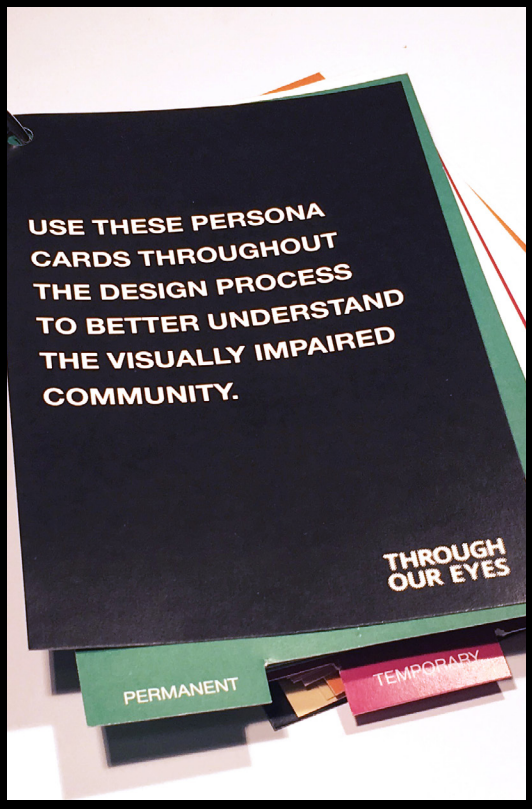
PROTOTYPING

I have spent this quarter prototyping and trying to distill all the information I have been researching. A major part of Inclusive Design is involving the excluded group of people within the design process. This will help designers see from their perspective and will give designers the potential to think of solutions they may have not seen from their own perspective. A common phrase within the disability

community is nothing about us without us, design with us not for us. When it comes to empathy for those with disabilities in design a common thing designers try to do is stimulate what it is like to be blind by wearing stimulated glasses or a blindfold, however; this oversimplifies how different every person disability is different. If we take the time to learn about the various levels of vision it will make it easier to empathize with them rather have pity or sympathize with them. If designers are going to include people with visual impairment is going to be important to understand the spectrum so they can work with them effectively.


SITUATIONAL
TEMPORARY
PERMANENT
CHRIS HALLING
67, Cataracts
Chris has developed cataracts in both of his eyes and it makes it difficult for him to read or do other activities that involve fine details.
If Chris used your design/product, what would his experience be like?
FACT: By age 65, over 90 percent of people have a cataract and half of the people between the ages of 75 and 85 have lost some vision due to a cataract.
FACT: People who are considered visually impaired have a visual acuity ranging from 20/70 to 20/200.


SITUATIONAL
TEMPORARY
PERMANENT
LOW VISION
DAVID ROSE | 32 | DALLAS, TX
VISUAL ACUITY
20/60
SEVERITY
BIO
David is a delivery driver for the company he works for. He wears corrective glasses to improve his vision because he nearsighted so he struggles to see things from far away. David is grateful for his eyeglasses because they make it possible for him to drive and do his job. He is however legally required to wear his eyeglasses while he is driving. When it is a sunny day he has a special pair of prescription glasses he wears to block the sun from distracting him.
FACT
Every state has different requirements in order to drive. In most states a person has to have at least 20/40 vision with your better eye which includes with corrected vision with eyeglasses or contacts. [3]
PERMANENT
SEVERITY
Kim has chronic migraines and when she has them she see auras which makes her vision blurry and difficult for her to focus her eyes. She usually has to take it easy and get some rest before they go away. This can inhibit her from being able to complete her daily tasks.
SITUATIONAL
TEMPORARY
PERMANENT
NIGHT VISION LOSS
JACOB HENDRICK | 43 | HENDERSON, NV
VISUAL ACUITY
20/300
SEVERITY
BIO
Jacob has low vision (20/50) during the day but can still complete most tasks with the aid of contacts but once it is night time and it is dark he looses his vision significantly and not see much of anything. This can be frustrating for him because can not always control how light a situation is.



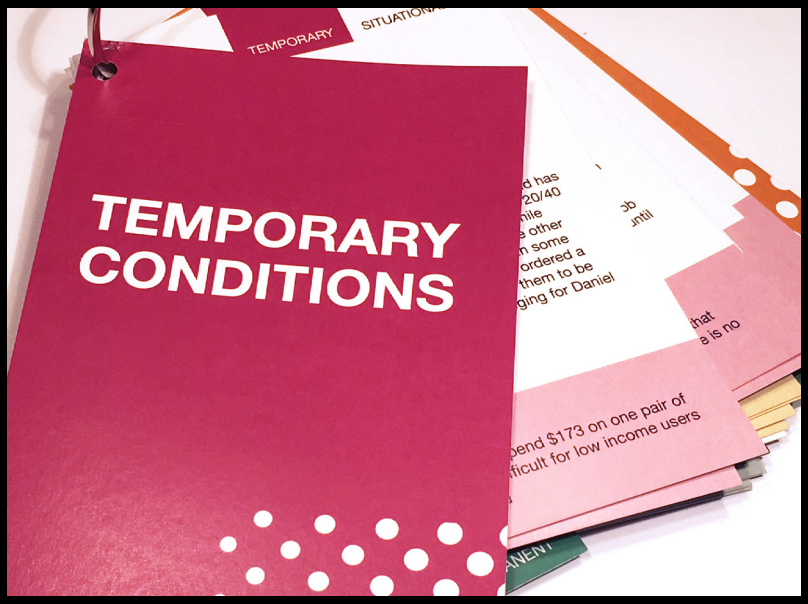
RESULTS

My main deliverable is a set of persona activity cards which can be used in a group session or as an individuals. The cards have personas that portray different visual challenges whether it is a permanent, temporary, or situational condition. The cards can be used to evaluate current design. Not all of the cards will be relevant to all designs so it would be up to the designer to decide which cards would be most relevant. The permanent persona cards are based on true life stories from visually impaired community to add authenticity to the cards.

PERMANENT CONDITIONS

These cards include the following conditions:

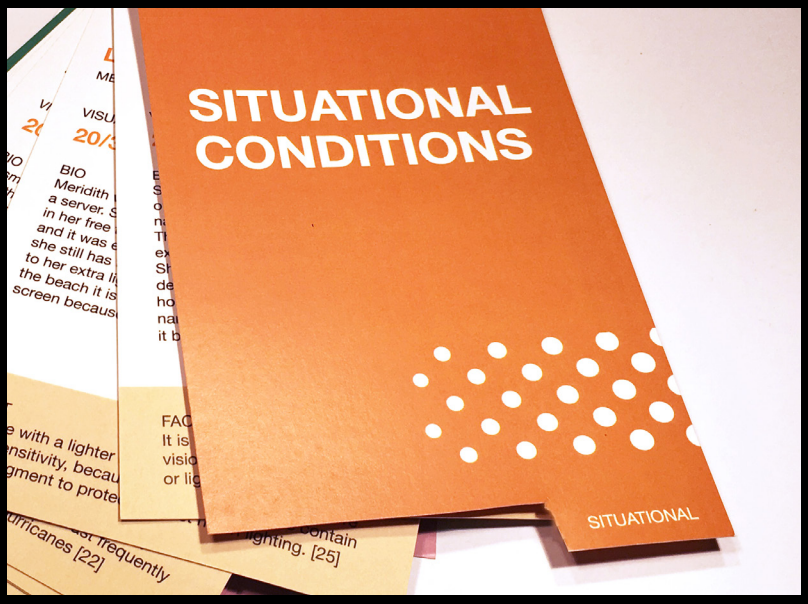
Ideal Vision, Wears Glasses, Low Vision, Anaridia, Macular Degeneration, Retinal Detachment, Diabetic Retinopathy, Glaucoma, Retinitis Pigmentiois, and Color Blind.



TEMPORARY CONDITIONS

These cards include the following conditions:

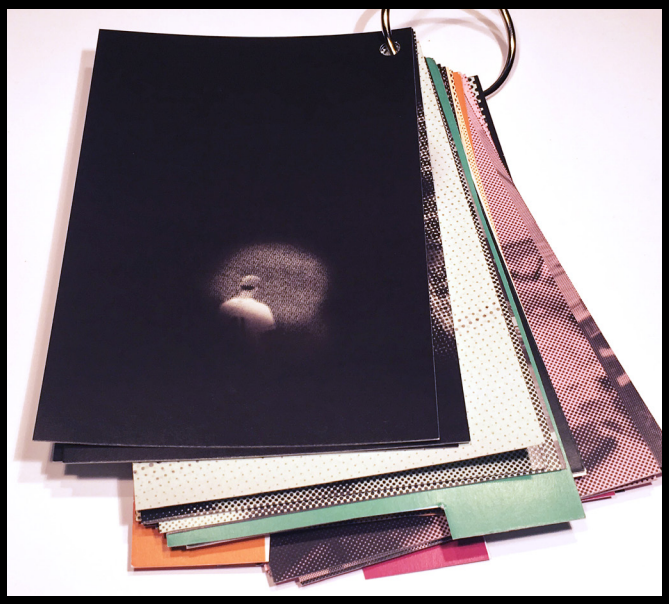
Broken Glasses, Cataracts, Migraine Auras, Conversion Disorder, Cutting an Onion, Dilated Eyes, Lack of Sleep, and Dry Contacts.



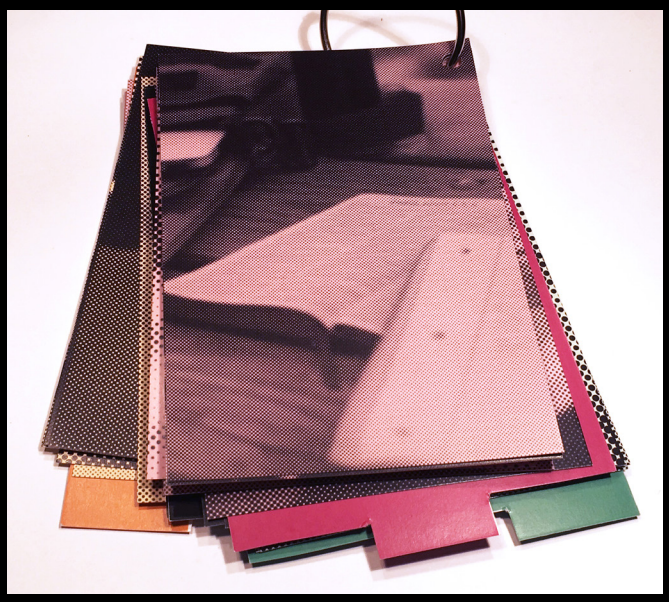
SITUATIONAL CONDITIONS

These cards include the following conditions:

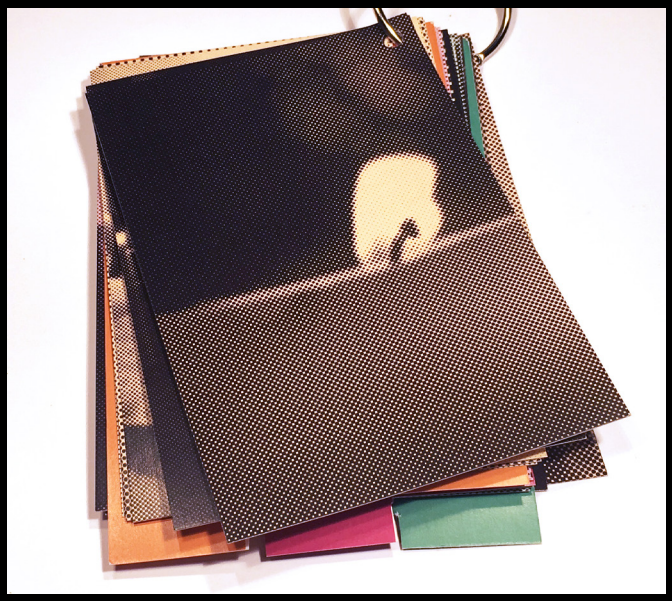
Thick Smoke, Night Vision Loss, Power Outage, Extreme Weather, Sprayed with Mace, Allergies, Light Sensitivity, and Pregnant.

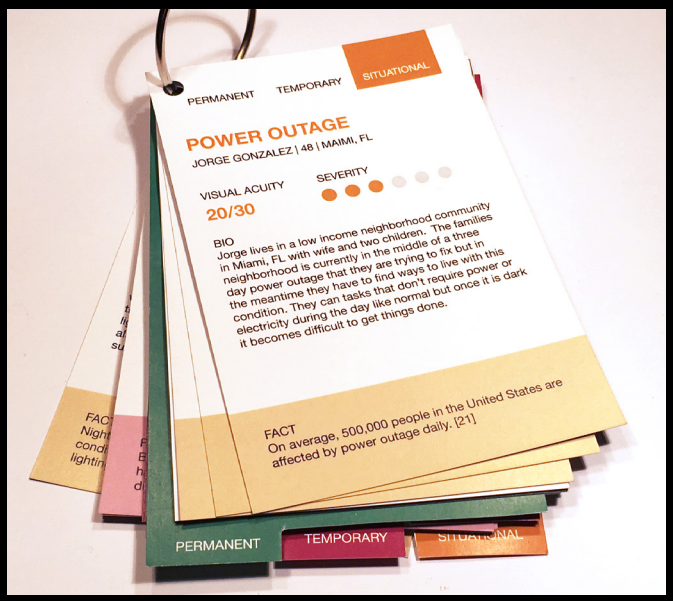



PERMANENT
TEMPORARY
SITUATIONAL
GLAUCOMA
MARTIN JONES | 75 | CHICAGO, IL
VISUAL ACUITY
20/400
SEVERITY
BIO
Martin is an avid Chicago Cubs fan. He buys season tickets every year to go with his sons. It has become increasingly difficult for him to see the players on the field and get a good picture of the whole game. This is because Martin has glaucoma which causes him to slowly loose his peripheral vision and only has pin hole vision in both eyes. Regardless of the adjustment of loosing his vision he still enjoys going to the ball games and has learned how to enjoy them through listening and enjoying the environment.
FACT
Glaucoma is a leading cause of blindness in African Americans and glaucoma tests should be started as early as age 35 to delay vision loss. [8]
SITUATIONAL
PERMANENT
TEMPORARY




PERMANENT
TEMPORARY
SITUATIONAL
LACK OF SLEEP
SEAN REYES | 24 | BOSTON, MA
VISUAL ACUITY
20/30
SEVERITY
BIO
Sean is a full-time student at Harvard University and because of his work load he doesn't get very much sleep. Last night wasn't an exception he only got 4 hours of sleep preparing for an exam. Throughout the day he noticed that everything around him is blurry and his eyes are have been watery. This distracts him from being able to focus on his studies.
FACT
There is approximately 40% of people in the US gets an average of less than 7 hours of sleep a night. [17]
SITUATIONAL
PERMANENT




PERMANENT
TEMPORARY
SITUATIONAL
POWER OUTAGE
JORGE GONZALEZ | 48 | MAIMI, FL
VISUAL ACUITY
20/30
SEVERITY
BIO
Jorge lives in a low income neighborhood community in Miami, FL with wife and two children. The families neighborhood is currently in the middle of a three day power outage that they are trying to fix but in the meantime they have to find ways to live with this condition. They can tasks that don't require power or electricity during the day like normal but once it is dark it becomes difficult to get things done.
FACT
On average, 500,000 people in the United States are affected by power outage daily. [21]
PERMANENT
TEMPORARY

HENRY ART GALLERY

For my Henry Art Gallery (on University of Washington campus) exhibition I really wanted to focus on creating an interactive space where guests could have a hands on approach but also be to just observe and get information out of it.

I created to sections for my exhibition. The first, the where guests can come up to a shelf with eight pairs of glasses. These glasses represent different parts of the visual spectrum and show the full range of permanent visual conditions. I wanted to make sure to show all parts of the spectrum and not focus only on the 'worst' conditions. This was to help visualize we all fit in the spectrum and we can learn from one another.
The second part of my exhibition is an activity the

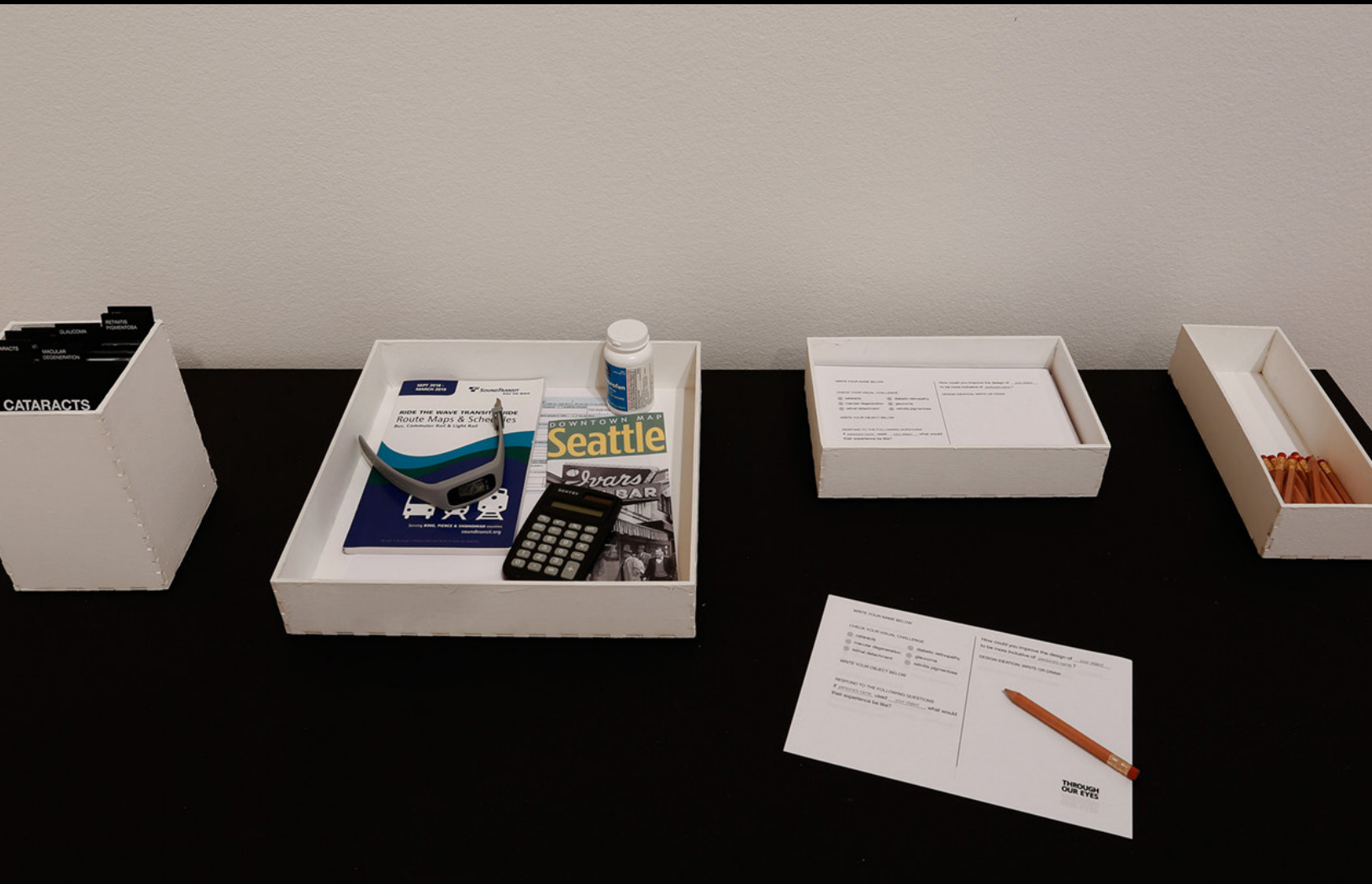
visitors can choose to participate in. I had three full sets of my activity cards for guests to look through. And then for the activity they would follow the instructions on the wall to pick a activity card and their corresponding simulator glasses and attempt to use a provided object with them on and record what their experience was like. They could then hang their activity sheet on the wall so they could look to see what other peoples experience was like. I thought this could be interesting way to collect data from visitors.

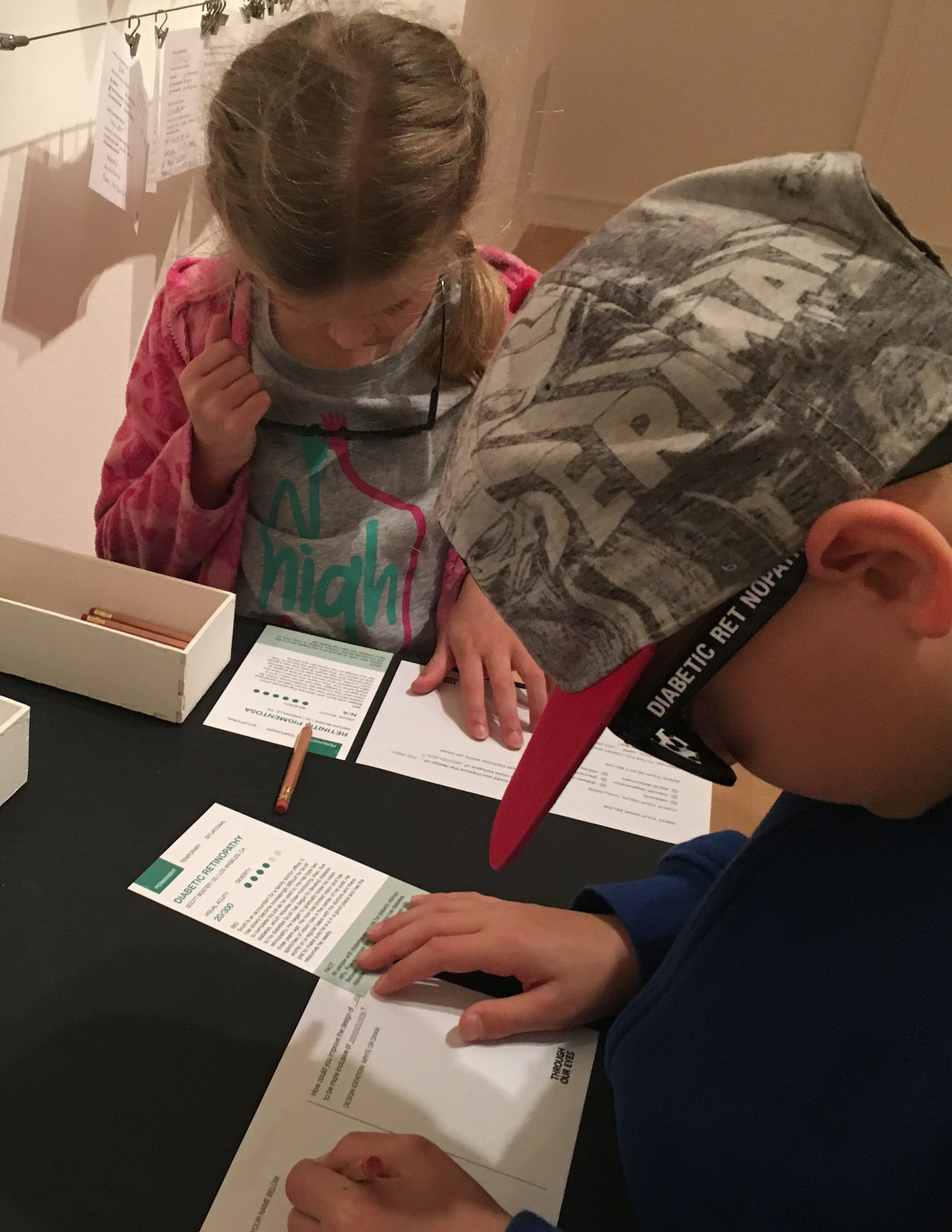

SEVERE IMPAIRMENT
MODERATE IMPAIRMENT
REAL VISION

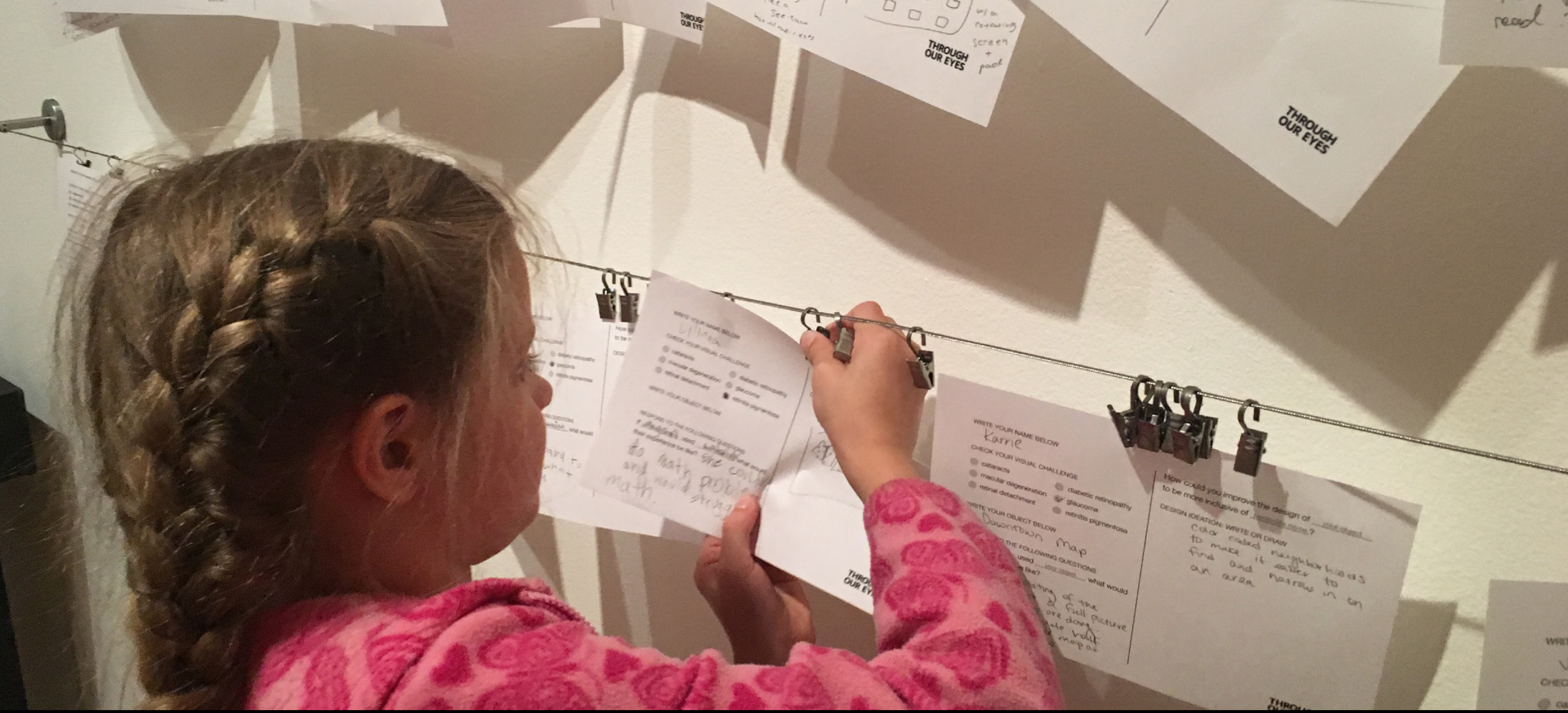

LOW VISION
REAL VISION

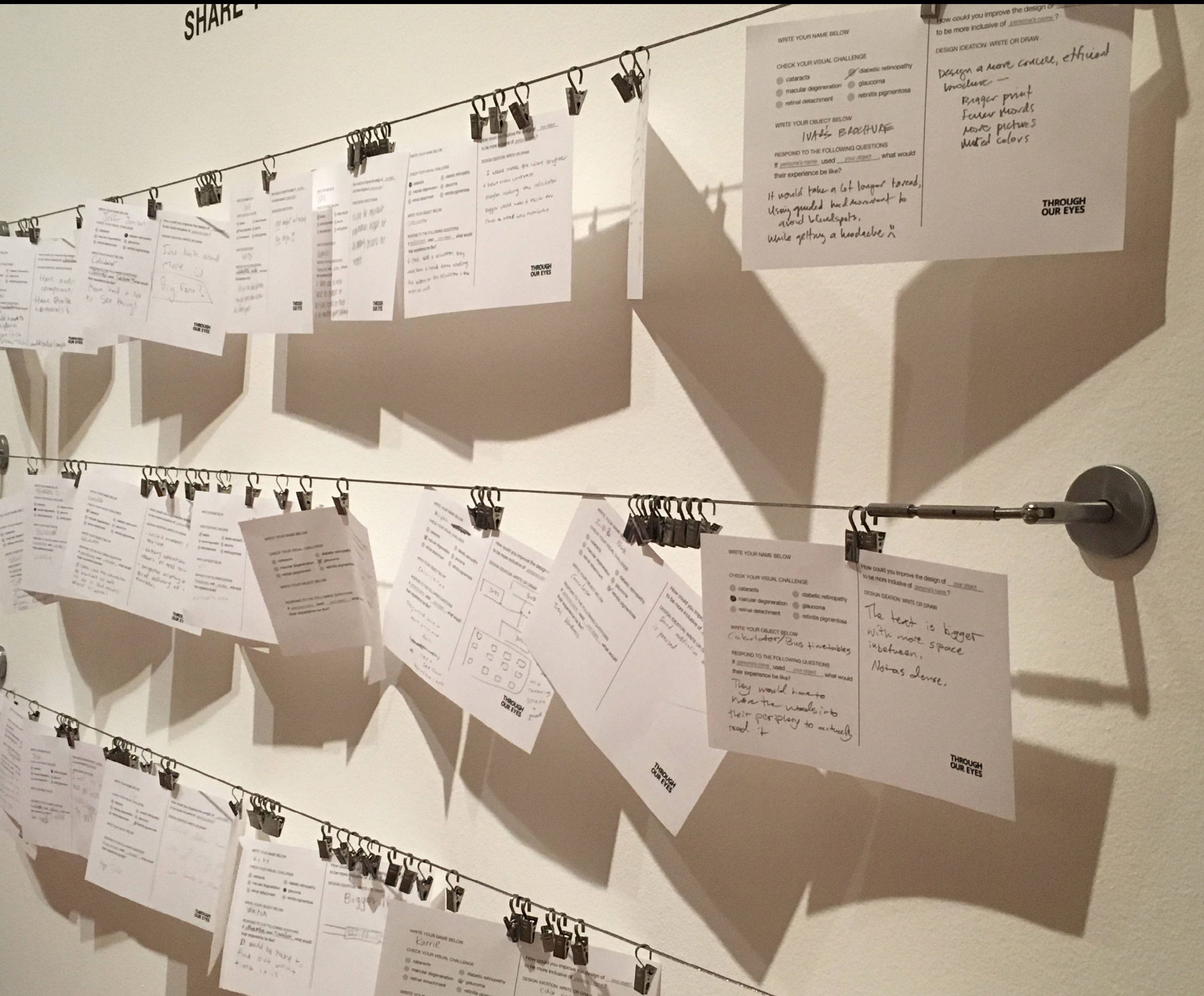

ROCK & ROL
68


1
CHOOSE A PERSONA CARD
2
PICK AN OBJECT
3
FIND THE MATCHING GLASSES FOR YOUR PERSONA
4
ATTEMPT TO USE THE OBJECT WITH THE GLASSES ON
5
FILL OUT AN ACTIVITY SHEET TO RECORD YOUR EXPERIENCE
6
HANG YOUR ACTIVITY SHEET ON THE WALL
Seattle


CATARACTS
RETINITIS PIGMENTOSA
GLAUCOMA
MACULAR DEGENERATION
RIDE THE WAVE TRANSIT GUIDE
Route Maps & Schedules
DOWNTOWN MAP
Seattle
Ivars
WRITE YOUR NAME BELOW
CHECK YOUR VISUAL CHALLENGE
WRITE YOUR OBJECT BELOW
RESPONDING TO THE FOLLOWING QUESTIONS
THROUGH OUR EYES


DIABETIC RETINOPATHY
20/300
THROUGH OUR EYES


THROUGH OUR EYES
WRITE YOUR NAME BELOW
Karrie
CHECK YOUR VISUAL CHALLENGE
cataracts
macular degeneration
retinal detachment
diabetic retinopathy
glaucoma
retinitis pigmentosa
WRITE YOUR OBJECT BELOW
Downtown Map
How could you improve the design of
DESIGN IDEATION: WRITE OR DRAW
Color coded neighborhoods to make it easier to find and narrow in on an area
THROUGH OUR EYES


WRITE YOUR NAME BELOW
CHECK YOUR VISUAL CHALLENGE
cataracts
macular degeneration
retinal detachment
diabetic retinopathy
glaucoma
retinitis pigmentosa
WRITE YOUR OBJECT BELOW
IVAN'S BROCHURE
RESPOND TO THE FOLLOWING QUESTIONS
If persona's name used your object, what would their experience be like?
It would take a lot longer to read, Using guided head movement to avoid blindspots, While getting a headache
How could you improve the design of
to be more inclusive of persona's name?
DESIGN IDEATION: WRITE OR DRAW
Design a more concise, efficient brochure —
Bigger print
fewer words
more pictures
muted colors
THROUGH OUR EYES
WRITE YOUR NAME BELOW
CHECK YOUR VISUAL CHALLENGE
WRITE YOUR OBJECT BELOW
Calculator/Bus timetables
RESPOND TO THE FOLLOWING QUESTIONS
They would have to move the words into their periphery to actually read it
DESIGN IDEATION: WRITE OR DRAW
The text is bigger with more space inbetween.
Not as dense.
THROUGH OUR EYES

REFLECTION

Throughout my experience at graduate school I have been able to make connections with professors, administration on campus, other design students who are interested in furthering inclusive design but not sure how to get started. There is a lack of education on the subject especially in the design circular. I truly enjoyed educated on the visual challenges through this project.

Inclusive design is overwhelming for a lot of designers who are afraid to do it wrong or were never taught they are not sure where to start so there continues to be a need for more designers who can contribute. Even as a visually impaired user, I struggled in some aspects of my project
to find good inclusive solutions.

One of the largest challenges I found in my project was no matter who your target audience is it is

important to understand who the user is going to be. For example, when I was trying to find participants for my walkthroughs, I had to be creative in my ways of finding visually impaired participants as posters or fliers which typically work is not a good solution for those who have impaired vision.

Another good example would be when I did my walkthroughs a large factor as to whether people could participate was being able to navigate to the building itself to participate. So I decided it was important to provide transportation as my participants are not capable of driving and navigating independently can be challenging and frustrating.

Inclusive design needs to start somewhere and educating designers about visual challenges is the first step which is why I chose to do this project. I hope that my activity cards can inspire designers to think about visual impairment differently and feel a little more educated on the topic to move one step closer to being inclusive.

MOVING FORWARD

After finishing graduate school I would like to move forward in working on the following and plan to continue to improve my activity cards and sharing them with other designers.

TOOLKIT

I would love to continue to build a toolkit for designer's which would be a style guide to help designers make their designs more inclusive and flexible for people of all visual abilities. The goal is to pair this toolkit with my activity cards and simulation glasses.

FUTURE WORK

I will be working for an architecture firm creating wayfinding systems and other graphical elements in newly built buildings mostly in downtown Seattle. I have already had the opportunity to start consulting with them to discuss how designs can be improved to work for people with a range of visual abilities.

CONCLUSION

This project reinforces the need for designers to be educated about visual challenges and inclusive design as a whole. If designers are better taught how to better understand individuals they will be more aware of how their designs can effect a group of people who are excluded often because of a physical condition. After designers have built compassion and empathy for those with disabilities they may find a whole new realm of possibilities and inspiration. I hope a continuing fight to better understand the disabled community will help remove or lessen some of the misunderstanding and misconceptions that are so apparent currently.

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