CS171 Final Project Process Book

VSCode Gorls

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Week 8: Project Proposal

Project Title: Our Tech Industry Can Do Better

Abstract: As women in computer science, we have all felt frustrations within the tech industry and how prevalent mental health issues can be. While tech companies are attempting to address the issue, it is clear that the issue has not been resolved, and there are still greater steps we can take. Therefore, we would like to investigate and highlight trends within the tech industry about mental health, specifically focusing on trends across gendered and racialized categories and the efficacy of corporate benefits and wellness programs. We also are curious about the impact of remote work on mental health within this industry. Our current goals are to spread awareness about where the tech industry might be failing its employees and what it can possibly do better. Our proposed datasets include a Kaggle dataset taken from the OSMI Mental Health in Tech Survey in 2014: https://www.kaggle.com/osmi/mental-health-in-tech-survey. This also includes data from an ongoing survey conducted in 2016. We also plan on working with more datasets that might include race-disaggregated data within this industry to create a more nuanced data story.

Week 9: Team Agreement & Plan

Link to Team Agreement Form:
https://docs.google.com/document/d/1nCZ5Cze-zkx1-mdPKoe5odCya_ceYi1wQUhPNesH5hk/edit?usp=sharing

Basic Info

Title: Our Tech Industry Can Do Better
Team Name: VSCode Gorls
Leader: Sarah Yoon (sarah_yoon@college.harvard.edu)
Group Member 1: Linda Lee (suminlee@college.harvard.edu)
Group Member 2: Cecilia Baek (cbaek@college.harvard.edu)

Background and Motivation

As women in computer science, we have all felt frustrations within the tech industry and how prevalent mental health issues can be. While tech companies are attempting to address the issue, it is clear that the issue has not been resolved, and there are still greater steps we can take. Therefore, we would like to investigate and highlight trends within the tech industry about mental health, specifically focusing on trends across gendered and racialized categories and the efficacy of corporate benefits and wellness programs. We also are curious about the impact of remote work on mental health within this industry. Our current goals are to spread awareness about where the tech industry might be failing its employees and what it can possibly do better.

Related Work

Cecilia:

I thought that this would be an interesting topic because I'm currently taking HISTSCI 172 which is a class on mental health and I've had experience working at a big tech company. When I was at the big tech company last summer, I saw that they had a lot of mental health resources but I'm curious how effective they are and how mental health resources differ by company and location.

Linda:

While interning at a big tech company this past summer, I observed the attitudes and policies they had toward mental health and became curious about whether these policies were actually contributing to the mental health of employees in the industry. I'm curious as to why issues in mental health are still so prevalent in this industry today despite company efforts to address them. I'd like to use this final project to explore the data surrounding this topic and to see what sorts of insights we can both draw and present from visualizing the data.

Sarah:

I am a Women's and Gender Studies secondary as well as an alumnus of Girls Who Code so the intersection of tech with gendered issues (and power dynamics in general) are of particular interest to me. Unlike Cecilia and Linda I've worked focused on SWE in non-corporate settings (startups, non-profits), so that may be an interesting contrast to explore in our analysis.

Audience and Questions

Audience: People who are interested in the tech industry. This could be people who are currently working in the tech industry or thinking of going into the tech industry.

Primary questions:

- What has the state of mental health been like in tech industries so far?
- How effective have the changes in the industry been in terms of impacting the observed trends in mental health?
- What is the relationship between remote work and mental health of employees?

- What kind of culture surrounds mental health in the tech industry? Are employees comfortable talking about their mental health at work?
- Can they talk about mental health with coworkers?
- Can they talk about mental health with managers?
- Would they be willing to disclose mental illnesses during interviews?
- What does the gender demographic of the tech industry look like?
- How does an employee's gender impact their opinions on mental health in the company?
- Do tech companies offer benefits with mental health care?
- Do tech employees utilize mental health care benefits?
- Are there gender gaps in the perceived mental health support provided by tech companies?

Overarching Goals and Objectives:

- Find out what the current status of mental health in tech
- Identify any correlated relationships or trends within the industry or company that impact mental health.
- Highlight disparities in mental health among gender and/or racial/ethnic groups in the industry
- Identify any insights that might lead to a call to action or next steps for positive change

Data:
We found our data from Kaggle, a dataset directory website. Our dataset consists of answers from a survey titled "Mental Health in Tech" from various years.
https://www.kaggle.com/osmi/mental-health-in-tech-survey

Data Cleanup

For this project, we do not expect to need a substantial amount of data cleanup. The data sets that we found for the OSMI Mental Health in Tech Survey all came in easy to read CSV formats where each row represented a different survey response while the columns represented different questions. These data sets were split by the year of the survey.

The data collected seems to have allowed participants to type in their gender identities (rather than select from a set of options), so we will need to make responses referring to the same gender identity (ex. f/F/female/woman/etc.) consistent, while respecting responses that fall outside the cisgender binary. To do this, we plan on using Python to go through the CSV and replace values as needed to standardize the data. By creating a Python program to do this, we can feed each CSV into the program to get a standardized CSV as output.

There are also multiple datasets each for different years with slightly varying questions, so if we want to aggregate these data and visualize changes in survey responses over time we'll need to standardize certain fields. We will do this by identifying questions that are similar between the different years and aggregating them into a single CSV.

Week 10: Sketch, Decide, and Storytelling

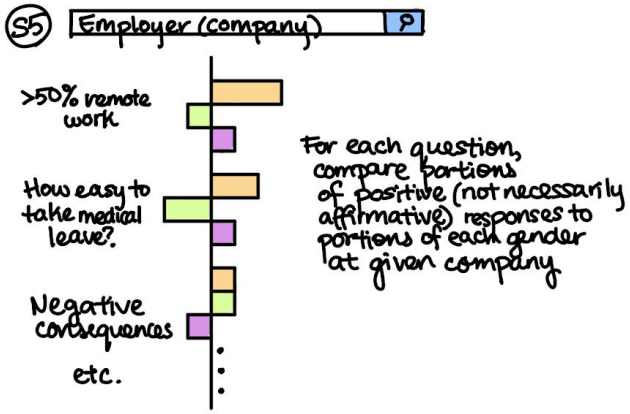
Data Set

For this project, we gathered our data from Open Sourcing Mental Illness (OSMI) and we plan on using their 2014, 2016, 2017, 2018, 2019, and 2020 OSMI Mental Health in Tech Surveys. We downloaded the raw data for each survey from the site and then created a Python program that would help us clean up the data. For example, in these surveys, participants were able to type in their gender identities rather than selecting from a set of options. This created discrepancies between survey responses (ex. "Female", "female", "f", "F"), so we used the Python program to make the responses more consistent (changing all representations of female into "female"). The cleaned data can be found in our GitHub along with the Python program.

Sketches

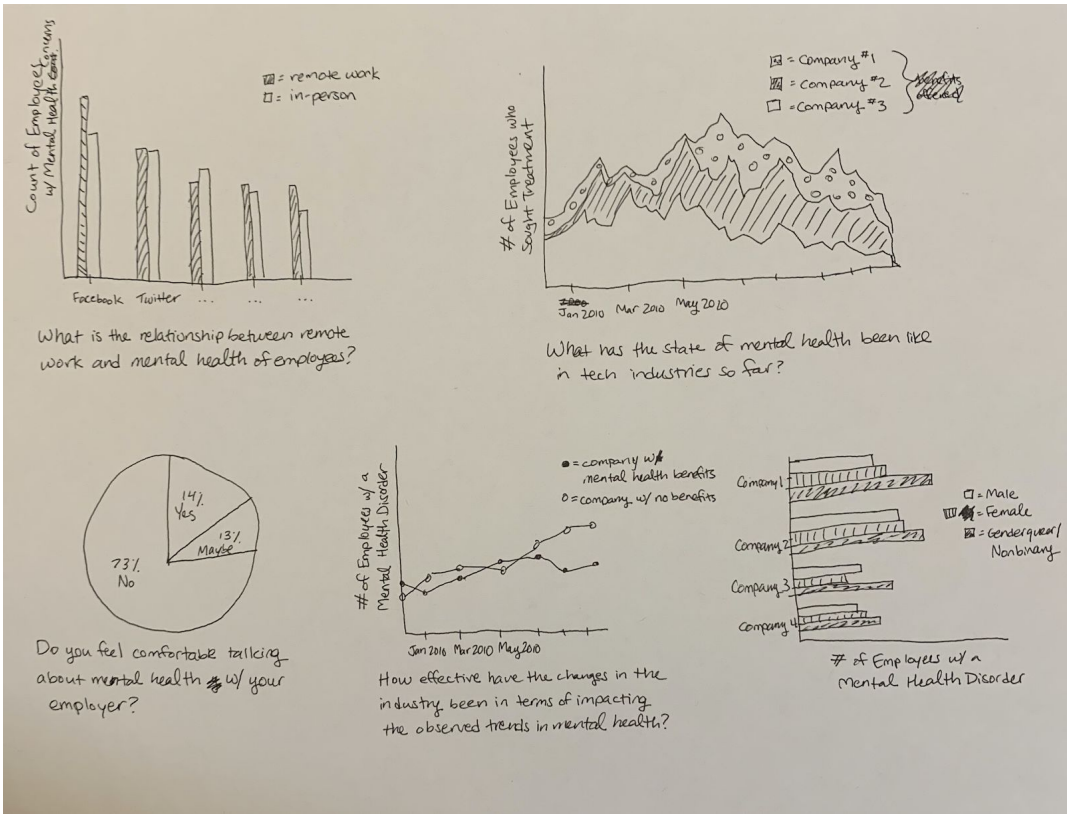
1. Sarah

a.



b.

2. Linda

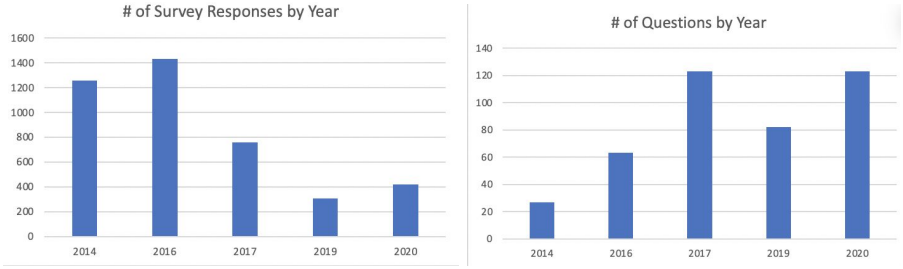


a.

b. *Numbered Horizontally

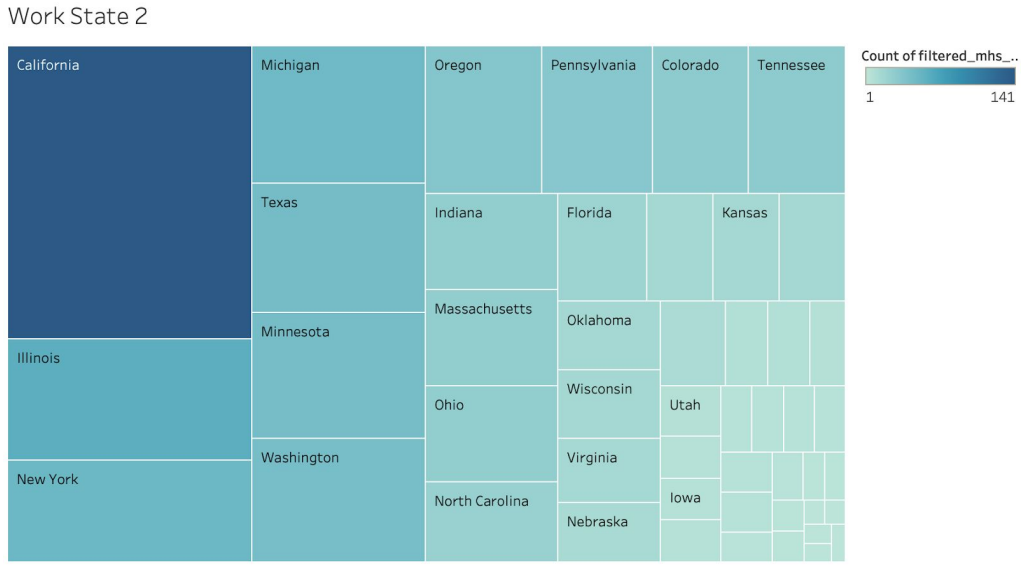
3. Cecilia

a.



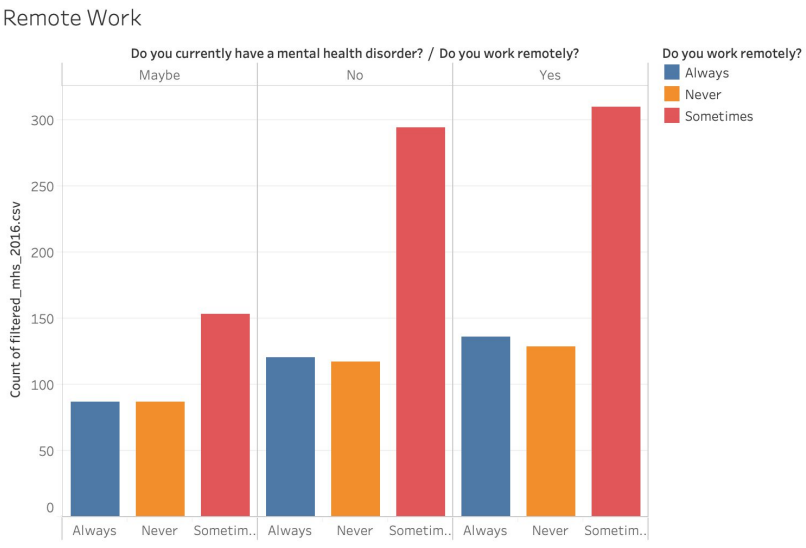
b.

c. Map based on Longitude (generated) and Latitude (generated). Size shows count of filtered_mhs_2016.csv. The marks are labeled by What country do you work in?. Details are shown for What country do you work in?.



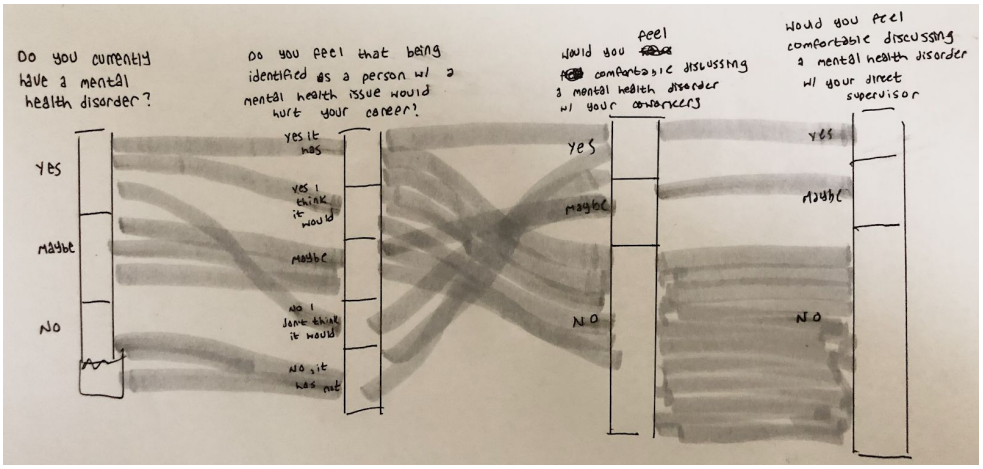
d. What US state or territory do you work in?. Color shows count of filtered_mhs_2016.csv. Size shows count of filtered_mhs_2016.csv. The marks are labeled by What US state or territory do you work in?. The view is filtered on What US state or territory do you work in?, which excludes Null.

e.



Count of filtered_mhs_2016.csv for each Do you work remotely? broken down by Do you currently have a mental health disorder?. Color shows details about Do you work remotely?.

f.



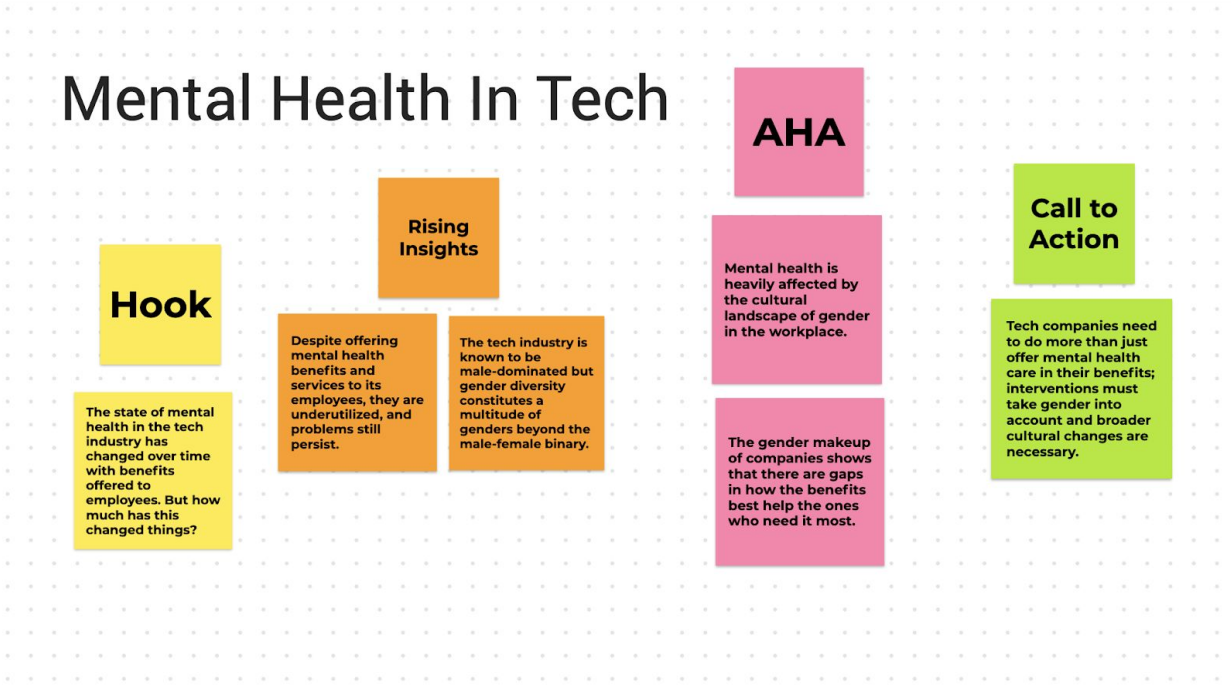
Sketch Votes:

S1:	L1:	C1:
S2:	L2:	C2:
S3: CB, LL, SY	L3:	C3:
S4: LL, CB, SY	L4: SY, CB	C4: LL
S5: LL, SY, CB	L5:	C5: LL, SY, CB

Final Visualizations: L4, C5, S3, S4, S5

Main Message: Although tech companies offer mental health benefits and services to its employees, they are underutilized, and problems still persist. Tech companies need to do more than just offer mental health care in their benefits; interventions must take gender into account and broader cultural changes are necessary.

Data Storyboard: See Jamboard



Week 11: Prototype V1

GitHub Repository: https://github.com/syoon123/vscode-gorls

Names of Students that worked on prototype V1 submission:

Linda:

- Began implementing line graph for benefits (L4)
- Incorporated textual storytelling into website
- Textual descriptions and sketch designs of interactions
- First design of innovative views

Cecilia:

- Began work on data scraping/cleaning (gender filtering)
- Implemented first draft of grouped stacked bar chart (S4)

Sarah:

- Created skeleton for the website
- Finished data cleaning
- Implemented first draft of horizontal bar diagram (S5)

Storytelling Flow:

Where are we now?

A Look into Mental Health Trends at Tech Companies

The tech industry is still a relatively modern space, though it is characterized by rapid growth and innovation. Mental health has already been a widely discussed issue within its employees, and many companies have touted policies and benefits to address it, such as wellness days and company events. We begin our analysis by a first look at how these trends have changed overtime, breaking down the data by company size.

What is the culture around mental health in tech?

Existing stigma around mental health within industry and company culture

While policies around mental health seem to be improving on paper, simply offering benefits is only half the battle. Despite these widely available benefits, the data show that tech employees are still reluctant to utilize these benefits or to disclose their mental health with their employers, exposing a wide gap between the potential of benefits and their actual efficacy. The conversation around mental health may have started, but how prepared is the tech industry to carry it out?

Play around with the diagram to focus on specific question paths.

How is gender distributed within the industry?

The notorious disparity in gender in the modern tech realm

Another rampant criticism about the tech industry has been its insufficient representation of gender. Compared to men, who make up XX% of the industry, women only comprise YY% whereas nonbinary and gender-nonconforming employees only make up ZZ%. Each dot represents one survey respondent and tech employee in the data. Within an industry where mental health is still a wary topic and an employee's experience can be vastly different depending on their gender, we will next explore how these two issues intersect and even compound the reaches of their impact.

Hover over the dots to see statistics about a specific gender demographic.

How does identity enter the conversation about mental health?

Culture around mental health broken down by gender and company size

This stacked bar chart visualizes the survey responses to various questions pertaining to employees' perceptions about mental health in the workplace, partitioning each bar by the gender of the respondents. From this data, we can see an overwhelmingly high representation of male respondents in comparison to other gender demographics. What sort of influence does

this have on the distribution of data? We will next explore how much gender can impact your experience discussing mental health in the workplace.

Click on each bar for a closer look at the gender breakdowns for each response and company size.

How much does gender impact perceptions about mental health?

The confounding role that gender plays in industry stigma

overlays entire section before visualization

We measured the difference between the representation of different gender identities and their responses to the culture and policies around mental health in the industry in order to fully focus on how mental health is affected for each gender demographic. In other words, is the distribution of gender within the industry consistent with the distribution of gender among positive perceptions of how the workplace handles mental health?

fades out to reveal visualization

In order to analyze these distributions, we subtracted the proportion of each gender identity among the respondents who indicated a positive perception of mental health policy/company culture from the proportion of that gender out of the total respondents. The resulting proportion depicts the difference in gender representation for a given statement where 0 indicates no difference in perception based on gender. In this visualization, a positive perception is interpreted as a positive value (+) whereas a response implying a stigmatized or inadequate perception of mental health response is encoded as a negative value (-).

** next -> button**

So what does the data tell us? When considering the representation of men in the industry, males disproportionately believe there are inadequacies in policies and benefits offered by their companies but would feel comfortable utilizing them in comparison to women and gender-nonconforming groups. However, women and gender-nonconforming groups disproportionately perceive a cultural stigma against mental health in the workplace compared to men and do not utilize the available benefits despite their awareness of them.

Where can we do better? (call to action - no viz)

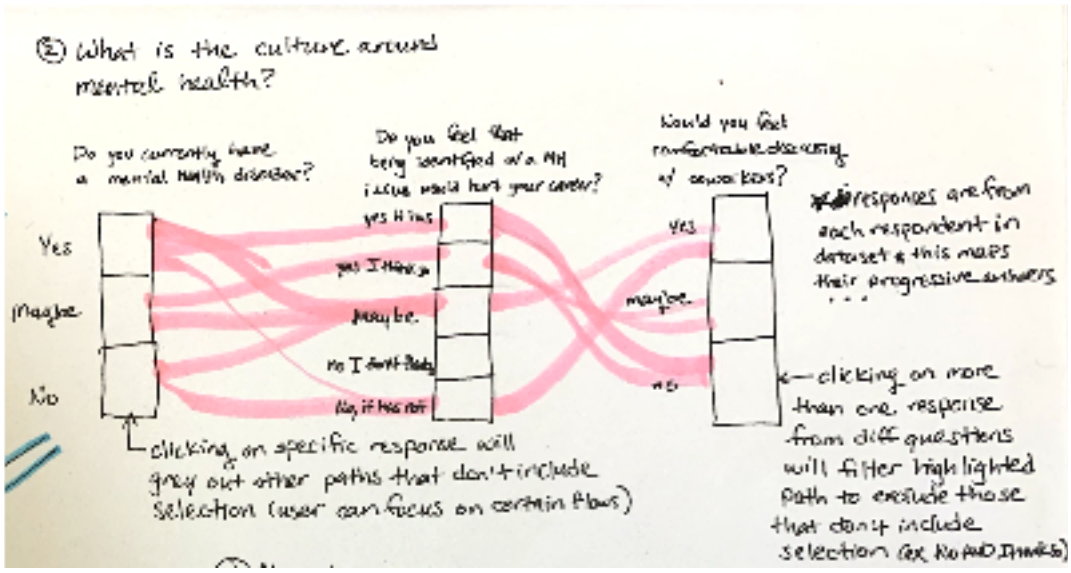
This leaves us with an alarming gender discrepancy within the tech industry's understanding and attitude around mental health. While it may seem that gender identity may impact perceptions about mental health differently, both opinions are rooted in a problematic cultural stigma around mental health. Within the industry, men are assumed to not need mental health benefits as much and therefore lack an awareness about the benefits out there. Women and gender-nonconforming groups, on the other hand, receive more priority when companies

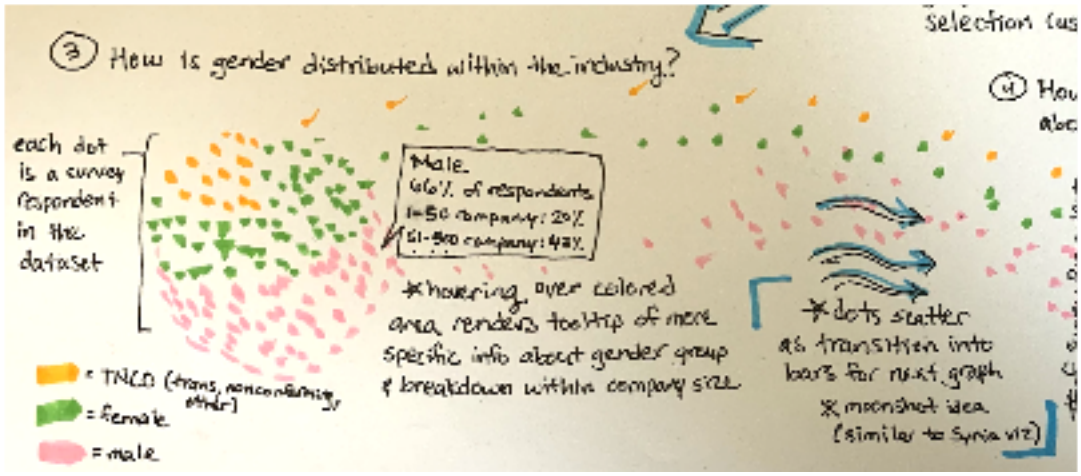
promote their benefits in theory, but the remnant discriminatory attitude about these gender identities have created a hostile industry culture that stigmatizes mental health concerns in practice.

In order to truly improve mental health in the tech industry, we must begin with reforming the cultural understanding and attitude about how mental health impacts everyone. Men, too, struggle with mental health, and within an industry that favors them, they will utilize these benefits if they are encouraged. As for women and gender-nonconforming groups, we must "walk the walk" by creating a supportive culture that makes them feel safe and valued. Only in a culture that fully empowers all can we truly improve the mental health that so many struggle with in the tech world.

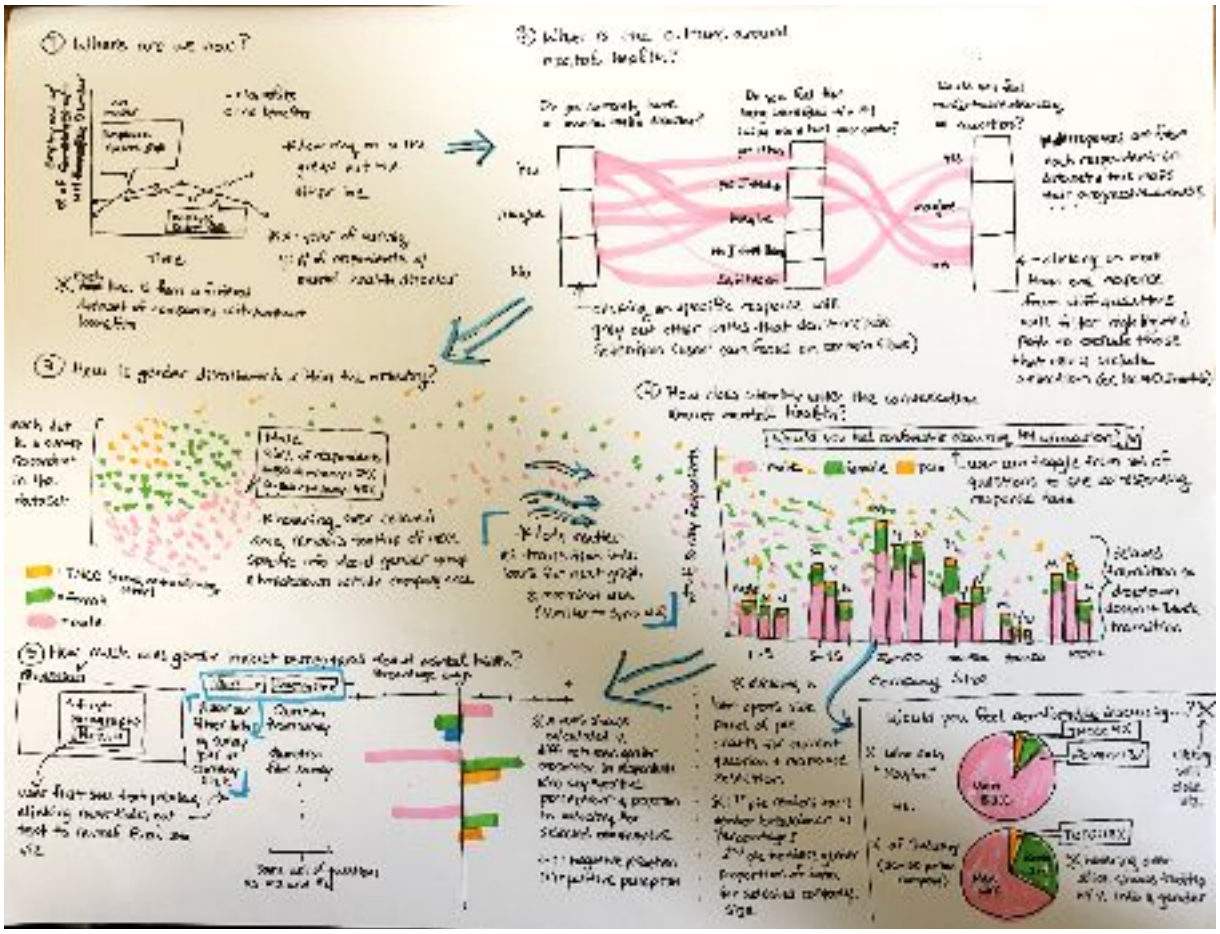
Final Cleaned Data: https://github.com/syoon123/vscode-gorls/tree/main/data

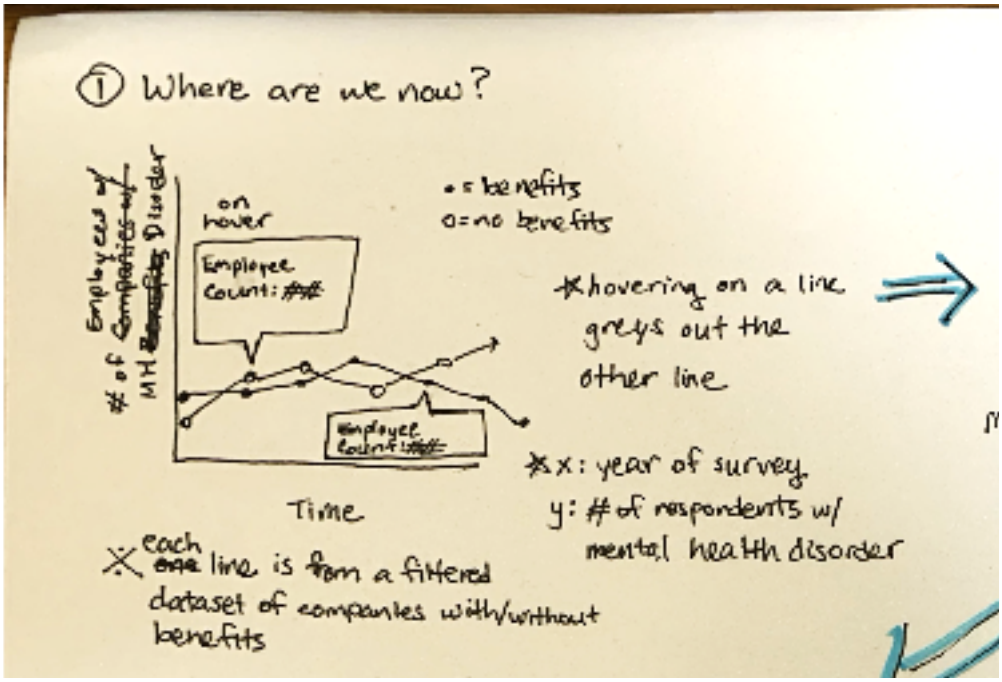
First Design of Innovative View:

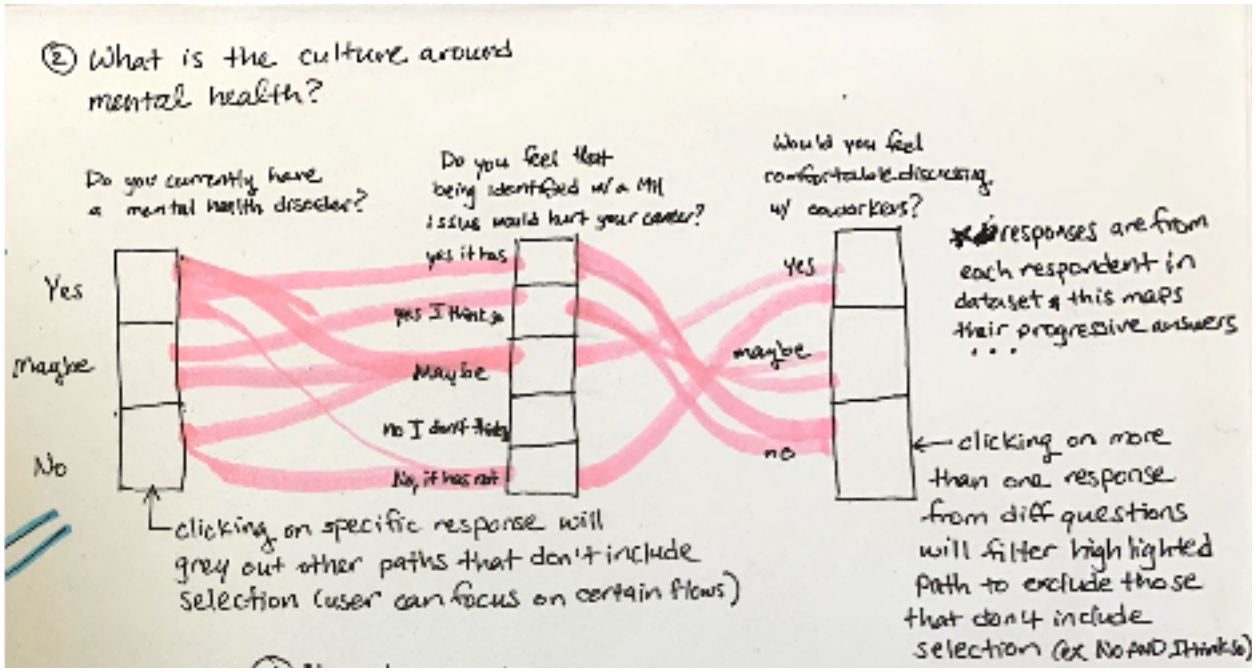


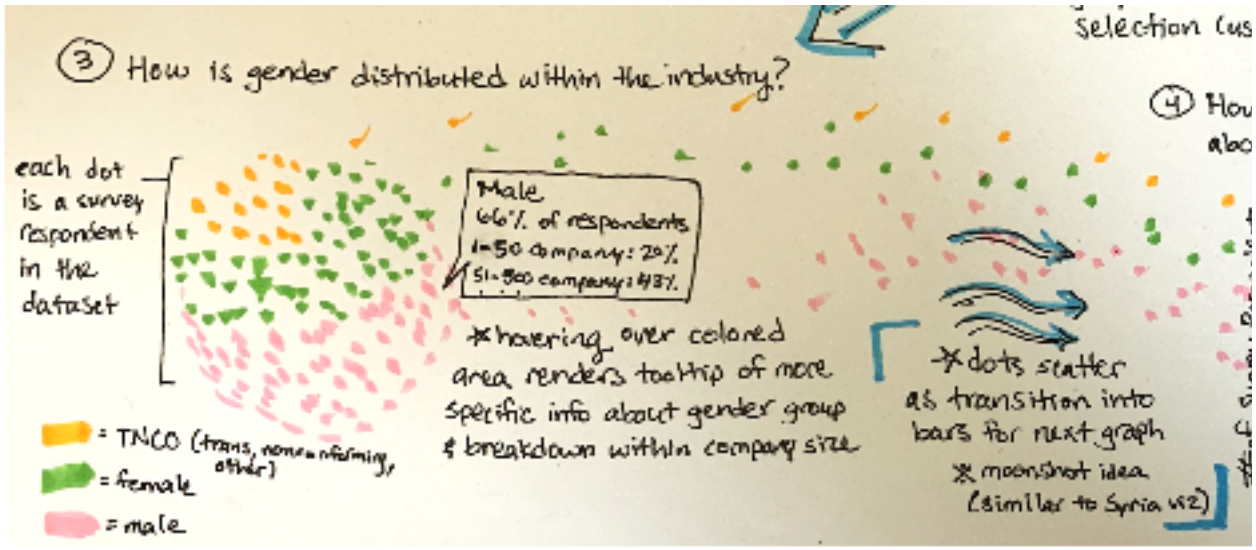


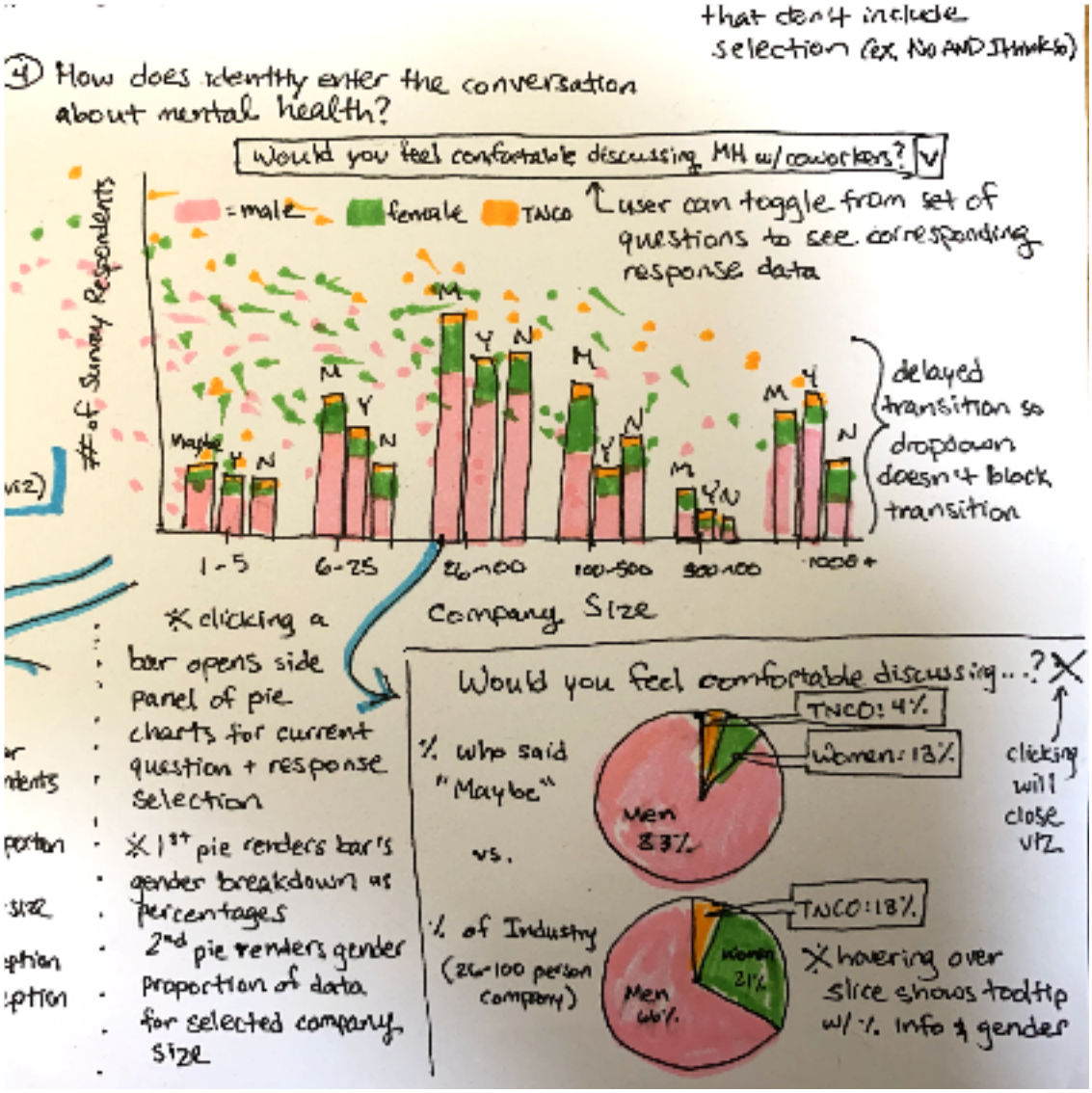
Interactions Designs:

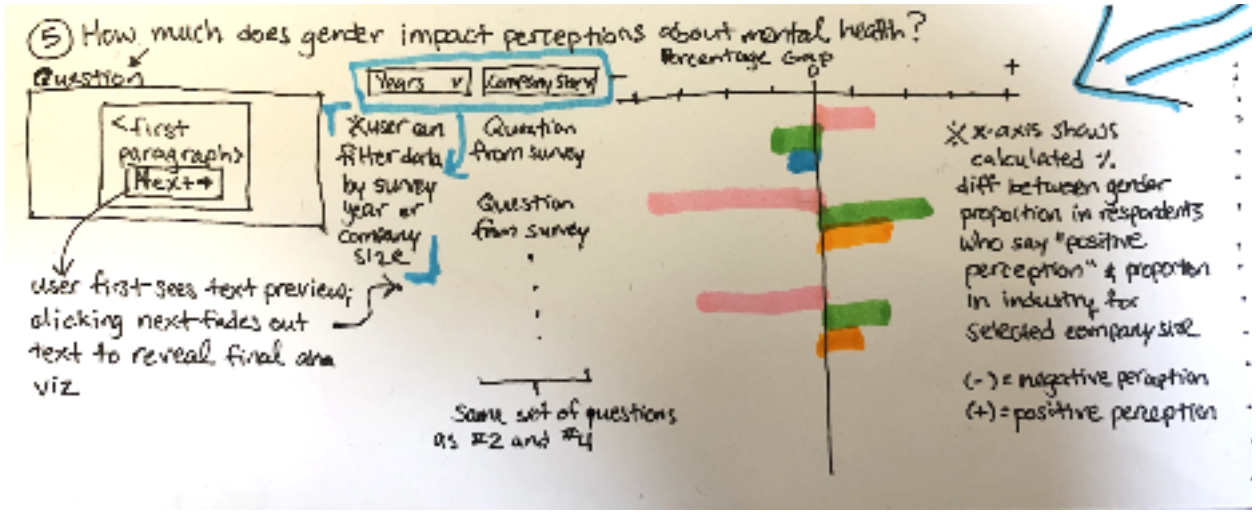





② What is the culture around mental health?
Do you currently have a mental health disorder?
Yes
Maybe
No
Do you feel that being identified w/ a MH issue would hurt your career?
yes it has
yes I think so
Maybe
no I don't think
No, it has not
Would you feel comfortable discussing w/ coworkers?
Yes
maybe
no
*responses are from each respondent in dataset & this maps their progressive answers
clicking on specific response will grey out other paths that don't include selection (user can focus on certain flows)
clicking on more than one response from diff questions will filter highlighted path to exclude those that don't include selection (ex. No AND I think so)


③ How is gender distributed within the industry?
each dot is a survey respondent in the dataset
Male
66% of respondents
1-50 company: 20%
51-500 company: 43%
*hovering over colored area renders tooltip of more specific info about gender group & breakdown within company size
*dots scatter as transition into bars for next graph
*moonshot idea (similar to Syria viz)
= TNCO (trans, nonconforming, other)
= female
= male


that don't include selection (ex. No AND Thanks)
④ How does identity enter the conversation about mental health?
Would you feel comfortable discussing MH w/ coworkers? Y
male
female
TNCO
User can toggle from set of questions to see corresponding response data
# of Survey Respondents
Maybe Y N
M Y N
M Y N
M Y N
M Y N
delayed transition so dropdown doesn't block transition
1-5
6-25
26-100
100-500
500-1000
1000+
Company Size
clicking a bar opens side panel of pie charts for current question + response selection
1st pie renders bar's gender breakdown as percentages
2nd pie renders gender proportion of data for selected company size
Would you feel comfortable discussing...?
% who said "Maybe" vs. % of Industry (26-100 person company)
TNCO: 4%
Women: 13%
Men 83%
TNCO: 18%
Women 21%
Men 60%
clicking will close viz
hovering over slice shows tooltip w/ %. info & gender


⑤ How much does gender impact perceptions about mental health?
Question
<first paragraph>
Next →
user first sees text preview; clicking next fades out text to reveal final dna viz
Years
Company Size
user can filter data by survey year or company size
Question from survey
Question from survey
Same set of questions as #2 and #4
Percentage Gap
+
x-axis shows calculated % diff between gender proportion in respondents who say "positive perception" & proportion in industry for selected company size
(-) = negative perception
(+) = positive perception