

## POVs and Experience Prototypes

### **Initial POV:**

We met Jordan Kortenhoven, a 24-year-old woman with autism and Nonverbal Learning Disorder. We were surprised to learn she has trouble making exact change and someone had once tricked her. It would be game-changing to help her make exact change.

### **Additional Needfinding Results:**

We conducted 9 interviews during the needfinding round, and after analyzing our results we concluded we had enough in-depth details to develop our POVs.

We realized Jordan's problem with handling money stems from her inability to understand numbers. At one point during the interview Jordan had trouble determining whether 40 was bigger than 20. To help us think about solutions that address the root of Jordan's problem, we broadened the scope of our initial POV, associating Jordan's money and time difficulties with her more fundamental challenge with calculations.

During our interview, Jordan also shared, "I can't figure out directions with 'left' and 'right.' I usually just look at objects to find my way." Another interviewee, Bob, a USC student with ADD, shared a different problem, revealing, "I can focus on things I'm really interested in, but sometimes that's not what's covered in lecture." Ultimately, to address a variety of needs, we developed 2 additional POVs.



## Revised POVs:

### POV #1

We met with Jordan Kortenhoven, a 24-year-old woman with autism and Nonverbal Learning Disorder. We were amazed to find that Jordan has difficulty making basic number calculations which affects telling time and calculating change. It would be game changing to make it easier for Jordan to make basic number calculations.

How might we...

- build Jordan a clock without numbers?
- make numbers more like pictures?
- make it easier for Jordan to pay?
- make basic calculations more like personal interactions?
- help Jordan understand how much time has passed?

### POV #2

We met with Jordan Kortenhoven, a 24-year-old woman with autism and Nonverbal Learning Disorder. We were surprised to learn she was good at finding her way around familiar places using landmarks despite her challenge with sense of direction. It would be game changing to formalize her landmarking techniques to help Jordan and others with a poor sense of direction travel independently in unfamiliar places.

How might we...

- get other people to help Jordan find her way around?

- create an alternative map system based on objects instead of streets?
- help Jordan find new landmarks to get around a new location?
- improve Jordan's sense of direction?
- make directions more like a TV show?

### *POV #3*

We met Bob Smith, a USC student with ADD. We were surprised to learn even though he had ADD, it was easy for him to focus on material he liked and learn more than what was presented in class. It would be game-changing to create something that allows the teacher to see how much more he is learning aside from what is necessary to pass the class.

How might we...

- show the professor all the extra work Bob is doing without taking up the professor's time?
- create a learning environment not solely based on testing and assignments?
- get Bob interested in things that he doesn't initially like?
- help teachers gauge, and therefore teach, what students are interested in?
- make course content more like a personal Facebook news feed?

### **Best "How Might We" Statements:**

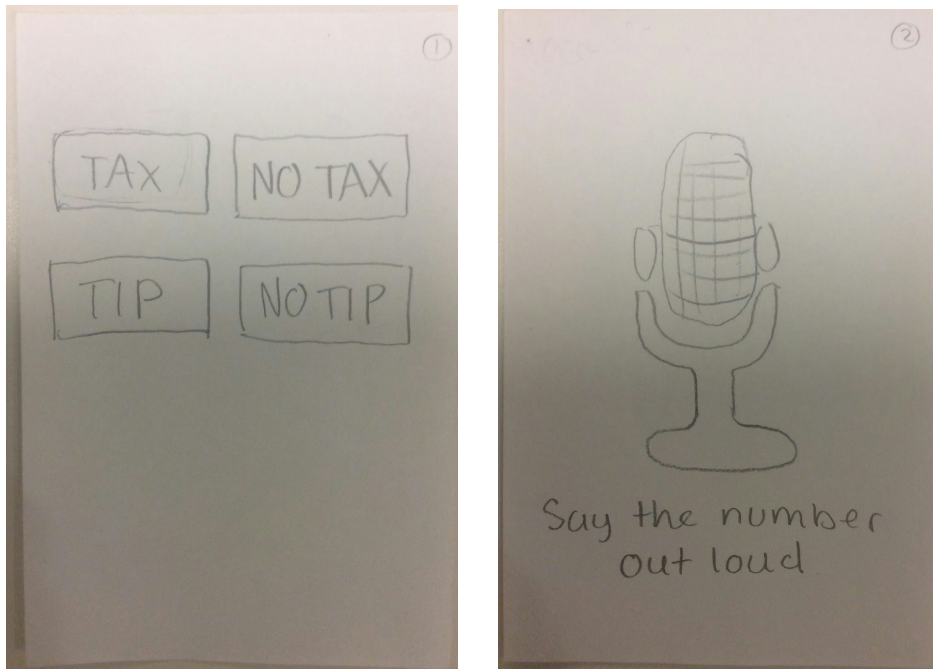
1. How might we make it easier for Jordan to pay? (from POV #1)
2. How might we help Jordan understand how much time has passed? (from POV #1)
3. How might we help teachers gauge, and therefore teach, what students are interested in? (from POV #3)



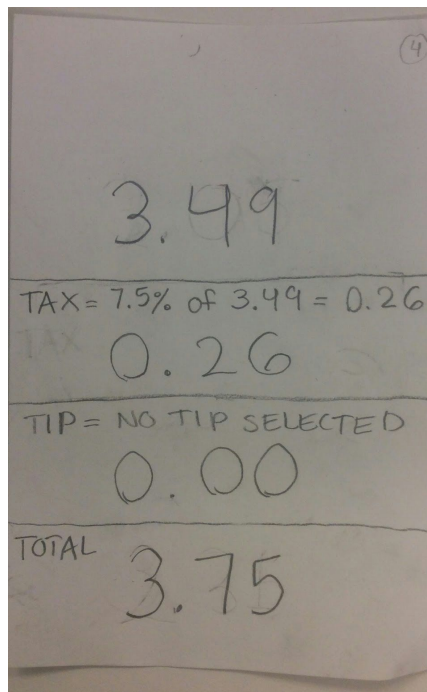
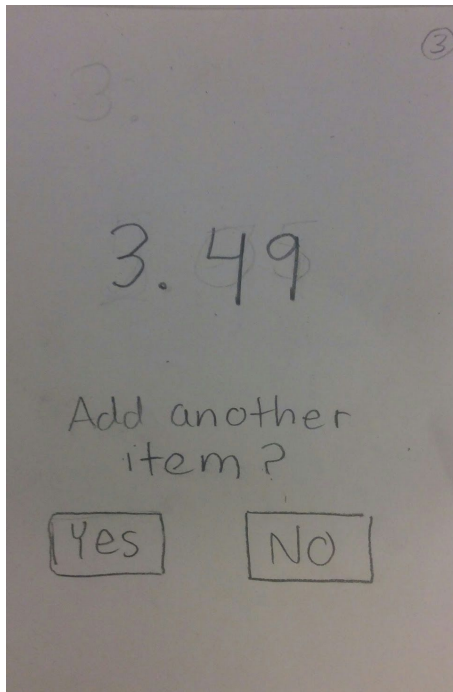
## Prototypes:

### *Prototype 1: an app to understand money visually*

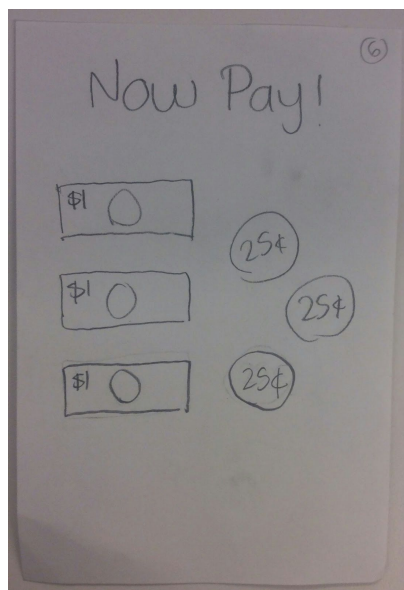
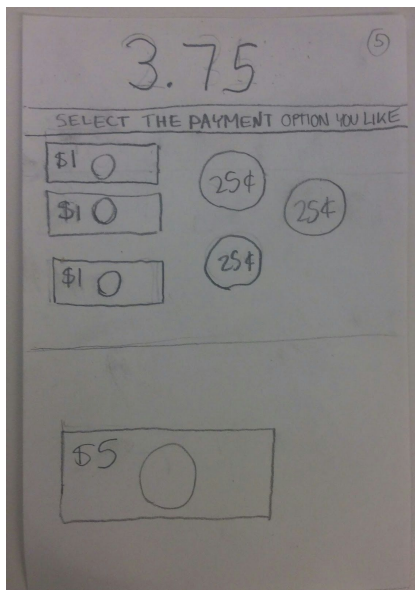
This app can help Jordan pay more easily by displaying the coins and bills she can use to pay. We made this prototype by drawing the different stages of the app on index cards that were approximately the size of a smartphone. The first screen allows the user to determine whether they want to add a tax and a tip to their purchase. The second screen prompts the user to say the item price.



The third screen allows the user to add another item, followed by a screen displaying tax and tip calculations.



A fifth screen displays different payment options. The user selects an option and receives a prompt to pay.



We tested this prototype by setting up a role play scenario for Jordan. We had Jordan pretend she was at a store buying a notebook. We assumed participants would be comfortable with this, but this assumption proved to be wrong when Jordan told us, "Pretending is hard for me."



We originally assumed Jordan's difficulty doing basic calculations also meant she had difficulty recognizing numbers, but this assumption was invalidated when we saw Jordan quickly read the notebook's price tag. Jordan read the price, and Lynne guided her through using the app to determine how she would pay.



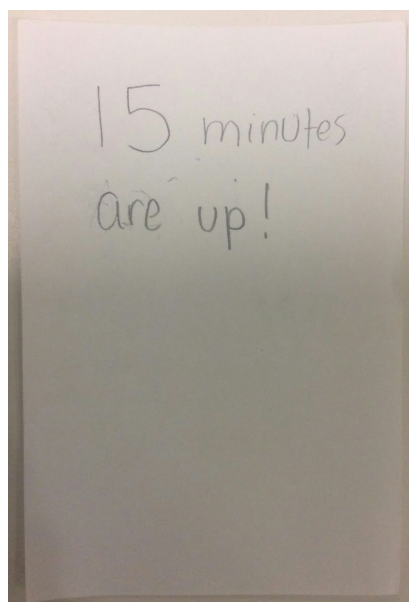
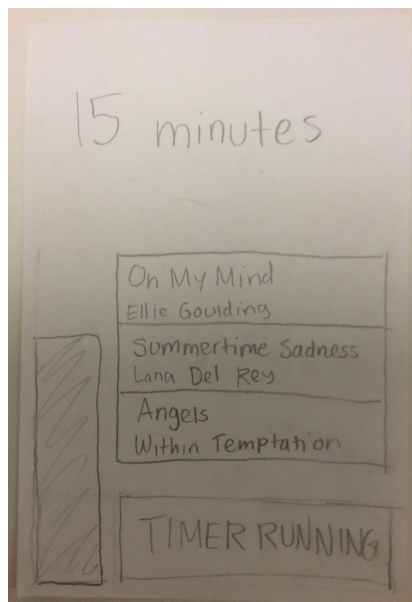
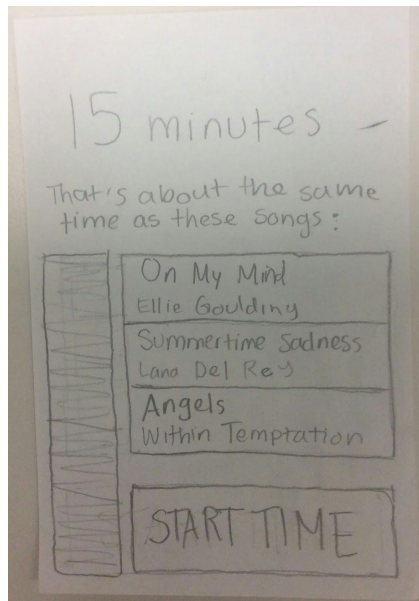
We found Jordan liked seeing the pictures of the money and the option to add a tip if she were at a restaurant.

However, there were some aspects of the prototype that did not work well. Since she previously mentioned she had difficulty typing on her iPhone, we initially assumed Jordan would enjoy using her voice to input the price, but in our test she told us that she would prefer typing it. Jordan was also confused by the appearance of a new number on the screen after the addition of tax, so we should clearly state this is a new total after tax. When Jordan got to the payment option screen, she was not sure what to do, so we should provide more explicit instructions (e.g. "Select the payment option you want to use. Scroll through to view other payment options."). Furthermore, Jordan's mom suggested we should add a budget to help Jordan know when she's hit her spending limit.

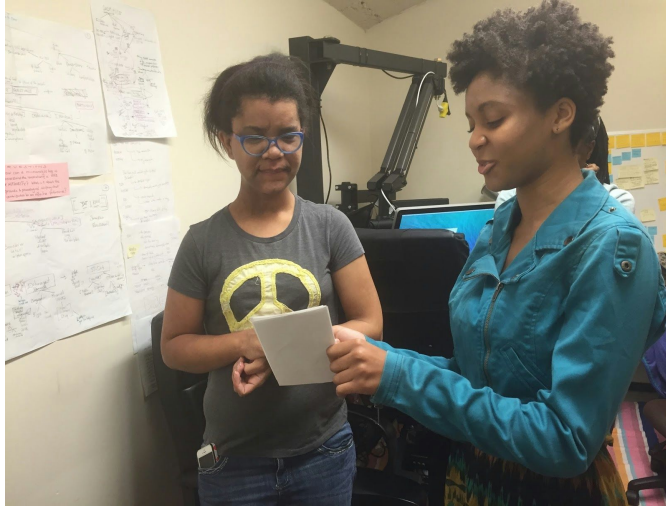
Jordan also requested a landscape mode. We formulated the new assumption that Jordan likes to use landscape mode because it provides larger keys, making it easier for her to type.

## Prototype 2: an app to represent time in alternate formats

This app can help Jordan track time, stay entertained, and develop her intuition about what different lengths of time feel like. We made the prototype by sketching the user interface elements on a set of index cards to mimic the look and feel of an app on Jordan's iPhone. The first screen prompts the user to say the time. The second presents the time visually as a vertical bar, as well as a series of songs from the user's device. The vertical bar shrinks and the songs play to show time passing, and the user is informed when the time is up.



To test the app, we had Jordan pretend to call her mom to pick her up from the movie theater, and Jordan's mom responded that she would be there in 15 minutes. We guided Jordan through the app, having her say "15 minutes" out loud and directing her to press "Start Time."



We discovered Jordan liked the straightforward UI, the ability to consume media while waiting, and the fact that the app could pull songs from her music library. Some aspects that did not work well were the lack of control over what songs were selected and the lack of an audible notification when the time ran out. We learned that Jordan would also appreciate having access to audiobooks.

As with Prototype 1, we assumed that Jordan would prefer giving inputs by voice, but this assumption proved to be wrong.



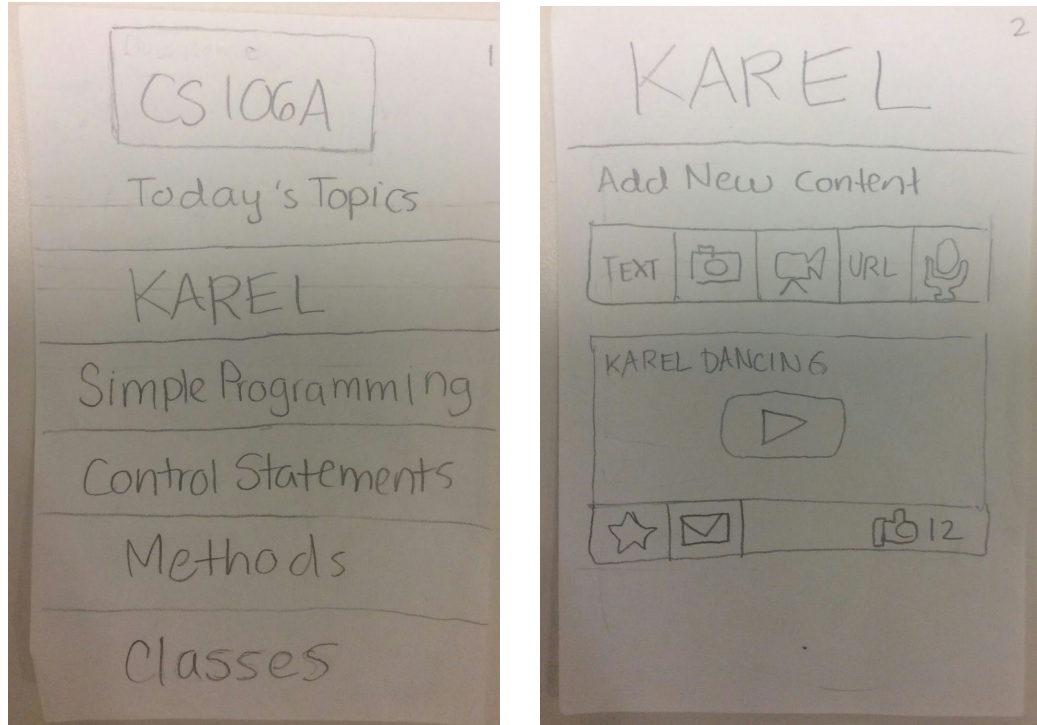
We also assumed that Jordan would always have access to Wi-Fi so that the app could also stream YouTube videos, but we learned that she would likely use the app outside of her home and in places without Wi-Fi.

Since Jordan had mentioned that she enjoyed music, movies and TV shows, we assumed that this media-based app would be a fun way for her to track time, and this assumption was correct. Jordan reacted with excitement at the prospect of using her music to track time, exclaiming, "Yes, I like that!"

### *Prototype 3: a forum for students to share content*

This app can help students like Bob, who cannot focus during class but do indepth research outside of class, to share what they learn with others, as well as help teachers identify material that engages students so it can be integrated into the lesson plan.

We made the prototype by drawing each phase of the app on an index card. The first screen shows the course syllabus, allowing users to select the topic they want to explore. The second screen gives the option to upload different types of content, in addition to displaying a newsfeed with material shared by other students.



To test the prototype, we had Stanford student Chris Middleton pretend he was studying for his CS106A midterm. We had him read his textbook and find a concept that was confusing him.

Chris then selected the concept on the prototype's topic menu, subsequently advancing to the next screen.



Chris really liked the overall flow of the app. He said the app would help him because he already researches course topics on his own, so it would be beneficial to have a forum in which to share what he learns with other students. Chris also liked seeing material presented in various ways and thought it would be especially helpful for students with different learning styles.

We assumed students would need an incentive to use this app, but this assumption was wrong. Chris said that he would use it without any incentive because it fits his existing study habits.

Chris mentioned he would like an option to filter material because certain types of content would distract him. Chris also pointed out that, for large classes, the newsfeed could become overwhelming. We initially assumed this app would work equally well for both small and large classes. However, Chris's feedback gives rise to a new assumption - that this app would be better suited for smaller classes.

**Most Successful Prototype:**

We found Prototype 2, the time app, to be the most successful not only because Jordan found it intuitive to use, but also because it was the only prototype to elicit a very animated emotional response, with Jordan exclaiming, “I like that!” The app effectively addressed Jordan’s need to understand the passing of time, while catering to her for passion for music and videos.