

## Milestone 5: Evaluate Working Title: Calmer

Concept: P Q Fokes

HCI 598 XE

Fall 2017

November 2017

Report begins on next page.

The demonstrations below are mockups of three tasks one can do in the application.

*Directions for viewing on your desktop:*

Read the description for #1, Using Tools, and open the first link.

There is one place on each screen that is linked to the next screen, and if you click anywhere on the page you will see a blue highlighted rectangle that is the link/"hotspot." If you click that link/hotspot, you will be taken to the next screen.

The links/hotspots are a bit rough, and cover a larger area that would be the "focus" area for tapping or swiping in the final application. Yet, this should be enough to give you sense of what is going on, or the path the application is taking you on.

Once you've completed #1, read the directions for #2, and follow the same process as for #1, then repeat for #3.

*Directions for viewing on your phone:*

*On the desktop screen above, there are several icons in the lower right corner below the phone screen. Click on the tiny phone icon to send the application to your phone, and follow the directions there.*

Three (pretend) tasks:

1. Using Tools-7 Examples: ((Pretend you suffer from PTSD or other anxiety issue, you've set up seven calming tools and you are reviewing them))

<https://invis.io/S5EW1F49A>

2. Shifting the order of tools: ((Pretend you've decided to move tool number 4 to the number 3 spot))

<https://invis.io/G5EW1EH9E>

<https://invis.io/G5EW1EH9E>

3. Building a tool: ((Pretend you're building a tool with an image, some text, and you're going to record audio))

<https://invis.io/8HEW1DG2S>

Quinne Fokes

M5: Evaluating Prototype (3 Tasks, and one section regarding understanding nomenclature for Menu Items)

**Working title:**

Calmer

**SUMMARY OF SYSTEM**

The users for this application are individuals with high anxiety, clinically determined or not, and have a set of tools they use to manage anxiety. These tools may take the form of experience with EMDR, DBT, CBT, meditation, mantras, images, sounds, writings that soothe, breathing exercises, pranayama, visualizations, self-talk, mindfulness practices, and more, which may be used in conjunction with medications and therapy. The app would be a toolkit, aggregating and storing references to or reminders to use some of the portable tools determined by the individual to be helpful in managing anxiety, and often related depression (Schmidt et al, 1998). Each user will be able to import and/or record, order his/her favorite tools, for use at a later time.

Being able to *quickly* access the various preferred tools by having them readily available could help with reinforcing their use as a training method. "...Extensive training of emergency procedures can make these a dominant habit, readily available to long-term memory when needed. Second, generic training of emergency stress management can focus both on guidelines, like inhibiting the tendency to respond immediately...and on techniques such as breathing control, to reduce the level of arousal to a more optimal value." Such stress training has been validated to have some degree of success and to transfer from one stressor to another (Johnston & Cannon-Bowers, 1996, and Driskell et al., 2001, as cited in Wickens, 2003, p 333).

The potential first audience of users are those with considerable experience managing anxiety disorders, usually over a number of years with a clinician. Because of the large number of women sufferers, the initial audience is women; those interviewed are in their 50s -60s and are considered the initial select audience in part because they have experienced many years of working with clinicians and have a breadth of tools at their disposal. They aren't digital natives, however they have become digitally fluent, or at least use mobile phones and desktop computers.

These women are likely to have the need to aggregate tools in order to have them easily accessible and portable when the user is away from the home environment where books, recordings, images and other tools reside.

By choosing to focus on a narrow age range, a specific and potentially underserved audience is addressed. Much more information, new medications, and techniques to address anxiety have become available since these women began their quest to find relief, however some techniques have stood the test of time, such as breath work. Additionally, designing for an older audience is likely to result in a system that is inclusive, as is discussed in accessibility circles.

As Jenn Simmons, host of the Web Ahead Podcast writes in the forward to *How to Meet the WCAG 2.0*, authored by Luke McGrath :

“If your team is made up of able-bodied 20-something developers who are under the illusion that they don’t know anyone with a disability, then you might fall into the trap of thinking web accessibility [and arguably applications on other devices as well] isn’t important...Nearly one in five people have a disability and many of those people have a disability that affects the way they use the web” (McGrath, 2017)

## EVALUATION METHODS

After the interviews were completed a spreadsheet was created with the questions asked during the tasks (1 and 2) and the questions asked in the email (task 3) at the top, and the participants names on the left so that answers could be compared. Comparison notes were made to the right of each column of answers. In most cases it was possible to generalize answers to provide the quantitative information in the Results section of this paper. Other findings and unexpected feedback are noted in the Results section of this paper.

During tasks one and two the participants were asked open ended questions and secondary questions as needed to prompt them to look again at the screen, without telling them what to do, but rather asking them what they would do or like to do next.

## APPROACH TO GATHERING USER DATA

The method used for gathering data was a combination of usability testing with the interviewer present in a remote location, and a semi structured interview, with note-taking on the part of the interviewer, followed by sending the participants a link for the third task section, with an email containing questions. These methods were chosen based on success with a previous experience while working with a team at an event sponsored by AdaptivePath.org, CapitalOne and other large corporations who came together to assist non-profits with problem solving using design thinking.

While a set of A/B tests or observation of participants figuring out where to tap to proceed to the next screen would be useful for evaluating the user interface itself, these methods are less well suited for this system, which offers more choice and the ability to tailor the system to suit the users’ needs than do other systems intended to help calm people.

The methods used for this application are intended to deliver the rich, qualitative data most likely to facilitate further iteration at this stage, and perhaps uncover additional use cases not previously considered.

There is more to learn about how people will use the system and their preferences, as they consider the process, for example, of building and editing a “Calmer Tool,” as well as how long specific tools would be useful to them. A listening session around a semi-structured interview tends to elicit underlying reactions and reasoning on the part of users, which will be helpful in moving forward with determining, for example, the number of tools to set as default, which kinds of tools might be more universally appealing, and what kinds of mental model users have regarding the concept of a library.

Gunay, Elif E [IM..., 12/15/2017 12:03 PM  
Comment [1] : Lets try to use academic resources

## **USERS: DEMOGRAPHICS AND BACKGROUNDS**

### **Anne**

— works for a non-profit community organization in an executive role, having retired from a position with a large utility company some years in the past.

She is 62, caucasian ,non-smoker, non-drinker, active, college educated, divorced with no children and lives with 3 cats. She has done therapy, participates in a 12-step program, has a spiritual practice and is actively involved in community service.

Anne is a PC user, fluent, and uses an android-type phone.

### **Carrie**

— an artist and professor living in Williamsburg, VA, with her husband of 3 years and cat.

She is well travelled, caucasian, a college graduate and has a master's degree as well; also a yoga instructor. She is 68, a non-smoker, light drinker, and very active. Both parents are deceased. Carrie was interviewed a year ago via phone, and interviewed again via phone six months ago. She has done therapy and has a spiritual practice.

Carrie is a MAC user with an iPhone; however she tends to get flustered, so if she can navigate this system with ease it would be would considered successful.

### **Amelia**

— an artist living in San Francisco, CA, with housemate. She is caucasian, not currently married and has a boyfriend.

She is well travelled, including living in France for a year or more, some college, is bright and well-read. She is 49, a non-smoker, light drinker, and very active. Her mother is living and her father is deceased. While not formally interviewed, in conversation Amelia indicated she has been managing depression and anxiety for years with therapy, medications, supplements and other tools such as DBT, and yoga, and exercise.

Amelia is a MAC user with an iPhone, and comfortable and competent navigating digital devices.

### **Bethany**

—not-for-profit development (fund-raising) professional, well-travelled mother of two adult children and is married. Bethany is caucasian, a singer, and lives with her family in San Rafael, CA.

Originally from Maine, 65, and a college graduate, Bethany is actively job hunting and tending to her family. She has been managing both anxiety and depression for many years with medications, therapy, exercise and other methods.

Bethany is a Mac user and has an iPhone. Of the six people interviewed Brenda seemed the most anxious while participating, most likely because of competing priorities and time pressure.

### **Gonzo**

— a contractor working in the solar (PV) industry managing large projects, and musician/sound engineer living in San Anselmo, CA, with housemate and cat. Currently Gonzo works on projects for months at a time, staying on site or in hotels near the solar power plant construction sites.

He is caucasian, well travelled, has completed most of an Associate's Degree and is very active in his work. Both parents are living, and he is not married and has a girlfriend. He has been dealing with anxiety, depression and ADD for most of his life, and has had some therapy, participates in a 12-step program.

He is both a PC and a MAC user, currently carries an iPhone, and often has a second phone either iPhone or Blackberry or Android for work.

### **Chad**

— a retired corporate trainer currently engaged in developing a business, and working part time stocking specialty items for a company servicing Safeway stores. He is 68, born in San Jose, CA, college-educated, an active cyclist, with a large dog, wife and adult son. He and his wife recently began attending Alanon because of their son's issues, and Chad has an active spiritual practice and has done therapy as well.

He is caucasian, and while he doesn't suffer from an anxiety or depressive disorder per se, he is extremely sensitive and empathic, and perhaps suffers from ADD. He is a PC user and has an iPhone.

All three of these participants are extremely sensitive individuals.

## **SPECIFIC TASKS FOR USERS**

For **Task One, Using Tools**, and **Task Two, part 2, Changing the Order of the Tools** the users were asked to view the iPhone screens remotely on their desktop or laptop computers and describe to the interviewer what they were seeing, what they might want to accomplish, and/or what they believe will happen if a specific area was tapped or swiped. For **Task Two, part 1**, users were asked to review a drop down menu of options and give their best prediction as to what those choices might indicate.

For **Task Three, Building/Adding a Tool**, the participants were sent a link and asked to step through the screens by themselves while looking at the screens in a browser, then report back via email what areas were confusing, and any questions they might have. It was hypothesized that after going through the first two sections with the interviewer, they would have enough of an understanding of the application's purpose to review the third set of screens at their convenience, without an interviewer. All of the users were busy, and this was done to make it more convenient for them to go through the third section on their own.

## **INTERVIEW QUESTIONS**

After a brief introduction about the application's purpose and what to expect, i.e. two sections to review with interviewer (me), and a third on their own, questions were posed to each participant as described below.

### **Task One, Using Tools Task:**

The questions were all open ended, and somewhat dependent upon what they did or did not see, expected or did not expect.

*For example*, if the participant did not comment on the audio cue in lower right hand corner for the first screen, then the next question might be:

- What do you think this means ? (while interviewer points to audio cue) or
- Do you think there is audio? (while interviewer does not point to anything).

The participants were questioned about each tool they reviewed, how to get to the next tool, whether or not there was audio, and what might they want to do next.

*For example:*

- Here you are on your first tool, what do you see?
- Do you see anything else?
- What might you want to do next?
- What else do you see that might give a clue?
- Do you think there will be audio?
- What do you think is going to happen here?
- What would you do next?
- What might happen if you clicked on the green rectangle?

### **Task Two, part 1, Meaning of Menu Items Under Options**

In **Task Two**, there were two types of questions. In **part 1**, each menu choice below Options was read out loud by the interviewer, and the participant was asked what they thought it might mean or allow them to do.

*For example:*

- Where it says **add tool (later changed to build tool)** what might happen here?
- Where it says **change order**, what might happen here?
- Where it says **edit a tool...**?
- What do you think **update library** might mean?
- Preferences- (this was verbally altered after the first participant, to a choice of **settings or preferences**) what might this be about?

### **Task Two, part 2, Change Order Task**

The next question was asked while stepping participants through the **Change Order** task, with the goal of determining how familiar users in this age group (49-70) were with the drag and drop interface using a finger swipe. There is a hint in the form of a finger on the highlighted area to be moved, and the question is:

- How would you move tool #4 to the #3 position.

Next, participants were asked whether, when the application first opens, s/he would prefer to have a large number of tools appear to be swiped through, or whether they would prefer to have a list to appear from which to choose a tool. The next question was how many tools would you like to see before seeing the list.

Lastly, participants were asked whether they had any questions or comments to offer.

### **Task Three, Adding/Building a Tool Review Task**

For this section participants were sent an email with a link to screens for Adding/Building a tool, asking them to step through the screens on their own, and then answer the following questions:

- Did you like the system? Feel free to elaborate! [If you don't like it— that is helpful information! especially if you let me know why.]
- What parts were confusing?
- Do you have suggestions for improvement?
- If the system worked well, how much would you pay to buy it and use it? (\$10, \$5, \$2, \$1, \$0 (free))

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**Comment [2]**: I was wondering if you asked them if they want to use Calmer when they have panic attack

## TESTING ENVIRONMENT

In order to receive feedback on the first two tasks, usability testing took place with the interviewer on the phone, interacting with the participant on-screen from a remote location. The user was sent an invitation with a link to **Task One, Using Tools**, and a second email with a link to **Task 2 Two, Changing Order**.

The user viewed on screen mockups created in Sketch, presented through a browser window using InVision. The interviewer both asked questions and took notes; one of the sessions was recorded using Zoom.

The users were located in their homes, home office, and in one case seated next to me using a separate computer.

For the **Task Three**, a link to a browser containing a sequence of screens was sent to the participants along with a few questions to answer at the end of their review session. These were emailed back to the interviewer (me) upon completion..

## RESULTS

### Task One, Using Tool Task:

Four of six participants recognized the audio graphic as a means to turn audio on, two were not sure whether it was volume or audio. All six understood the left arrow on image was for advancing to the next screen.

Two of the six needed prompting before they realized there was a scroll bar in one tool; one commented s/he wasn't sure how far down it went.

Three participants seemed less engaged while viewing the tool without sound; three seemed ok with reading it to themselves or out loud, and appeared to understand the benefits of reading words silently or speaking them out loud as a means to become less anxious.

Five participants became animated when they saw the screen with Tibetan Singing Bowls, although none realized immediately it was a video clip; one recognized the screen featured a video after looking at the screen for a few seconds.

All six seemed enthusiastic about seeing an animal as a part of one of the tools.

**Task Two, part 1, Meaning of Menu Items Under Options:**

**Add Tool/Build Tool**

The phrase Add Tool was understood by one participant to indicate adding to tools currently in use from a collection of already built tools, while four understood it as adding from a collection of parts; one of those participants also understood it as adding from a collection of completed tools.

**Change Order**

All six understood the meaning of Change Order.

**Edit Tool**

“Edit Tool” was understood by six participants as making a change to a tool, however upon further reflection one participant seemed confused by the difference between updating a tool and updating the library.

**Update Library**

There was less clarity and some interesting ideas for implementation regarding the menu item Update Library. The mental models included: a place to move older tools, a set of tools not in active use, use to update audio, location for tools not yet uploaded, location for tools for future use, a location for tools the company might add, and a place to find items there wasn't time to review previously.

**Preferences**

The greatest area of confusion was with the item Preferences, so much so that part way through the interviews it was changed to Settings or Preferences. One participant thought it meant preferred order, one indicated a need to see the Preferences in order to understand what was included there, one thought it would indicate which tools were used the most— as in “preferred.” Once the word *settings* was incorporated the next participants identified it as a place to set volume, or tone, or order, time of day, or to set something — as in application wide settings.

**Task Two, part 2, Change Order Task:**

All six participants understood the drag and drop aspect of the interface.

**Task Three, Add Tool/Build Tool:**

This section was done by the participants separately, after the other two sections, and without the interviewer present. Participants responded by email with any questions they had regarding what was confusing to them. One participant was not clear as to what “Position” meant, in the area where you enter what position (appearance order when using the tools) you want the tool to appear in. Otherwise, the participants indicated they understood what this task entailed.

“ Okay I just realized that each iteration is slightly different stage of adding the tool. So now I understand. Looks very good to me.” — Carrie

**Question/Comments from Participants:**



Once participants had reviewed the using the tools and changing order sections they were asked whether they would prefer to have their tools come up one after another, or choose from a list. Upon reflection, all six wanted at least one tool to come up in case of [anxiety/panic] emergency before being given a list of tool choices. One wanted two, four wanted 2 tools before the list, and one participant said he would like to see the list first.

Some comments are below:

“ We’re in a world of crazy choices and that [seeing specific tool] would help focus. I think it’s a great tool...Just as it is it has merit.” — Bethany

“ It’s becoming an effective idea. Love visual, auditory, list. I like it that it is fairly simple, not a whole lot of bells and whistles--cause maybe that would be overwhelming when I’m in that [anxiety] mode. Not too many options not too many lists. — Carrie

“ Is there a way to delete a tool if it no longer works for you? [Note this] Say- right now I don’t want that mantra any more. I don’t want a list that is 50 long.” — Carrie

“ I do not have any suggestions. I think it works well. I would be willing to buy it after a FREE TRIAL... I thoroughly liked the visual aspect of the system. The name "Calmer" connotes perfectly what 's it's about. Maybe one day a different front screen of beginning screen, but for now it's simple, straight forward and calm! Eventually word of mouth ---especially from counselors will sell the app.. Maybe free to counselors?? Or find a group of super anxiety ridden people and give it to them for free in exchange for them to promote it on social media. I would pay \$4.99 to download it if my counselor /therapist recommended it and I'd never heard of it. ( and I would now pay \$4.99 even without a therapist's recommendation. ) — Carrie

“ ...after the "good job part: again this is good .. with reinforcement of what the person is doing.” — Carrie

“ I think it is a fun tool- laid out well, I like the various options--music, voices. If I could change the image on the Mantra- that one didn’t really do it for me. I might like the option of...I want the Buddha. Could I select from my library? Could I add another mantra? Could I add Deva Premal’s music to the library? -- Instead of listening to After Midnight. She has tons of beautiful music that is very calming and beautiful to embrace. [I] like that I can personalize it.” — Chad

“ I like the application- it’s pretty cool. One tool and then a list- I don’t ;like having to click through things To select what I want as quickly as possible- after the first thing --if I have a really good thing as the first one. Or maybe I want the list--there are all kinds of situations--maybe I want to hear music sometimes and maybe see words cause I’m in a meeting- stuff like that. Put things that I can easily access- little pieces of paper I have around are ot easily accessible. I’d like to take a picture and insert it as one of the options. What do you think about having a library where you can upload those pictures Good- I could have more that are in the application that are using right now. Could change them out. It’s really neat. — Anne

“ I LIKED IT A LOT!!! No Suggestions other then clarify ... what position #1 is ~ \* If the system worked well, how much would you pay to buy it and use it? (\$10, \$5, \$2, \$1, \$0 (free)) \$5” — Amelia

## CONCLUSIONS BASED ON DATA/WHAT DOES DATA MEAN?

### *Using Tools Section*

#### **Audio, Video, Advance**

Based on the participants feedback, *in the using tools section*, audio, video, advancing are sufficiently cued; scrolling was less well understood, needs to extend to bottom of screen and its contrast with background should be increased. This is a visual perception concern.

*Solution:* Increase contrast and allow scroll bar to extend to bottom of screen. Done.

#### **Music tools need an Image**

Tools with music only and no image would be better understood if the system provided a more clear indication the media is music. One participant thought the application was broken upon not seeing an image. Cognitive concern.

*Solution:* Add pale green where image would appear with musical note on it. Done.

May be useful to include a message reminding the user that repeating the audio is an option.

#### **Sound**

Half of the participants seemed less engaged without sound; two seemed ok with reading the mantra to themselves or out loud and seemed to understand there is benefit to reading words silently or speaking them out loud. Cognitive issue whereby increasing engagement by using sound is likely to be helpful to many, whereas others might be better served by reading the words out loud or silently. How much of this has to do with novelty of seeing a new application and the desire to have as many options as possible vs the participant's ability to clearly imagine how they might feel in the scenario proposed is hypothesized by the interviewer, below.

Regarding the use of sound and images:

*Solution:* No solution required; users can add images and sound where they choose to do so.

#### **Elaborating on Use of Sound, Image**

The two participants who were interviewed in an earlier milestone (Carrie and Anne) seem to have a better understanding of how/why the application would function best for them, as well as how to use it to best advantage, for example when sound would be helpful and when it would not. One participant (Chad), who is less prone to anxiety in general, and has a strong spiritual practice noted:

“ I might allow myself to absorb the words, and repeat again. I like to read things out loud because it does lend a depth to what I am doing, my spiritual training.”— Chad

**Examples of three participants imagining additional uses for tools, new use cases and new tools:**

Because one participant (Chad) seemed able to imagine use cases for himself and others in stressful situations, even though he himself did not suffer from an anxiety disorder, per se. His feedback, and that of the two participants who were interviewed at the beginning of the project (Anne and Carrie) provided feedback that was the most useful for determining next steps for further work on this application.

Upon seeing the tool incorporating cat without text, but with sound, one participant made the following comment suggesting how the application would be useful to a non-anxiety prone person who has had a stressful day:

“...favorite animal. That would make perfect sense if you were at work and stressed out, to see a picture of my beautiful cat, in her winter coat, with her toy, I might dwell on that for a while.....a dog would have a calming effect and I'd laugh, I'd feel pretty good and remind myself that when I get done with work I can go home to my dog. I want to see what the next tool is.” — Chad

In another example, for imagining a new use case, after considering the Preferences/Settings menu option, one participant (Anne) suggested having the application automatically turn on at a pre-determined time of day:

“ Might be an option to move automatically from one screen to the next, or maybe there is a certain time of day I want it to go on and start running...” — Barbara Anne

In a third example, when considering what the Add Tool section might allow her to do, one participant (Carrie) imagined incorporating a mandala, a different tool from those provided; she clearly understood each page was a tool to be used as needed:

“ Add other tools- maybe you have a collection you can choose from so you can customize it to you. Incorporate another way of calming down. Maybe I want to look at a mandala. Add another page. I'm looking at each page as a tool.” — Carrie

**Video**

The video clip wasn't immediately recognized as a video, although all of the participants said they would have clicked the arrow at lower left to see what it was. They were, however, animated when they saw the Tibetan Singling Bowls image itself. In general the ability to incorporate video was well received by participants:

*Solution:* Add typical arrow icon on top of video still.

“ Especially these days, a video is great.” — Carrie

***Task Two, part 1, Meaning for Menu Choices Under Options***

*In the Section Two part 1*, users were asked to guess what task each item under the options menu indicated.

**Under Options: Understanding Meaning of Add Tool**

Users were not in universal agreement as to what “Add Tool” might mean.

*Solution:* change *Add* to *Build* a tool, which more clearly describes the activity.

### **Under Options: Understanding Meaning of Change Order**

The next item in the menu, “Change Order” was understood by all six as meaning to put the tools in a different order.

### **Under Options: Understanding Meaning of Edit Tool**

“Edit Tool” was understood by six participants as making a change to a tool, however upon further reflection one participant seemed confused by the difference between updating a tool and updating the library.

### **Under Options: Understanding the Meaning of Add/Build Tool**

The participants indicated that add tool meant the application would show you already built tools to add for viewing, therefore in subsequent interviews the participants we told the Build Tool might be more accurate.

Because the phrase Add Tool was understood by one participant to indicate adding to current use from a collection of already built tools, while four understood it as adding from a collection of parts, (and one of those also understood it as adding from a collection of completed tools) it seemed wise to change the phrase to Build Tool.

One participant though it would mean:

“ If you pick tools it will show you tools.”— Brenda

Clearly the nomenclature needs a fix for this section, although once in that section participants where were walked through how to build and number a tool they were not confused by the process.

### **Under Options: Understanding the Meaning of Preferences/Settings**

Because there was a range of interpretations as to what this may mean, and because there was some confusion about the word preferences itself, this term changes to settings. Change Order, which was clearly understood, may be better located under Settings rather than as a separate entity, especially given the feedback that users may not want a large number of tools to appear automatically, but rather only one or two before being shown a list of tool options.

### **Section Two, part 2, Change Order Task**

Change Order was also one of the three tasks completed (or user directed the interviewer to do this task). Participants understood how the drag and drop interface worked to re-order the tools.

*Note:* In the Add (Build a) Tool section, however, the word *position* when used to enter the numerical order of the tool being built was misunderstood by one participant.

*Solution:* use the word *order* or *numerical order* or *order of appearance* across all parts of the application.

### **Section Three, Build/Add Tool**

In the Build Tool (formerly Add Tool) task one participant was not clear as to what was meant by “Position,” the option for choosing the order in which tools would appear. Otherwise this task section seems to be clear to the participants.

The image was kept in one place throughout the building period. The order in which adding tool the components was consistent with how the tool appears once built, viewed top to bottom, i.e., image first, title second, text third, audio fourth, appeared easily understood by the participants. Given this was the third task section evaluated, participants were more familiar with the application and therefore more likely to know what to expect.

## SURPRISES

While the hypothesis was that users would want many tools to tap through one at a time and most wanted one or two tools to come up before being shown a list of tools from which they could *choose* the next tool, while one wanted to see the list *first*.

Additionally, it occurred to the designer (me) that the system would be useful for supporting other kinds of therapy, for example physical therapy. It's sometimes challenging to remember to do PT exercises, and tools in the form of picture, text and audio for each exercise, in the appropriate sequence would be helpful in keeping patients on track with his/her program.

Likewise the system could be used to support practicing new (better) habits in place of older, destructive ones. The goal could be shown as an image and support provided as text and audio. For either of these uses, of course the system would require a different name, although the system itself would be the same.

## PRIMARY IMPLICATIONS FOR DESIGN

Overall the concept continues to be workable and useful.

One change that needs to be made immediately is the height of the screens. Because at this time the iPhone 6 is the most popular model, that size was chosen. However, the wireframes are too tall because they included the bottom section with the back arrows. The wireframes need to be modified to accommodate the existing lower section on an iPhone (including back arrows, book marks, etc.) *Level 4 cosmetic problem, easily repaired.*

Change the word *add* to *build* in the Add Tool section, which becomes Build Tool. *(Level 2 major problem, easily repaired)*

This section works well and was well received; suggesting to keep as is other than visual design. The location of the image at top and text in middle, with audio option at bottom seems understandable to users, and reinforces how tools are built, in the same order each time going from top to bottom of screen. Having the image present and partially obscured seemed well understood and mirrors the final layout of the parts that make up the whole for each tool.

### Key for level of problems encountered:

1. Usability Disaster; must fix
2. Major problem
3. Minor problem
4. Cosmetic problem (more related to prototype itself than system)
5. New feature request

Gunay, Elif E [IM..., 12/15/2017 12:55 PM

Comment [3] : Great idea!

Gunay, Elif E [IMSE] 12/14/2017 3:50 PM

Comment [4] : I see you separately write the levels of the problem however could you please categorize design problems based on usability disaster, major problem, minor problem,....

In your final presentation you may show the design problems under this categorization. It may help your committee members easily to understand the pain points.

Determine how the Library will function. Feedback suggests sectioning it into: tools not currently on “the list,” image parts, video parts, text parts, and audio parts. The word components, while accurately describing the “parts” of tools may put too much emphasis on the technology aspect and not enough of the human solution factor, and should be avoided if possible, with another word used in its place. *Not really a problem, but an enhancement based on features now clarified by user input.*

Consider whether adding to the library is easily accomplished on the phone so that a *different* interface is not required for desktop use, but rather a slightly modified version of the phone interface. If this is not possible, then design a desktop interface for uploading to the library, and keep this –if possible - as the only significant difference between mobile and desktop versions. *Not really a problem, but an enhancement with features now clarified by user input.*

Add an explanation of what the application is about and how to use, similar to what participants were told in the interviews/usability studies. *Level 3 minor problem, easily repaired.*

*Other changes would be useful:*

- Change the clickable information symbol and message at the end of the building tool section to a modal dialog. *Level 3 minor problem, easily repaired.* Add additional positive reinforcement throughout the application via modal dialog. *Level 3 minor problem, easily repaired.* In the settings section, allow all tips, information, positive feedback dialogs to be turned off, as this may become annoying once users are familiar with how to use build a tool. *Level 3 minor problem, easily repaired.*
- Change application to show two tools sequentially, automatically when application is launched, followed by a list of tools from which users may choose. *Level 3 minor problem, adds more complexity to design-in order to make this user friendly.*
- When the participant has completed using a tool, add modal dialog asking whether to repeat, or show list of tools. *Level 3 minor problem, adds more complexity to design-in order to make this user friendly.*
- Change Preferences to the word Settings, and include Change Order under Settings. *Level 3 minor problem, easily repaired.*
- Always include a color block/music image when music is chosen as a tool with no image. *Level 2 major problem, easily repaired.*

## REFLECTIONS ON PROTOTYPE AND EVALUATION PROCESS

The prototyping for Calmer was done using Sketch 4.7.1, and InVision. I chose these because they are most frequently used by colleagues. InVision was new to me and now better understand its interface.

InVision allows you to send a link to a participant, and have them click through screens on a desktop *OR* through interacting with the screens by touching “hotspots,” which will show up as blue

Gunay, Elif E [IM..., 12/15/2017 12:57 PM  
Comment [5]: I would be great if you are able to do it until your final defense

Gunay, Elif E [IMSE] 12/14/2017 3:57 PM  
Comment [6]: I also remember that you were going to delete the “position” heading under “building a tool task(task 3)”. You may also include that here.

rectangles when the user touches anywhere on the screen. In other words, by tapping or clicking on the screen, the user gets a hint as to which locations are “live.” (Unfortunately, this was not made clear by the tutorials.)

Going forward, it seems wise to proceed using the method with hotspots, and prepare the participants in advance by letting them know to look for the blue rectangles which represent the “hotspots.”

A cognitive walkthrough method of research, previously practiced with colleagues, and the participant was asked to talk through her/his experience, and move to the next screen after stating her/his expectation of what would come next in the task.

This method has advantages in that the interviewer hears the thinking, reactions, and reasoning of the participants and is thereby able to note any overarching themes. This method provides a very rich set of qualitative data, which can then be sorted and combed through to reveal patterns, understandings, and further quantified by comparing each participant’s responses to those of the other participants.

Comparisons and quantitative analysis was accomplished using a spreadsheet listing each participant’s responses to the questions. The study may be repeated using the same questions after design changes listed in Implications section are made; the new responses could be evaluated in comparison to the answers from this first study and further iterations planned.

One aspect of evaluating that was particularly helpful was going through the process of assigning a level of severity to each problem. Even though it is a somewhat subjective process, it helps with the planning of next steps by providing data to use in determining priorities and timing. Pausing to set priorities is key to successful project management and allocation of resources.

## REFERENCES

Wickens, C.D., Lee, J.D., Liu, Y., Gordon Becker, S.E. (2004). *An Introduction to Human Factors Engineering, Second Edition*, p 50, p 146, p 149. p 407. New Jersey, Pearson Prentice Hall.

From Wickens et al above: Carroll, J. S. (1994). The organizational context for decision making in high-hazard industries. *Proceedings of the 38<sup>th</sup> Annual Meeting of the Human Factors & Ergonomics Society* (pp. 922-925). Santa Monica, CA:HFES.

Johnston, J.A., & Cannon-Bowers, J.A. (1996) Training for stress exposure. In J.E. Driskall & E. Salas (eds.) *Stress and human performance*. Mahwah, NJ: Erlbaum

McGrath, L. (2016), *How to Meet the Web Content Accessibility Guidelines 2.0: Second Edition*. PDF version, Luke McGrath.

Schmidt, N.B., Lerew, RD.R., Joiner, T.E. (1998)— Anxiety sensitivity and the pathogenesis of anxiety and depression: evidence for symptom specificity. *Behavior Research and Therapy*, 36, 165-177..

EVALUATION

CRITERIA	POINTS	
Brief summary of the system, its users, and the tasks it will support. (Feel free to re-use content from before.)	2	OK
Evaluation Methods Your approach to gathering user data, and why you chose that approach over another one Your users (demographics, background, etc) - work with at least 6 users Your specific tasks for users Your interview questions or questionnaire Your testing environment (At a bookstore café? At the user's home?)	5	
Results: Present your data (qualitative and quantitative, as appropriate) No need to discuss the data here; that's the next section Be sure to include how many users, some data from each user For qualitative data, give quotes and a summary of any overarching themes For quantitative data, give raw data from surveys since stats like average don't make sense with a small sample size, e.g. "3 of 6 users said..." or a chart showing a bar for each of 6 users with their ratings.	5	
Discussion What do you conclude based on your data? What do the data mean? Was anything surprising? What are the main implications for your design? Reflect on the prototype itself and your evaluation process: was this a useful process for refining your system, e.g. would you repeat it for future system design projects?	3	
TOTAL	15-2=13	Please see my comments -2 points for being late