Project Report

1. Design Justification

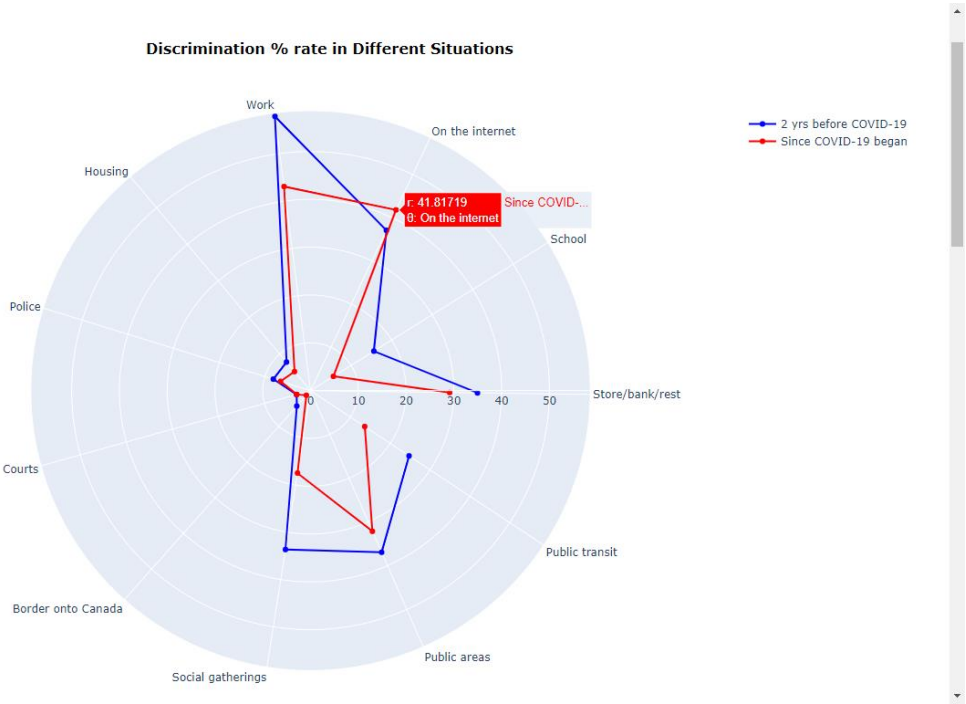
For our visualization, we decided to use a dashboard to highlight multiple aspects of the data. This was something we decided on from the beginning because our data questions focused on how discrimination factors affected people in different provinces and situations, in addition to the impact on people's sense of belonging to different communities. For displaying the rate of discrimination in different situations, a polar chart was constructed to effectively visualize the discrimination rate before and during the pandemic (1). Points were used as the visual mark and colour hue was used to clearly differentiate temporal data. Spatial region was used to separate the categories in a circular arrangement, and position on each scale line indicated the discrimination rate. As position and spatial region are the most effective variables for dimensions, they are used to show the most relevant information (Discrimination rate in different situations). Also, since colour hue is a preattentive variable, it's utilized to discern points for different time periods (Before vs. during the pandemic). For displaying people's sense of belonging to different communities (2), horizontal position was used for communities, size for the percentage of people in each degree of sense of belonging encoded by vertical position and color hue to further track them in other communities. With consideration of alternative sketches (3 & 4), we chose a diagram of parallel categories to highlight correlations between vertical axes and also encode multiple dimensions. The colouring of lines is meant to highlight the relationship between sense of belonging from local community to other communities. For displaying the change in discrimination rate (Rate during pandemic – Rate before pandemic), we used a choropleth map (5). For the colour scale, a divergent scale was used with 0 as the middle point, and the colours red and blue indicated an increase and decrease in discrimination rate respectively. The colour value for each colour emphasized the actual quantity. This map was essential in seeing trends across Canada for discrimination factors as it helped in immediately seeing how the pandemic affected provinces. One of the important choices was that to maximize the size of each visualization in the dashboard to help users see all the details clearly and without any graphical distortion. Users can use the scroll to focus on a specific visualization in a clear view, which helps in maximizing the amount of data shown. For the dashboard, it was very important to have a dropdown menu for different discrimination factors. This is very effective for users who want to focus on a specific discrimination factor and see the impact of it across various provinces, in different situations, and on sense of belonging. Note that all the visualizations are updated once the user clicks on a specific factor from the menu. More specifically, users can interact with each diagram inside the dashboard independently. The polar chart can be rotated in order to align a category with the scale for easier reading of the quantitative data. In addition, for the most accurate rate percentage, users can hover on different points to see the discrimination rate. For the parallel categories diagram, the columns for dimensions can be rearranged to directly perceive the connections between two communities. Users can also see the number of people who had the highlighted levels of belonging to the 4 different communities. Hovering over the rectangles for each dimensional column, displays the number of people that had that level of belongingness to the community. These are all essential for users who want specific details on demand with a high level of temporal directness. Similarly, for the map, users can hover over different provinces to see the exact discrimination rate.

2. Reflection on Learning

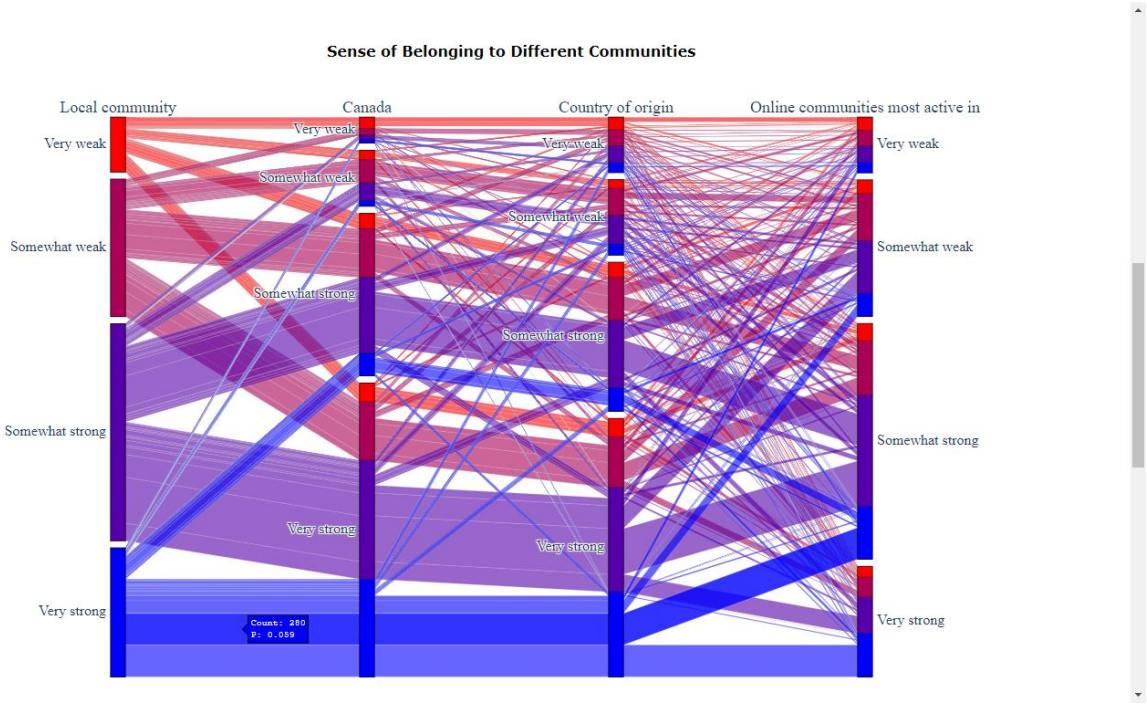
This course has taught me many things about the visualization process, teamwork, ideation, and concepts around data visualization. First and foremost, I found the vizitcards activities to be an incredibly beneficial experience to me since it taught me how to work within a team to develop ideas quickly, discuss each other's visualizations constructively, and collaborate in order to unify our ideas. In the first couple in-class activities my main challenge was sketching ideas quickly. I often spent a lot of time thinking about the rationale behind my visualization and also tried to delicately sketch visualizations. What I learned very quickly was that ideation was not about coming up with the perfect visualization idea. In the ideation process, there are no "bad" ideas. It's all about coming up with quick ideas that help answer data questions, convey meaning to the audience, and tell a meaningful story about the dataset. Soon, I learned not to be too precious about my ideas, and sketch whatever I had in mind. When it came to communicating my ideas in my teammates, I sometimes struggled to translate my visual ideas. So, I decided to search for lectures and talks about data visualization. I found the videos by David McCandless to be very engaging. At the beginning, I couldn't pinpoint the exact reason on why he always managed to make the audience interested about the visualizations. Once the topic of storytelling was covered during the class in a live lecture, I realized that he used many of the discussed storytelling techniques. He often highlighted patterns and trends, made the visualizations relatable to his audience, talked about the visual marks and variables, annotated and labeled the visualizations meaningfully to support his points, etc. From my perspective, all the design choices he made was deliberate and nothing was accidental. Subsequently, I tried to reflect this idea in my own work and be considerate about my visualization's main point, layout, typography, font sizes, colours, titles, labels, annotations, etc. This was a huge help in communicating my ideas to others and explaining information visualization. Furthermore, critique of visualizations has been a very important topic in this course. It became very obvious to me that it's not at all totally subjective. There are principles of good visual design that must be referenced in order make how we critique designs objective and reasonable. To go beyond liking or disliking visualizations, one has to carefully dissect all elements of designs and assess how effectively it tells a story about the dataset. This is also why I found the series of visualizations that were presented in the class very insightful. Hearing other people's critique of visualizations and their reasoning for why a design is good or bad is a big eye opener. Therefore, it's always helpful to see examples of what work and what doesn't work in a visualization and ask questions about its strengths and weaknesses. In addition to everything I've stated, I believe that my most important learning in this course was about teamwork. Both in in-class activities and the project, collaboration and communication was vital for succeeding. I found out that there is never a best solution for a problem or a set of data questions. It's only possible to work together in order to honestly critique and build on each other's ideas. Sometimes, this has to be done in a very short time period. For in-class activities, there was no time to waste, and the short time limits actually helped in coming up with creative solutions. In groupwork, I discovered that the best way to achieve our goals and answer the data questions is to deconstruct our visualizations and critically assess the application of good visualization design principles. It's not enough to just choose one idea without any reasoning. Re-designing in quick successions and combining a collection of idea is a much more collaborative process and leads to more engagement in teamwork. In project work, I became aware that having members with complementary skills is an efficient way of making forward progress. In my instance, my teammates' research and coding skills combined with my design and video editing skills benefited both of us. We were able to focus on areas that we had expertise in and get work done on time without having to learn on the spot.

3. Appendix

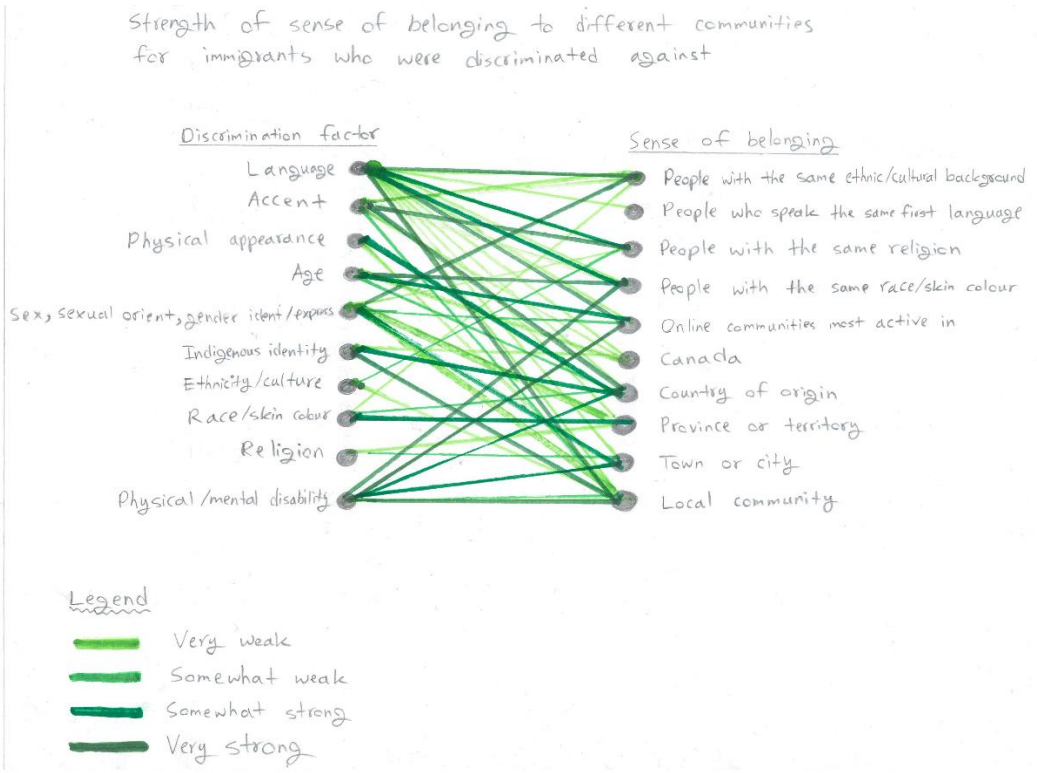
- Fig. 1



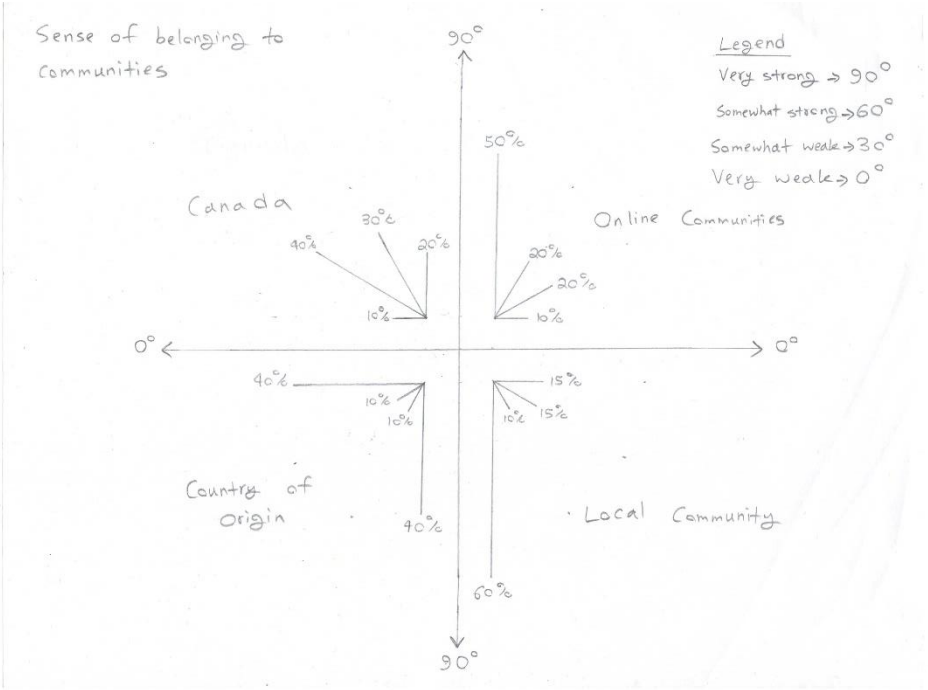
- Fig. 2



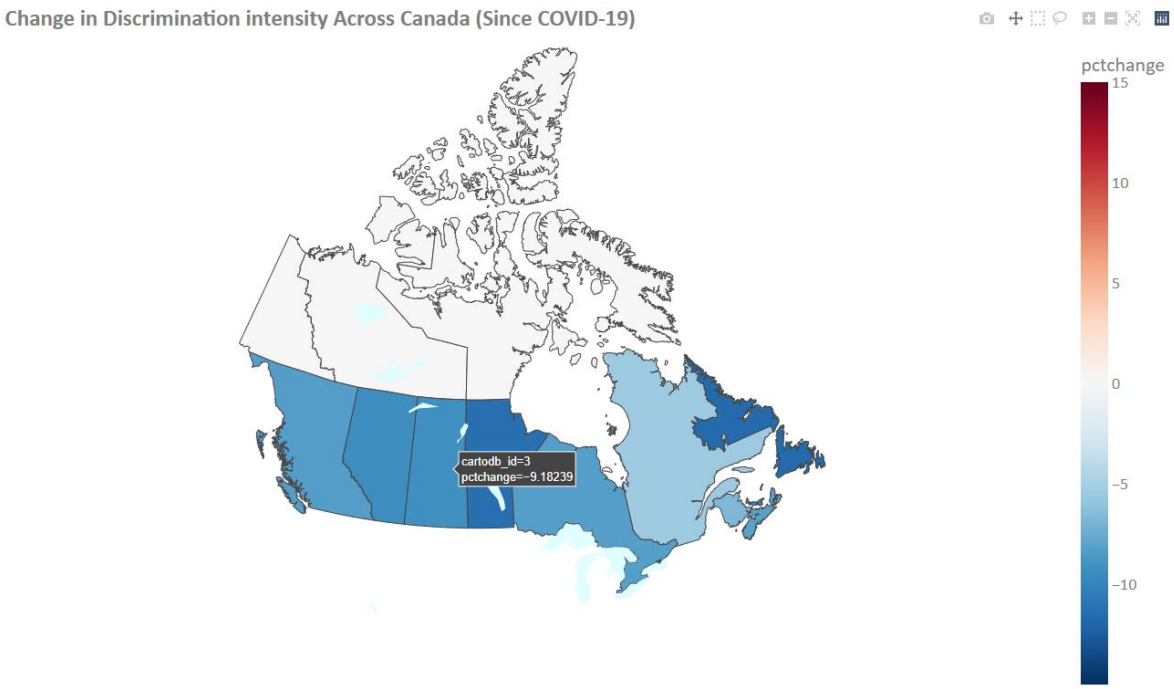
- Fig. 3


Strength of sense of belonging to different communities for immigrants who were discriminated against
Discrimination factor
Language
Accent
Physical appearance
Age
Sex, sexual orient, gender ident/express
Indigenous identity
Ethnicity/culture
Race/skin colour
Religion
Physical/mental disability
Sense of belonging
People with the same ethnic/cultural background
People who speak the same first language
People with the same religion
People with the same race/skin colour
Online communities most active in
Canada
Country of origin
Province or territory
Town or city
Local community
Legend
Very weak
Somewhat weak
Somewhat strong
Very strong

- Fig. 4


Sense of belonging to communities
90°
Legend
Very strong → 90°
Somewhat strong → 60°
Somewhat weak → 30°
Very weak → 0°
50%
Canada
30%
40%
20%
10%
Online Communities
20%
20%
10%
0°
0°
40%
10%
10%
15%
10%
15%
Country of Origin
40%
Local Community
60%
90°

- Fig. 5


Change in Discrimination intensity Across Canada (Since COVID-19)
pctchange
15
10
5
0
−5
−10
cartodb_id=3
pctchange=−9.18239