The impact of factors on strip search and items found in strip search

INF2178_MidtermProject

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1. Introduction

Literature Review

Strip searches are a contentious practice that involves the removal of clothing to inspect an individual's body, which is frequently carried out by law enforcement officials for security reasons. While strip searches are meant to increase security, they can also have negative physical and psychological effects on people, such as anxiety, stress, and humiliation. The impact of strip searches on various groups of people, such as those based on gender and age, has been studied and raised concerns.

The likelihood of being strip searched has been found to be significantly influenced by gender. According to research, women are more likely than men to be strip searched. For example, Johnson, A. N. (2014) discovered that men were more likely than women to be strip searched in a correctional setting. This could be due to gender stereotypes and biases that perceive men to be more likely to be carrying contraband on their person. According to literature review, younger people are more likely to be strip searched than older people. For example, Hales, G. (2022) discovered that young people aged 18 to 24 were more likely than older people to be strip searched in a criminal justice setting. This could be because people believe that younger people are more likely to engage in criminal activity.

From a sociological perspective, we are interested in examining the impact of gender and age on people's strip searches and actions and search reasons on the items found.

Research Objective and Questions

This project aims to investigate how gender and age affect people's being strip searched. These questions were developed based on the knowledge gained from our literature review and preliminary analysis of the dataset (see the below Descriptive Statistics and T-Tests section for the exploratory data analysis).

- RQ1: How sex and age affect people's being strip searched? Do people being strip searched (outcome variable) differ by age and different age group?
- RQ2: How does the actions of the people at arrest and the reason they were searched for affect the chance of finding items in the strip search? People with what kind of actions at arrest are more likely to have items found (outcome variable) in the strip search? What kind of reasons for strip search will be more likely to have items found in the strip search?

2. Exploratory Data Analysis

Descriptive Statistics

The "Arrests and Strip Searches (RBDC-ARR-TBL-001)" dataset includes a total of 65276 records, each of which represents an arrest and/or strip search conducted by the Toronto Police Service. The dataset includes 25 variables related to demographic information, the arrest, and the strip search.

In order to understand the dataset, we produced the following barplot to identify the patterns in the distribution of arrests among different racial groups, different genders and different age groups(Figure1). Unsurprisingly, consistently with what we found from the literature review, males have higher amounts of arrests than females and younger group people have higher amounts of arrests than older group people. It was interesting to note that white people have the highest amount of arrests.

Figure 1

Number of arrests in different race, gender and age group

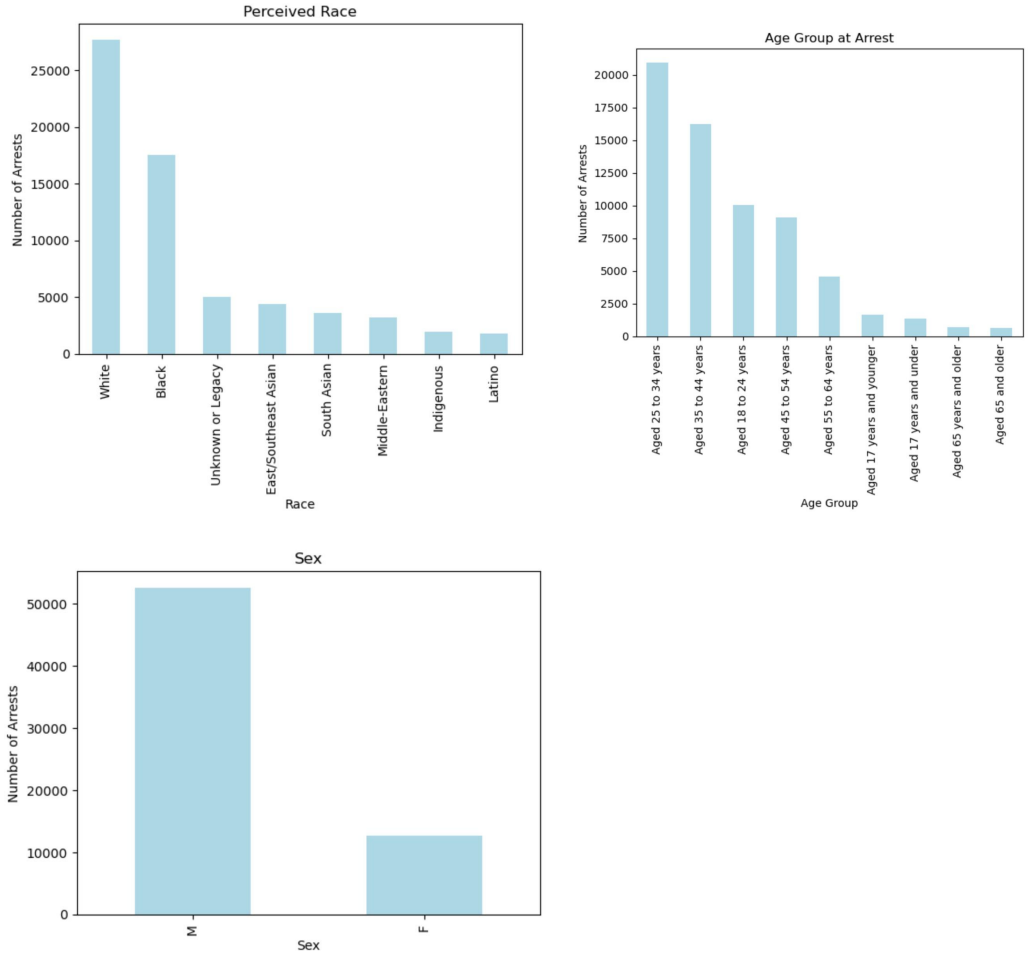


Table 1 displays the descriptive statistics of key variables. Among the data entries, the average stripsearch is 0.119(SD = 0.324). The average is 0.807(SD = 0.395), 0.694(SD=0.461), 0.373(SD=0.484), 0.076(SD=0.265), 0.421(SD=0.494), 0.343(SD=0.475) for sex,age group, items found, actions at arrest with mental instability, actions at arrest with cooperative, search reason of assistant escape respectively.

Table 1

Variables	N	Mean	SD
StripSearch	65267	0.119	0.324
Sex	65267	0.807	0.395
age_arrest_below34	49002	0.694	0.461
ItemsFound	7801	0.373	0.484
Actions_at_arrest___Mental_inst	7801	0.076	0.265
Actions_at_arrest___Cooperative	7801	0.421	0.494
SearchReason_AssistEscape	7801	0.343	0.475

Figure 2

Number of People that were Strip Searched for Each Action at Arrest

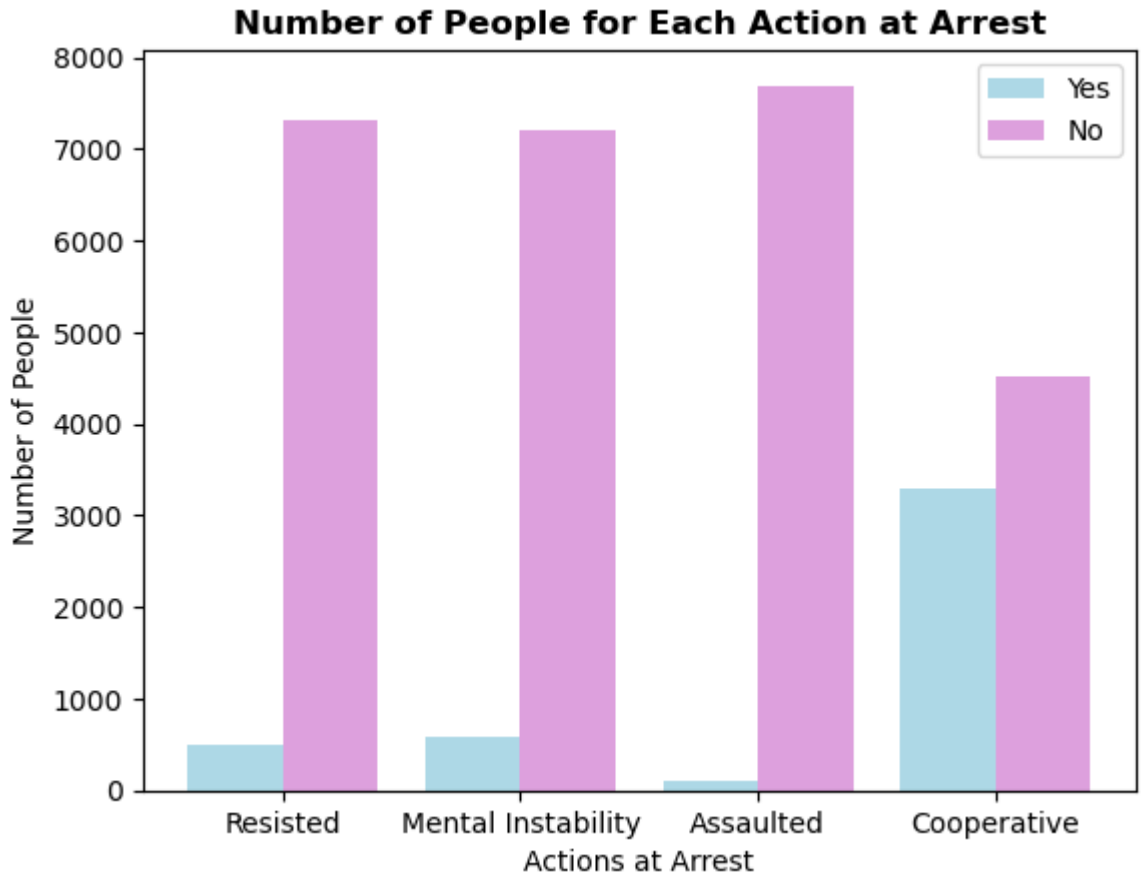


Figure 2. only looks at the people that were strip searched. This figure shows the number of people that conducted each action at arrest and the number of people that did not conduct each action at arrest. The number of people that resisted arrest, showed mental instability, and/or assaulted others at arrest is significantly smaller than the number of people that were cooperative at arrest. Since this plot only considers the ones that were strip searched, an assumption can be derived from this plot: *the majority of the people being strip searched were cooperative at arrest*.

Figure 3

Number of People that were Strip Searched for Each Search Reason

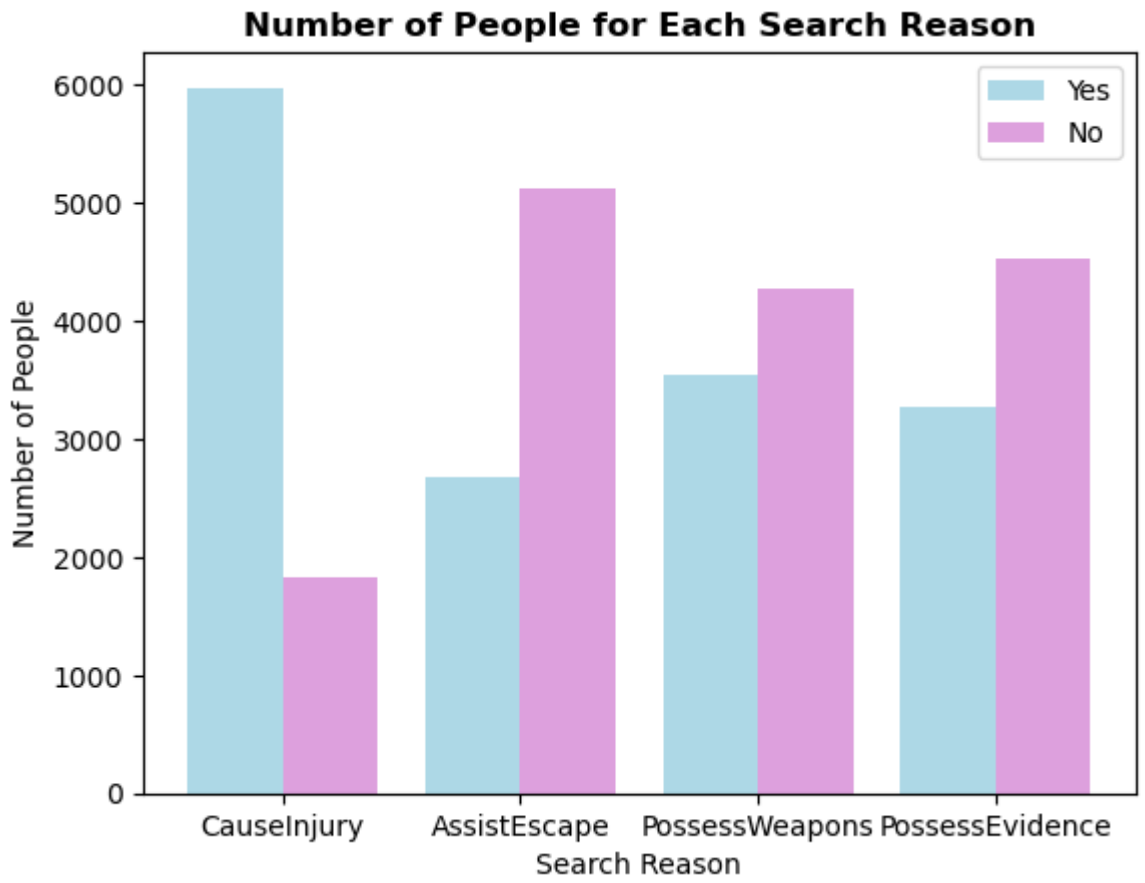


Figure 3. only looks at the people that were strip searched as well. This figure shows the number of people that were strip searched for each search reason and the number of people that were not. The number of people that resisted arrest, showed mental instability, and/or assaulted others at arrest is significantly smaller than the number of people that were cooperative at arrest. Since this plot only considers the ones that were strip searched, an assumption can be derived from this plot: *the majority of the people were strip searched for causing injury*.

T-Tests

Before performing the Welch's t-test on the categorical variables in the dataset, we ensured that the following assumptions were met:

1) A nominal two-level explanatory variable;
2) A quantitative outcome variable;
3) Normality assumption;
4) Independence of errors

After we checked all of the assumptions, we used Welch's T-Test to do further analysis. The following paragraphs summarize some of the most notable results from our t-tests.

Sex and StripSearch

We conducted a Welch's T-Test to analyze whether there was a statistically significant difference between the mean of individuals who undergo strip searches (outcome variable) for males and females (two-level explanatory variable). The following hypotheses are tested:

> Null hypothesis: The population mean of individuals who undergo strip searches is the same for males and females.
>
> Alternative hypothesis: The population mean of individuals who undergo strip searches is different for males and females.

The result indicated that the mean of individuals who undergo strip searches for males (M = 0.123, SD = 0.329) is higher than the mean of individuals who undergo strip searches for females (M = 0.101, SD = 0.302). The p-value is 4.318e-13 which is smaller than 0.05, therefore we have strong evidence to reject the null hypothesis and indicate that there is a difference between males and females of the population mean of individuals who undergo strip searches.

Age group and StripSearch

We conducted a Welch's T-Test to analyze whether there was a statistically significant difference between the mean of individuals who undergo strip searches (outcome variable) for the age of arrested under 34 years and the age of arrested above 34 years (two-level explanatory variable). The following hypotheses are tested:

Null hypothesis: The population mean of individuals who undergo strip searches is the same for the age of arrested under 34 years and above 34 years.

Alternative hypothesis: The population mean of individuals who undergo strip searches is different for the age of arrested under 34 years and above 34 years.

The result indicated that the mean of individuals who undergo strip searches for the age of arrested under 34 years (M = 0.129, SD = 0.335) is higher than the mean of individuals who undergo strip searches for the age of arrested above 34 years (M = 0.087, SD = 0.281). The p-value is 5.73e-47 which is smaller than 0.05, therefore we have strong evidence to reject the null hypothesis and indicate that there is a difference between the age of arrested under 34 years and above 34 years of the population mean of individuals who undergo strip searches.

For RQ2, since the variable of interest (outcome variable) is ItemsFound in strip search, thus we will only be looking at the individuals that had a strip search (StripSearch = 1).

Resisted Arrest and Items Found

We conducted a Welch's T-Test to analyze whether there was a statistically significant difference between the mean of individuals who had items found in the strip search (outcome variable) for people that resisted arrest and people that did not resist arrest (two-level explanatory variable). The following hypotheses are tested:

Null hypothesis: The population mean of individuals who had items found in the strip search is the same between individuals that resisted arrest and individuals that did not resist arrest.

Alternative hypothesis: The population mean of individuals who had items found in the strip search is different between individuals that resisted arrest and individuals that did not resist arrest.

The result indicated that the mean of individuals who had items found in the strip search that resisted arrest (M = 0.366, SD = 0.482) is similar to the mean of individuals who had items found in the strip search that did not resist arrest (M = 0.374, SD = 0.484). The p-value is

0.729 which is greater than 0.05, therefore we have no evidence to reject the null hypothesis, indicating that there is no difference between items found in strip search for individuals that resisted arrest and individuals that did not resist arrest.

Showed Mental Instability at Arrest and Items Found

We conducted a Welch's T-Test to analyze whether there was a statistically significant difference between the mean of individuals who had items found in the strip search (outcome variable) for people that showed mental instability at arrest and people that did not show mental instability at arrest (two-level explanatory variable). The following hypotheses are tested:

> Null hypothesis: The population mean of individuals who had items found in the strip search is the same between individuals that showed mental instability at arrest and individuals that did not show mental instability at arrest.
>
> Alternative hypothesis: The population mean of individuals who had items found in the strip search is different between individuals that showed mental instability at arrest and individuals that did not show mental instability at arrest.

The result indicated that the mean of individuals who had items found in the strip search that showed mental instability at arrest (M = 0.423, SD = 0.494) is greater than the mean of individuals who had items found in the strip search that did not show mental instability at arrest (M = 0.369, SD = 0.483). The p-value is 0.0087 which is smaller than 0.05, therefore we have strong evidence to reject the null hypothesis, indicating that there is a difference between items found in strip search for individuals that showed mental instability at arrest and individuals that did not show mental instability at arrest. From the statistics, it can be seen that it is more likely to find items in a strip search when the individual shows mental instability at arrest.

Assaulted Others at Arrest and Items Found

We conducted a Welch's T-Test to analyze whether there was a statistically significant difference between the mean of individuals who had items found in the strip search (outcome variable) for people that assaulted others at arrest and people that did not assault others at arrest (two-level explanatory variable). The following hypotheses are tested:

Null hypothesis: The population mean of individuals who had items found in the strip search is the same between individuals that assaulted others at arrest and individuals that did not assault others at arrest.

Alternative hypothesis: The population mean of individuals who had items found in the strip search is different between individuals that assaulted others at arrest and individuals that did not assault others at arrest.

The result indicated that the mean of individuals who had items found in the strip search that assaulted others at arrest (M = 0.396, SD = 0.491) is similar to the mean of individuals who had items found in the strip search that did not assault others at arrest (M = 0.373, SD = 0.484). The p-value is 0.610 which is greater than 0.05, therefore we have no evidence to reject the null hypothesis, indicating that there is no difference between items found in strip search for individuals that assaulted others at arrest and individuals that did not assault others at arrest.

Cooperative at Arrest and Items Found

We conducted a Welch's T-Test to analyze whether there was a statistically significant difference between the mean of individuals who had items found in the strip search (outcome variable) for people that were cooperative at arrest and people that were not cooperative at arrest (two-level explanatory variable). The following hypotheses are tested:

Null hypothesis: The population mean of individuals who had items found in the strip search is the same between individuals that were cooperative at arrest and individuals that were not cooperative at arrest.

Alternative hypothesis: The population mean of individuals who had items found in the strip search is different between individuals that were cooperative at arrest and individuals that were not cooperative at arrest.

The result indicated that the mean of individuals who had items found in the strip search that were cooperative at arrest (M = 0.390, SD = 0.488) is greater than the mean of individuals who had items found in the strip search that were not cooperative at arrest (M = 0.361, SD =

0.480). The p-value is 0.010 which is smaller than 0.05, therefore we have evidence to reject the null hypothesis, indicating that there is a difference between items found in strip search for individuals that were cooperative at arrest and individuals that were not cooperative at arrest. From the statistics, it can be seen that it is more likely to find items in a strip search when the individual is cooperative at arrest.

Searched for Causing Injury and Items Found

We conducted a Welch's T-Test to analyze whether there was a statistically significant difference between the mean of individuals who had items found in the strip search (outcome variable) for people that were searched for causing injury and people that were not (two-level explanatory variable). The following hypotheses are tested:

> Null hypothesis: The population mean of individuals who had items found in the strip search is the same between individuals that were searched for causing injury and people that were not.
>
> Alternative hypothesis: The population mean of individuals who had items found in the strip search is different between individuals that were searched for causing injury and people that were not.

The result indicated that the mean of individuals who had items found in the strip search that were searched for causing injury ($M = 0.377$, $SD = 0.485$) is similar to the mean of individuals who had items found in the strip search that were not ($M = 0.362$, $SD = 0.481$). The p-value is 0.243 which is greater than 0.05, therefore we have no evidence to reject the null hypothesis, indicating that there is no difference between items found in strip search for individuals that were searched for causing injury and individuals that were not.

Searched for Assisting Escape and Items Found

We conducted a Welch's T-Test to analyze whether there was a statistically significant difference between the mean of individuals who had items found in the strip search (outcome variable) for people that were searched for assisting escape and people that were not (two-level explanatory variable). The following hypotheses are tested:

Null hypothesis: The population mean of individuals who had items found in the strip search is the same between individuals that were searched for assisting escape and individuals that were not.

Alternative hypothesis: The population mean of individuals who had items found in the strip search is different between individuals that were searched for assisting escape and individuals that were not.

The result indicated that the mean of individuals who had items found in the strip search that were searched for assisting escape (M = 0.414, SD = 0.493) is greater than the mean of individuals who had items found in the strip search that were not (M = 0.352, SD = 0.478). The p-value is 7.626e-08 which is smaller than 0.05, therefore we have strong evidence to reject the null hypothesis, indicating that there is a difference between items found in strip search for individuals that were searched for assisting escape and individuals that were not. From the statistics, it can be seen that it is more likely to find items in a strip search when the individual is being searched for assisting escape.

Searched for Possessing Weapons and Items Found

We conducted a Welch's T-Test to analyze whether there was a statistically significant difference between the mean of individuals who had items found in the strip search (outcome variable) for people that were searched for possessing weapons and people that were not (two-level explanatory variable). The following hypotheses are tested:

Null hypothesis: The population mean of individuals who had items found in the strip search is the same between individuals that were searched for possessing weapons and people that were not.

Alternative hypothesis: The population mean of individuals who had items found in the strip search is different between individuals that were searched for possessing weapons and people that were not.

The result indicated that the mean of individuals who had items found in the strip search that were searched for possessing weapons (M = 0.368, SD = 0.482) is similar to the mean of individuals who had items found in the strip search that were not (M = 0.378, SD = 0.485).

The p-value is 0.350 which is greater than 0.05, therefore we have no evidence to reject the null hypothesis, indicating that there is no difference between items found in strip search for individuals that were searched for possessing weapons and individuals that were not.

Searched for Possessing Weapons and Items Found

We conducted a Welch's T-Test to analyze whether there was a statistically significant difference between the mean of individuals who had items found in the strip search (outcome variable) for people that were searched for possessing crime evidence and people that were not (two-level explanatory variable). The following hypotheses are tested:

> Null hypothesis: The population mean of individuals who had items found in the strip search is the same between individuals that were searched for possessing crime evidence and people that were not.
>
> Alternative hypothesis: The population mean of individuals who had items found in the strip search is different between individuals that were searched for possessing crime evidence and people that were not.

The result indicated that the mean of individuals who had items found in the strip search that were searched for possessing crime evidence (M = 0.374, SD = 0.484) is similar to the mean of individuals who had items found in the strip search that were not (M = 0.372, SD = 0.483). The p-value is 0.350 which is greater than 0.05, therefore we have no evidence to reject the null hypothesis, indicating that there is no difference between items found in strip search for individuals that were searched for possessing crime evidence and individuals that were not.

T-Test concluding remarks

The above t-test results presented some important findings from the dataset. In line with existing literature, we found that the mean of individuals who undergo strip searches were statistically significantly different depending on females and males, age under 34 years and age above 34 years. We had found that males are more likely to be strip searched than females and that people of age under 34 years old are more likely to get strip searched than people of age above 34 years old.We also found that the mean of individuals that had items found in a strip search were statistically significantly different depending on whether or not

the person showed mental instability at arrest, whether or not the person was cooperative at arrest, and whether or not the person's search reason was assisting escape. We found that people that showed mental instability at arrest are more likely to have items found in a strip search than people that did not show mental instability at arrest. People that were cooperative at arrest are more likely to have items found in a strip search than people who were not cooperative at arrest. Lastly, people whose search reason is assisting escape is more likely to have items found in a strip search than people whose search reason is not assisting escape.

3. Methods

Dataset Description

The "Arrests and Strip Searches (RBDC-ARR-TBL-001)" dataset is provided by the Toronto Police Service and contains information on arrests and strip searches conducted by the Toronto Police Service. The dataset contains a total of 65276 records, each of which represents an arrest and/or a strip search conducted by the police. The dataset can be downloaded through the following link: https://data.torontopolice.on.ca/datasets/TorontoPS::arrests-and-strip-searches-rbdc-arr-tbl-001/about. The dataset contains 25 variables including arrest year, arrest month, eventID, arrestID, personID, race, sex, age group, arrest type, the reason for arrest, action at arrested, division, youth at arrest, strip searches, item found. In order to analyze the correlation between age and strip searches by using T-Test and ANOVA , we categorized the 9 groups of different ages into two-level explanatory variables. The group of people's age under 34 years old treated as being strip searched and the group of people's age above 34 years old treated as not being strip searched. Therefore, we conducted the age map to do the further analysis.

The dataset can be used to investigate the impact of various factors on the experience of strip searches, such as gender and age, and to identify potential issues related to bias, discrimination, or misuse of strip searches. The findings of this analysis can help inform policy and practice regarding arrests and strip searches, ensuring that these practices are fair and respectful.

ANOVA tests

To determine whether there is a significant interaction between two independent variable in RQ1, we conducted the two-way anova and state the hypothesis as following:

> Null hypothesis(1): There is no significant difference in the mean number of strip searches performed between males and females.
>
> Alternative hypothesis(1): There is significant difference in the mean number of strip searches performed between males and females.
>
> Null hypothesis(2): There is no significant difference in the mean number of strip searches performed between different age groups.
>
> Alternative hypothesis(2): There is significant difference in the mean number of strip searches performed between different age groups.
>
> Null hypothesis(3): There is no two way interaction among the two explanatory variables.
>
> Alternative hypothesis(3): There is two way interaction among the two explanatory variables.

From the Two-Way ANOVA results table below we could note that for the null hypothesis(1) the p-value is 1.78e-11 which is smaller than 0.05, therefore we have strong evidence to reject the null hypothesis and indicate that there is a significant difference in the mean number of strip searches performed between males and females. For the null hypothesis(2) the p-value is 3.80e-43 which is smaller than 0.05, therefore we have strong evidence to reject the null hypothesis and indicate that there is a significant difference in the mean number of strip searches performed between different age groups. For the null hypothesis(3) the p-value is 0.732 which is greater than 0.05, therefore we fail to reject the null hypothesis and indicate that there is no two way interaction among the two explanatory variables.

RQ1 Two-Way ANOVA results

Variables	sum_sq	df	F	PR(>F)
C(Sex)	4.629689	1.0	45.224266	1.78E-11
C(age_arret_below34)	19.452216	1.0	190.015397	3.80E-43
C(Sex):C(age_arrest_below34)	0.012004	1.0	0.117259	7.32E-01
Residual	5016.01299	48998.0	NaN	NaN

To determine whether there is a significant interaction between three independent variable in RQ2, we conducted the three-way anova and state the hypothesis as following:

Null hypothesis(1): There is no significant difference in the mean of items found in strip search between individuals that showed mental instability at arrest and individuals that did not show mental instability at arrest.

Alternative hypothesis(1): There is significant difference in the mean of items found in strip search between individuals that showed mental instability at arrest and individuals that did not show mental instability at arrest.

Null hypothesis(2): There is no significant difference in the mean of items found in strip search between individuals that were cooperative at arrest and individuals that were not cooperative at arrest.

Alternative hypothesis(2): There is significant difference in the mean of items found in strip search between individuals that were cooperative at arrest and individuals that were not cooperative at arrest.

Null hypothesis(3): There is no significant difference in the mean of items found in strip search between individuals whose search reason was assisting escape and individuals whose search reason was not assisting escape.

Alternative hypothesis(3): There is no significant difference in the mean of items found in strip search between individuals whose search reason was assisting escape and individuals whose search reason was not assisting escape..

Null hypothesis(4): There is no two way interaction between whether or not the person showed mental instability at arrest and whether or not the person was cooperative at arrest.

Alternative hypothesis(4): There is a two way interaction between whether or not the person showed mental instability at arrest and whether or not the person was cooperative at arrest.

Null hypothesis(5): There is no two way interaction between whether or not the person showed mental instability at arrest and whether or not the person's search reason was assisting escape.

Alternative hypothesis(5): There is a two way interaction between whether or not the person showed mental instability at arrest and whether or not the person's search reason was assisting escape.

Null hypothesis(6): There is no two way interaction between whether or not the person was cooperative at arrest and whether or not the person's search reason was assisting escape.

Alternative hypothesis(6): There is a two way interaction between whether or not the person was cooperative at arrest and whether or not the person's search reason was assisting escape.

Null hypothesis(7): There is no three way interaction among the three explanatory variables.

Alternative hypothesis(7): There is a three way interaction among the three explanatory variables.

From the Three-Way ANOVA results table below we could note that for the null hypothesis(1) the p-value is 2.486e-03 which is smaller than 0.05, therefore we have strong evidence to reject the null hypothesis, indicating that there is a significant difference in the mean of items found in strip search between individuals that did and did not show mental instability at arrest. For the null hypothesis(2) the p-value is 2.291e-03 which is smaller than 0.05, therefore we have strong evidence to reject the null hypothesis, indicating that there is a significant difference in the mean of items found in strip search between individuals that were and were not cooperative at arrest. For the null hypothesis(3) the p-value is 1.898e-08 which is smaller than 0.05, therefore we have strong evidence to reject the null hypothesis, indicating that there is significant difference in the mean of items found in strip search between individuals whose search reason was and was not assisting escape. For the null hypothesis(4) the p-value is 0.682 which is greater than 0.05, therefore we have no evidence to reject the null hypothesis, indicating that there is no two way interaction between whether or not the individual showed mental instability at arrest and whether or not the individual was cooperative at arrest. For the null hypothesis(5) the p-value is 0.363 which is greater than 0.05, therefore we have no evidence to reject the null hypothesis, indicating that there is no two way interaction between whether or not the individual showed mental instability at arrest and whether or not the individual's search reason was assisting escape. For the null hypothesis(6) the p-value is 2.293e-03 which is smaller than 0.05, therefore we have strong evidence to reject the null hypothesis, indicating that there is a two way interaction between whether or not the individual was cooperative at arrest and whether or not the individual's search reason was assisting escape . For the null hypothesis(7) the p-value is 5.315e-02 which is greater than 0.05, therefore we have no evidence to reject the null hypothesis, indicating that there is no three way interaction among the three explanatory variables.

RQ2 Three-Way ANOVA results

Variables	sum_sq	df	F	PR(>F)
C(Actions_at_arrest___Mental_inst)	2.127411	1.0	9.157057	2.49E-03
C(Actions_at_arrest___Cooperative)	2.162189	1.0	9.306752	2.29E-03
C(SearchReason_AssistEscape)	7.356041	1.0	31.662751	1.90E-08
C(Actions_at_arrest___Mental_inst):C(Actions_at_arrest___Cooperative)	0.038956	1.0	0.167679	6.82E-01
C(Actions_at_arrest___Mental_inst):C(SearchReason_AssistEscape)	0.191935	1.0	0.826152	3.63E-01
C(Actions_at_arrest___Cooperative):C(SearchReason_AssistEscape)	2.161835	1.0	9.305231	2.29E-03
C(Actions_at_arrest___Mental_inst):C(Actions_at_arrest___Cooperative):C(SearchReason_AssistEscape)	0.868988	1.0	3.740403	5.31E-02
Residual	1810.50678	7793.0	NaN	NaN

Post-hoc tests

To determine which gender and age groups are significantly different from others in terms of the individuals being strip searched or not. A post-hoc test was conducted after a Two-way ANOVA and Tukey HSD is used to compare between groups for the RQ1 as following:

RQ1 Multiple Comparisons of Means - Tukey HSD

Dependent Variable: StripSearch

group 1	group 2	meandiff	p-adj	lower	upper	reject
F	M	0.0221	-0.0	0.0158	0.0284	TRUE
Age above 34 years	Age under 34 years	0.0423	0.0	0.0349	0.0498	TRUE

* The mean difference is significant at the 0.05 level

From RQ1 Multiple Comparisons of Means - Tukey HSD table, we could note that the mean of females and males are significantly different from each other, also the mean of age above 34 years and under 34 years are significantly different from each other. We have evidence to reject the null hypothesis and indicate that the differences between each group are significantly different.

To determine which actions at arrest and search reasons are significantly different from others in terms of the items found in strip search. A post-hoc test was conducted after a Three-way ANOVA and Tukey HSD is used to compare between groups for the RQ2 as following:

RQ2 Multiple Comparisons of Means - Tukey HSD

Dependent Variable: ItemsFound

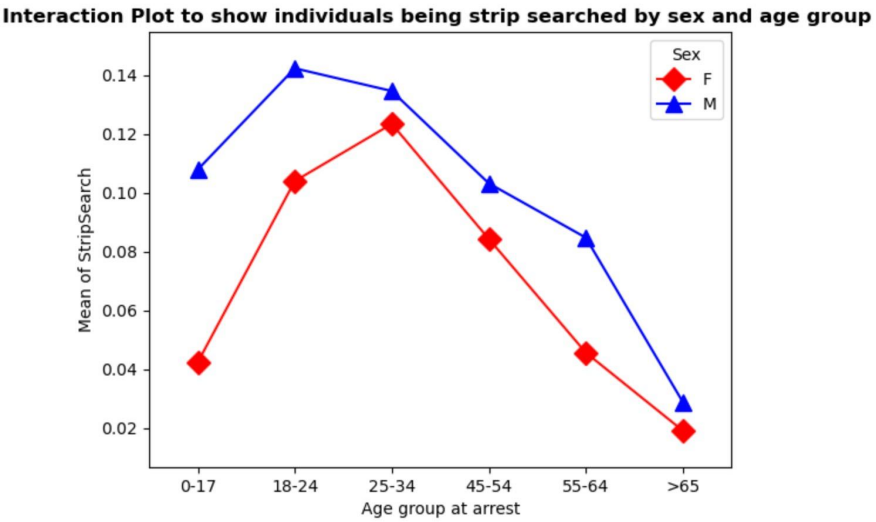
group 1	group 2	meandiff	p-adj	lower	upper	reject
Mentally Stable	Mentally Instable	0.0542	0.0087	0.0137	0.0947	TRUE
Not Cooperative	Cooperative	0.0286	0.01	0.0068	0.0503	TRUE
Not Searched for Assisting Escape	Searched for Assisting Escape	0.0626	0.0	0.04	0.0852	TRUE

* The mean difference is significant at the 0.05 level

From RQ2 Multiple Comparisons of Means - Tukey HSD table, we could note that the mean of whether or not the individual showed mental instability at arrest, whether or not the individual was cooperative at arrest, and whether or not the individual's search reason was assisting escape are significantly different from each other. From the results of the Tukey HSD Table, we can see that we have evidence to reject the null hypothesis, indicating that the differences between each group are significantly different.

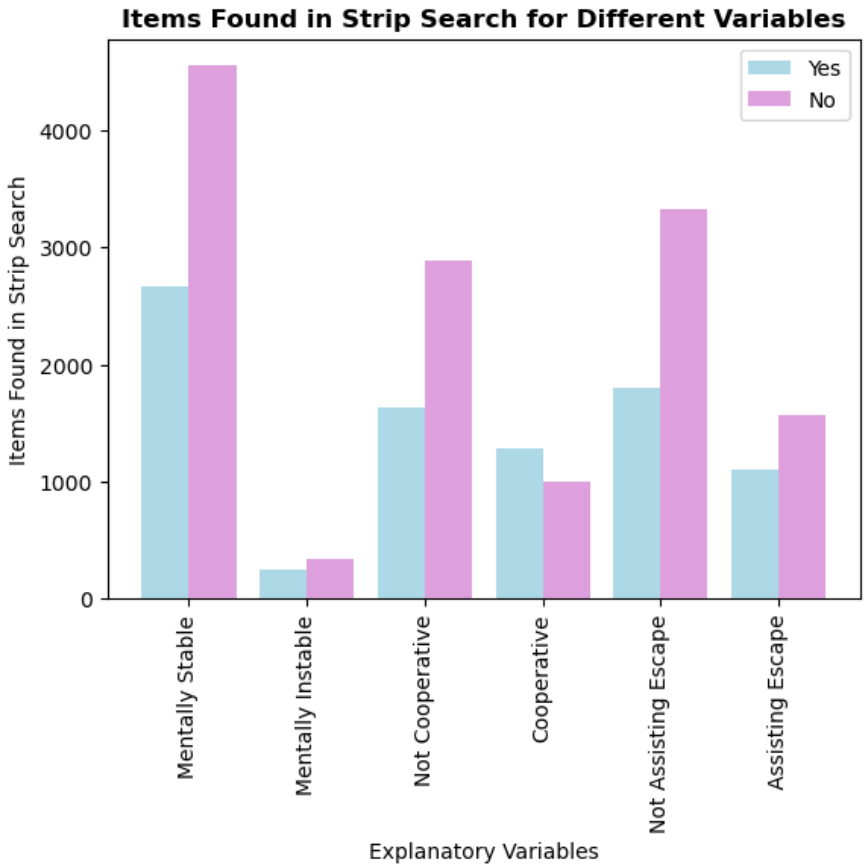
4. Results and Findings

In RQ1, we found that there is a significant difference in the mean number of strip searches performed between males and females. There is a significant difference in the mean number of strip searches performed between different age groups. There is no two way interaction among the two explanatory variables. We also have the interaction plots show individuals being strip searched by sex and age group.



This plot shows: (1)Males have a higher mean of being strip searched than females. (2) The age between 18-34 years have a higher mean of being strip searched than other age groups and the age above 65 years have the lowest mean of being strip searched. (3) There was a noticeable big difference between males and females in the 0-17 years age group.

In RQ2, we found that there is a significant difference in the mean of items found in strip search between individuals that did and did not show mental instability at arrest. It is statistically more likely to find items in a strip search when the individual shows mental instability at arrest. We also found that there is a significant difference in the mean of items found in strip search between individuals that were and were not cooperative at arrest. It is statistically more likely to find items in a strip search when the individual is cooperative at arrest. The third finding was that there is a significant difference in the mean of items found in strip search between individuals whose search reason was and was not assisting escape. It is statistically more likely to find items in a strip search when the individual's search reason is assisting escape.



This plot shows: (1) Number of individuals that had items found in the strip search and the number of individuals that did not have items found in the strip search is significantly different when the individual did not show mental instability at arrest, whereas the number of individuals that had items found in the strip search and the number of individuals that did not have items found in the strip search is similar when the individual showed mental instability at arrest. (2) Number of individuals that had items found in the strip search is lower than the number of individuals that did not have items found in the strip search when the individual was not cooperative at arrest, whereas the number of individuals that had items found in the strip search is higher than the number of individuals that did not have items found in the strip search when the individual was cooperative at arrest. (3) Number of individuals that had items found in the strip search and the number of individuals that did not have items found in the strip search is significantly different when the individual's search reason was not assisting escape, whereas the number of individuals that had items found in the strip search and the number of individuals that did not have items found in the strip search is similar when the individual's search reason is assisting escape.

5. Discussion and Conclusion

The two research questions aim to examine the impact of sex and age groups on the individuals being strip searched or not and the impact of actions and search reasons on the items found. There are some limitations of this project findings. The most important aspect is the inequality in our group-level data. The unequal sample size will reduce statistical power or robustness to unequal variance. RQ1 showed that there is no interaction between two explanatory variables. RQ2 also showed that there is no interaction between the three explanatory variables.

In conclusion, based on the Two-Way ANOVA tests in RQ1, we found the means of at least one group is different from the others regarding the individuals being strip searched or not. The mean number of strip searches performed by males and females differs significantly. The mean number of strip searches performed by different age groups differs significantly. There is no interaction between the two explanatory variables. In addition, the mean of being strip searched for males were significantly higher than those for females, while the mean of being strip searched in the arrest age under 34 years are higher than above 34 years. These findings suggested that both factors are important predictors of the strip searches. Based on the Three-Way ANOVA test in RQ2, we found that (1)the mean of items found in strip search differs between individuals that did and did not show mental instability at arrest. (2)The mean of items found in strip search differs between individuals that were and were not cooperative at arrest. (3)The mean of items found in strip search differs between individuals whose search reason was and was not assisting escape. (4)There is a two way interaction between whether the individual showed mental instability at arrest and whether the individual's search reason was assisting escape.

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