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ARTDES 499: Integrative Project

Written Thesis

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Introduction

As a student, I have observed my friends and peers in the midst of a mental health crisis. We are academically stressed, socially anxious, and need help keeping our respective cools as our lives continue to change. As access to data processing grows, many people have started using self-tracking to identify negative forces and find new opportunities in life.

The Quantified Self community (quantifiedself.com) is an example of the growing self-tracking movement. Members of this community track things like personal development, comfort, micro-aggressions, mood, knowledge, first experiences, mindfulness, gratitude, reliability, productivity, satisfaction, curiosity, and love.¹ These people overcome accessibility barriers to self-tracking by hacking existing technology like google sheets, or building their own tracking apps.² They are motivated to improve their health, performance, and to find new life experiences.³ Pitfalls that they experience include tracking too many things or not tracking the right triggers and/or context.⁴ Although the Quantified Self process is heavily involved in data collection, the ultimate goal is to reflect on that data, extract insights, and make changes.⁵ This makes it very important for interfaces to support self-reflection once data collection has happened so that behavior can be realized and improvements can be made.

I want to focus on this reflective stage of self-tracking, and create a visualization interface that lets users think about their data and make healthy behavioral changes. Unfortunately, doing this isn't as

¹ "Show & Tell Projects Archive - Quantified Self." Accessed April 22, 2020. <https://quantifiedself.com/show-and-tell/>.

² Choe, Eun Kyoung, Nicole B. Lee, Bongshin Lee, Wanda Pratt, and Julie A. Kientz. "Understanding Quantified-Selfers' Practices in Collecting and Exploring Personal Data." In Proceedings of the 32nd Annual ACM Conference on Human Factors in Computing Systems - CHI '14, 1143–52. Toronto, Ontario, Canada: ACM Press, 2014. <https://doi.org/10.1145/2556288.2557372>.

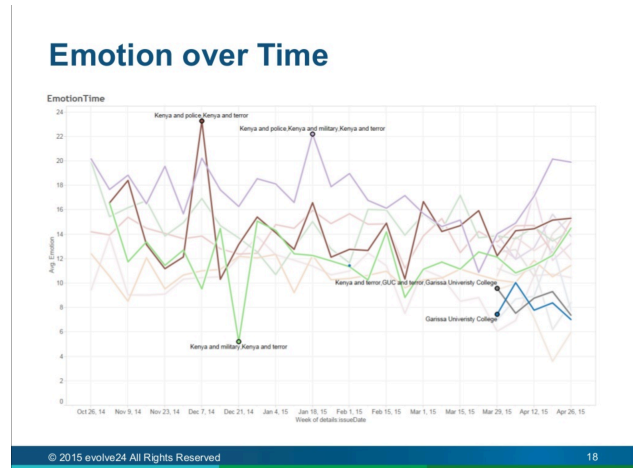
³ Choe, Lee, Lee, Pratt, and Kientz. "Understanding Quantified-Selfers," 1143-52.

⁴ Ibid.

⁵ Ibid.

easy as displaying a line graph tracking emotions over time.⁶

A line graph shows a person when they are and aren't doing well. It might even show what may have caused a certain data point. It fails, however, to provide complete context surrounding the data or foster improvement, and if a line graph trends downward, someone may start to feel hopeless.



My goal is to design a self-tracking interface for mental health data that evokes a positive viewing experience, encourages progress, celebrates achievement, and highlights opportunities to reverse negative trends. In this paper I will discuss the culture and theory that informs my work, my methods of research, creative work, and my recommendations for future work in this field.

Contextual Discussion

Narrative change is a process in psychotherapy where a patient understands a self-narrative (a story they are telling themselves about themselves), makes an argument against it, and realizes alternative self-narratives that might be more favorable to live by.⁷ By representing self-narratives in data and offering alternatives, people can complete the process of narrative change within the context of a mobile application.⁸ Narrative change is great for people who need to move from a negative mental state to a positive one.⁹ In situations where someone is in a neutral mental state but still wants to improve, we can look to Positive Psychology as a framework for happiness.

⁶ Evolve24. "Emotion Drives Behavior: Building a Data Narrative." *Data & Analytics*, 22:55:04 UTC. <https://www.slideshare.net/evolve24/emotion-drives-behavior-building-a-data-narrative/18>.

⁷ Ribeiro, António P., Tiago Bento, João Salgado, William B. Stiles, and Miguel M. Gonçalves. "A Dynamic Look at Narrative Change in Psychotherapy: A Case Study Tracking Innovative Moments and Protonarratives Using State Space Grids." *Psychotherapy Research* 21, no. 1 (January 2011): 54–69. <https://doi.org/10.1080/10503307.2010.504241>.

⁸ Ribeiro, Bento, Salgado, Stiles, Gonçalves. "Narrative Change," 54-69.

⁹ Ibid.

Martin Seligman, after being elected president of the American Psychological Association, proposed a new subfield of psychology.¹⁰ In his introduction of positive psychology, he described the PERMA model, which defines well-being in five necessary facets: Positive Emotions, Engagement, Relationships, Meaning, and Accomplishment.¹¹ Experiencing positive emotions means doing more of what brings enjoyment to daily life.¹² This should not and cannot be the sole contributor to well-being, but is an important factor in it.¹³ Having a sense of engagement comes from pursuing activities that are interesting and focus-absorbing.¹⁴ Deep, meaningful relationships fulfill humans' inherent social needs.¹⁵ Seeking meaning in life lets us realize something bigger than ourselves.¹⁶ Accomplishment refers to achieving goals and bettering ourselves.¹⁷

Giorgia Lupi is an experienced information designer and data visualization expert/pioneer/god; she offers tons of inspiration on designing data for context and narrative. *Dear Data* is a project where she and Stephanie Posavec decided to get to send each other visualizations of their everyday actions drawn on postcards and sent by mail every week for a year.¹⁸ The resulting project is a series of whimsical drawings that resemble the doodles of bored art students or avid journalers. Many of the drawings look inspired by natural things like flowers, tree branches, water ripples, dripping liquid, thumb prints, and biological cells. Other drawings look more mechanical, reminding me of encrypted code, motherboards, sheet music, and calendars.

¹⁰ Ackerman, Courtney. "What Is Positive Psychology & Why Is It Important? [2019 Update]." PositivePsychology.com, April 20, 2018. <https://positivepsychology.com/what-is-positive-psychology-definition/>.

¹¹ Ackerman. "Positive Psychology"

¹² Ibid.

¹³ Ibid.

¹⁴ Ibid.

¹⁵ Ibid.

¹⁶ Ibid.

¹⁷ Ibid.

¹⁸ Lupi, Giorgia, and Stefanie Posavec. "Dear Data." Personal Blog. Dear Data. Accessed September 25, 2019. <http://www.dear-data.com/theproject>.

DATA HUMANISM

~~SMALL~~ big data
data bandwidth ~~QUALITY~~
~~IMPERFECT~~ infallible data
~~SUBJECTIVE~~ impartial data
~~INSPIRING~~ descriptive data
~~SERENDIPITOUS~~ predictive data
data conventions ~~POSSIBILITIES~~
data to simplify complexity / ~~DEPICT~~
data processing ~~DRAWING~~
data driven design
~~SPEND~~ save time with data
data is numbers ~~PEOPLE~~
data will make us more efficient ~~HUMAN.~~

@giorgialupi

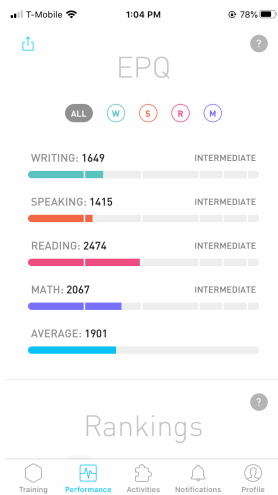
The approach that Giorgia uses when creating these visualizations is what she calls Data Humanism.¹⁹ Data Humanism shifts the goal of data visualization from direct representation to thoughtful storytelling.²⁰ Giorgia says that we must pay attention to the unseen limitations and nuances (context) in data, because “Blindly putting numbers in a chart is like reviewing a movie by analyzing the chemical properties of the cellulose on which the images were recorded.”²¹ Data Humanism is the method behind the creation of the *Dear Data* drawings. It allowed the postcards to convey a message about the lives of the designers, and display the underlying narrative in data.

Certain mobile applications deliver progress tracking through achievements interfaces. I reviewed apps such as Balance and Elevate that have been successful in motivating users through a continued mental practices. These apps have beautiful interfaces that reward users for consistent usage and skill progression with achievements and badges. Proven reward systems like these are helpful for encouraging and celebrating progress, but fall short of providing opportunities to identify and reflect on personal narratives. Elevate’s skill measurement interface hints at personal narrative by giving users a view of how they have been allocating their focus.

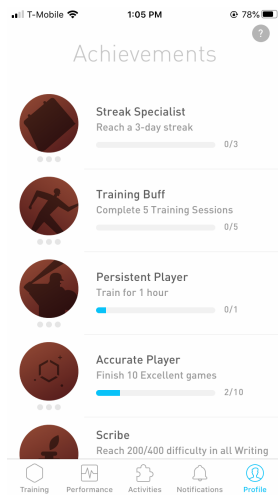
¹⁹ Lupi, Giorgia. “Data Humanism.” Accessed April 22, 2020. <http://giorgialupi.com/data-humanism-my-manifesto-for-a-new-data-world>.

²⁰ Lupi. “Data Humansim.”

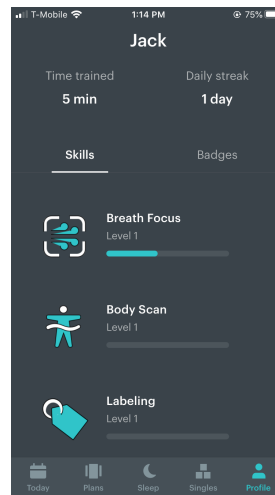
²¹ Ibid.



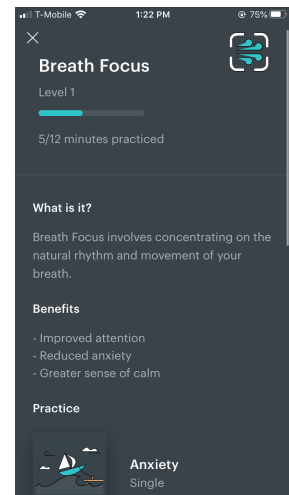
Elevate:
Skill measurement



Elevate:
Achievements list



Balance:
Skills list



Elevate:
Skill detail

Methodology

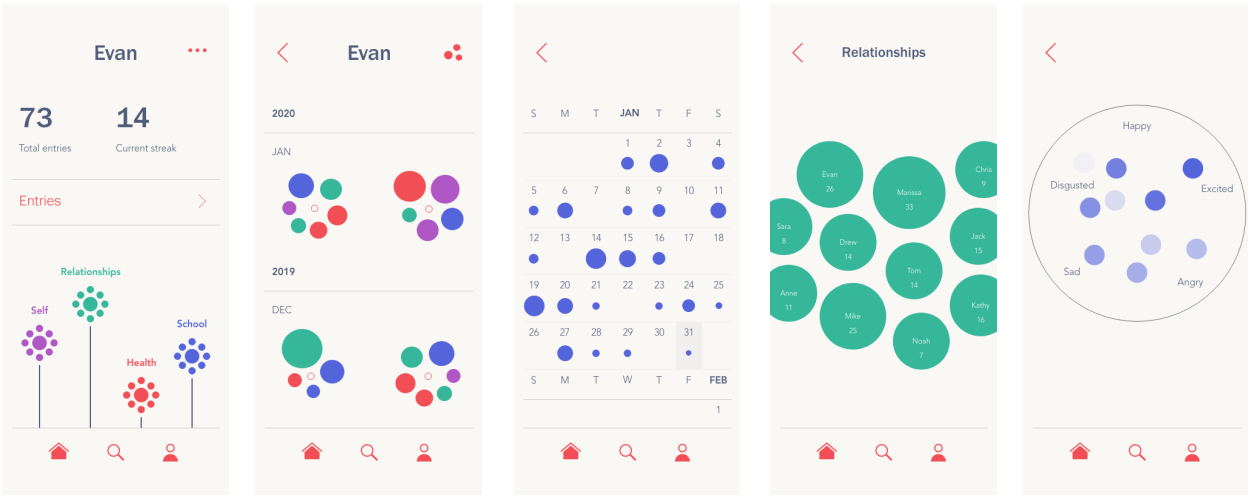
To get a foundation for my visual strategy, I conducted primary research on the perception of different data visualization styles. I gathered a diverse pool of data visualizations, including different methods and styles of representation. In an online survey, I displayed one image at a time and asked participants to imagine that it represented data from their daily emotions. Participants then indicated how positive or negative the image felt to them on a 1 to 7 scale. Almost all of the positively perceived images used a variety of bright colors; soft pinks, blues, and greens were frequent. Many involved plant/tree structures, which may indicate a form of growth or progress. Many looked hand drawn or organic in style, which may have been less intimidating and more natural to look at. Many involved an abundance of elements, which may create feelings of excitement. The negatively perceived images were more rigid in style and limited in color palette. There was also less visual evidence progression or growth in these visualizations, which might have been indicated by plant-like structures or a change in the scale of elements. After 174 responses, I concluded that we prefer data visualizations that are colorful, representational of nature, and visually abundant.

This visual strategy relies on biomimicry. The harshness of traditional charts and graphs is not agreeable to the kind of data I am working with, so I had to design a new style of visualization.

Biomimicry is a process of design that uses nature as inspiration.²² Using nature as a framework for data visualization results in more organic visuals. Whenever I am designing a new piece of the product, I think about what natural processes I can use as a model, whether it be growing flowers or rippling water.

In order to create more mentally friendly self-tracking visualization, I needed a self-tracking system to source the data from. Months ago, I noticed that many of my friends write about their thoughts and actions in journals as a method to navigate mental distress. This led me to design a journaling application where users make entries about what’s going on in their lives. This would serve as my data collection method. In sum, my project would take data from journal entries (i.e. people’s words), and arrange them into visualizations that inspire a healthy understanding of one’s data and a willingness to improve on their practice.

Much of my process involved rapid prototyping. I knew that the experience of viewing data visualizations was central to the success of the product, so I spent a lot of time watching people react to it and listening to their thoughts. I went through many phases of iteration with peers and advisors, taking feedback very seriously and drastically changing the product if necessary. With each round of iteration and feedback, my goal was to find a solution that made people think positively about the data they were seeing, and feel encouraged to make more progress.



Allocation of focus by topic

2-week periods of data visuals

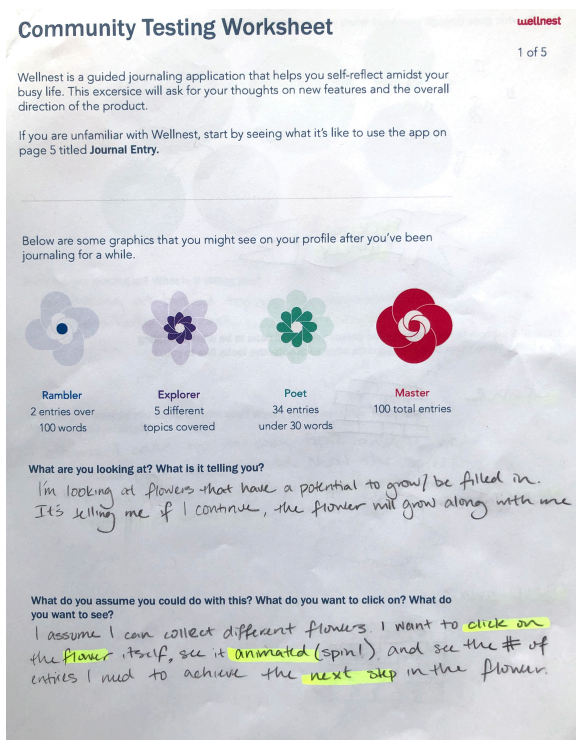
Daily user activity density

Word frequency cloud

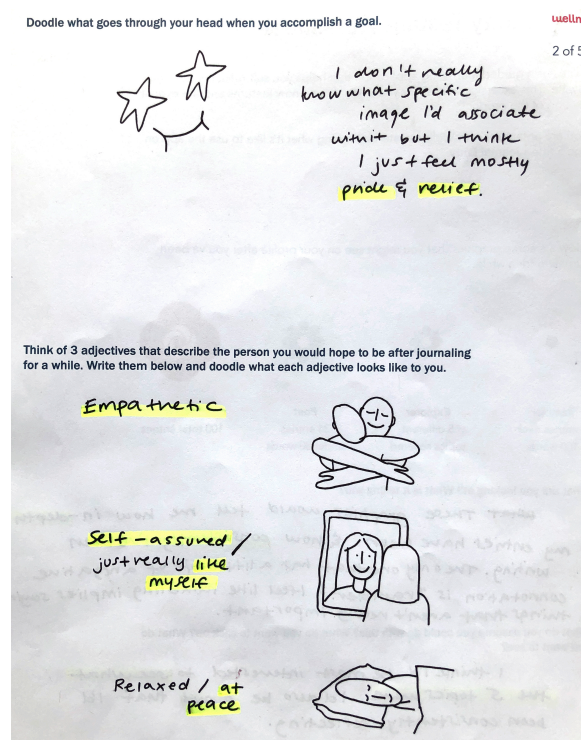
Recent emotions map

²² Benyus, Janine M., Design in Nature : Biomimicry. Visual Material. New York, NY : Bloomberg L.P., 2016.

I involved my peers (a.k.a. college students, my target audience) in the conception of the product as well. I asked a handful of students to complete a worksheet including written and drawn responses. The worksheet presented images of things they might see in the app, and asked them to identify what they were looking at and what it could be used for, which provided a lot of good usability feedback for me to think about. Some of the questions asked them to generate lists of adjectives or make doodles visualizing certain emotions, which helped me make decisions on the actual content in the interface (e.g. vocabulary, tone-of-voice, animation).



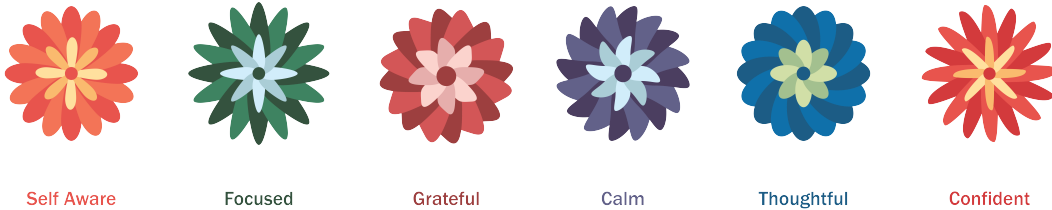
Questions about how some early achievement iterations are being understood.



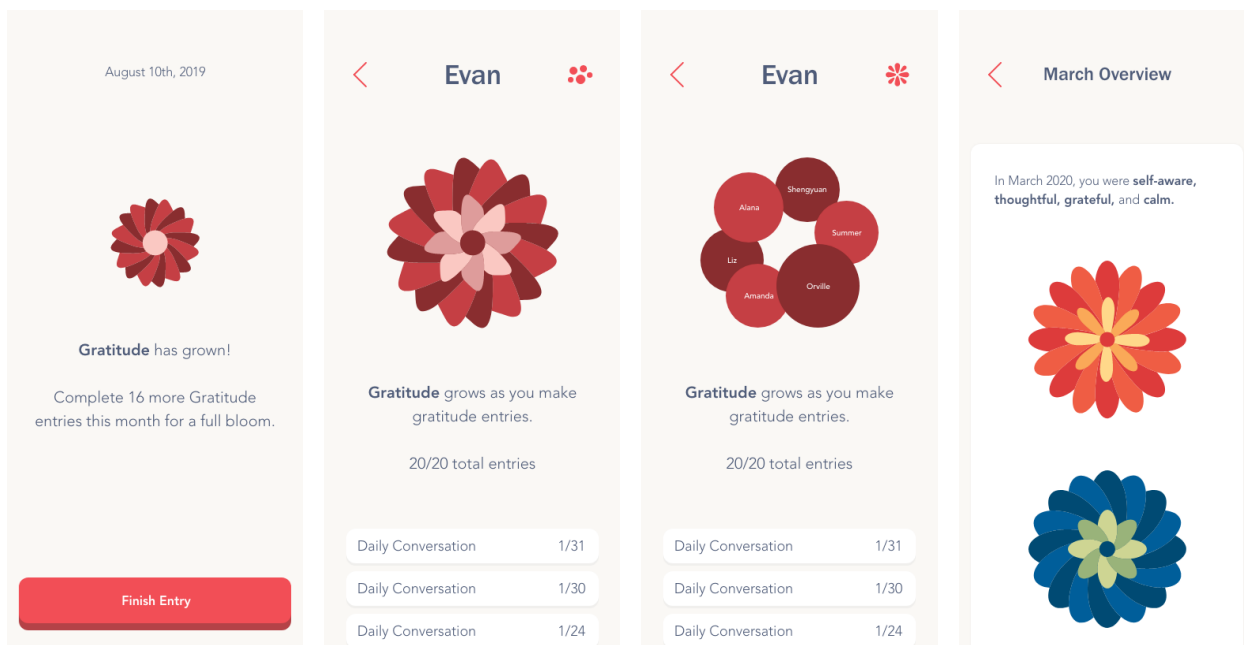
Drawings illustrating ideal states of mind while using the app.

Creative Work

This project will take the form of a coded application. It will be installed into an existing journaling interface as the Skills and Insights feature. The feature will offer 6 Skills to grow.



Skills are built in different ways, each counting progress made on a certain category of journal entry. A user see's a skill-flower grow directly after making an entry, has the ability to view entries and words associated with that skill, and receives monthly reports on their progress.



The interface evokes a positive viewing experience by using organic forms and a varied color palette. It encourages and celebrates progress and as flowers grow, bloom, and are reported back. It highlights personal trends by displaying frequently used words on each topic. It allows for change by saving a report and resetting the achievements every month.

Conclusion

The goal of this project is to facilitate continued journaling and self-reflection in a way that is pleasant and encouraging. The resulting product-feature is a skills and insights user interface that uses flower growth as a metaphor for personal progress and displays narrative with contextual data.

Biomimicry is traditionally used in product design as a means to create efficient systems.²³ This project instead used the principles of biomimicry in a very visual sense. Organic visual paradigms relate well to how people want to think about their mental data, and has many potential applications. There is a lot of room for the exploration of different visualization types, the data sets they illustrate, and the varying levels of complexity in visualization of and interaction with the data.

Allowing for shifts in self-narrative during data-viewing is another concept that can be explored further. This includes the design of data and context in a way that communicates a narrative, and the ability of the user to identify and work towards alternative self-narratives.

²³ Benyus. "Biomimicry"

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