The Association Between Whether it is Daytime or Nighttime and Probability of Vehicle Search among Legal Driving Age Adults across Race, Sex, and Age

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Introduction

- Certain demographics are more likely to be searched no matter the time of day, for instance, young Black males are searched at consistently higher rates than young White males and older Black males (Rosenfeld, Rojek, & Decker, 2012).

- Nighttime drivers are more likely to be searched than daytime drivers (Pickerill, Mosher, & Pratt, 2009).

- Current limited research indicates that specifically in the nighttime, demographics like gender and race themselves are not significant factors in whether drivers are searched (Ritter, 2017).

- It is not clear whether there is an association between whether it is daytime or nighttime and whether a driver is searched across demographics being held constant, like race, age, and sex.

Methods

Sample

- The sample, which is also the population if every traffic stop was recorded, included 313,346 observations of traffic stops in Connecticut in 2022, collected by The Connecticut Racial Profiling Project.

- The race/ethnicity of the observations were based on the perception of the officers in the traffic stop.

Measures

- To determine if it is nighttime or not, sunrise and sunset data was taken from https://www.timeanddate.com/sun/usa/hartford to check the specific dates' sunrise and sunset times, then comparing with each traffic stop's intervention date time.

- To match racial breakdown in prior research literature, including but not limited to Connecticut Racial Profiling Prohibition Project's study, race and ethnicity have been collapsed to just races of White, Black, Asian/Pacific Islander, Indian America/Alaskan Native, Hispanic, and Middle Eastern.

Research Question

Does the association between probability of vehicle search and whether it is daytime or nighttime differ for drivers of different ages, sex, and races?

Results

Univariate

- 1.693% of traffic stops resulted in a vehicle search.

- The racial breakdown of drivers is 59.3% White, 19.2% Black, 17.0% Hispanic, 2.2% Asian/Pacific Islander, 1.3% Indian America/Native Alaskan, and 1.0% Middle Eastern.

- The sex breakdown of drivers is 62.8% Male and 37.2% Female

Bivariate

- Chi-Square analysis revealed that the proportion of vehicles searched and whether it is nighttime or daytime were significantly associated, X2 = 961.67, df = 1, p < 2.2e-16.

- Chi-Square analysis revealed that the proportion of vehicles searched and the sex of the driver were significantly associated, X2 = 695.62, df = 1, p < 2.2e-16.

- Chi-Square analysis revealed that the proportion of vehicles searched and the race of the driver were significantly associated, X2 = 1915.6, df = 5, p < 2.2e-16. Post hoc comparisons revealed no significant differences between drivers of race pairs: Asian/Pacific Islander and Indian American/Alaskan Native, Black and Middle East, and Indian American/Alaskan Native and White. This indicates similar proportions of vehicles searched. There are significant differences for the rest of the comparisons between races.

Multivariate

- Controlling for age, race, and time of day, interaction between the proportion of vehicles searched and sex of the driver was still found to be significantly associated with whether it is daytime or nighttime.

- During the daytime, the proportion of vehicles searched for male drivers is 154% higher than that for female drivers, while it is 101% higher during the nighttime.
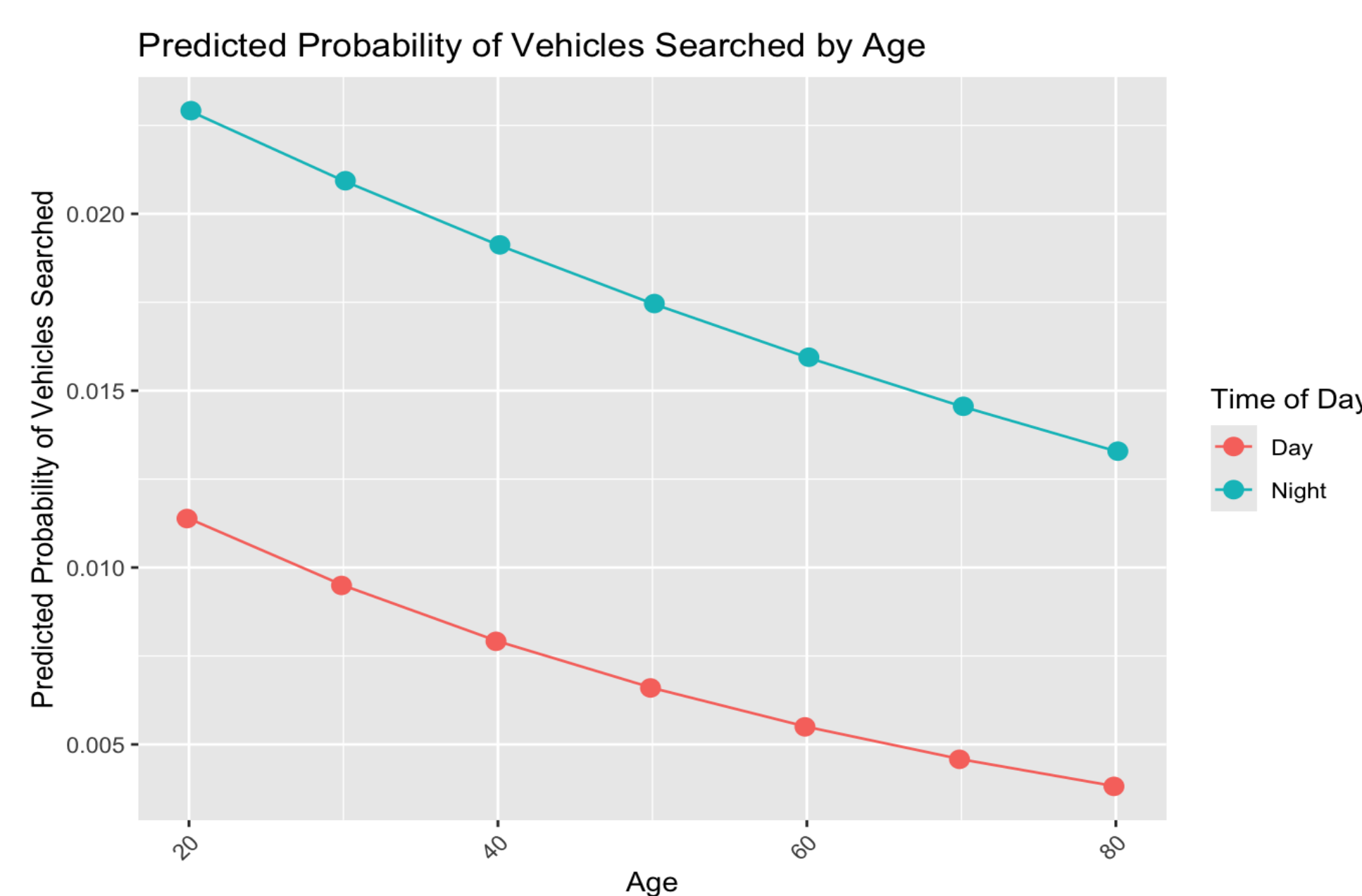

Figure 1. Predicted probabilities of Vehicles Searched by Age and Daytime or Nighttime

- The interaction between age and whether it is daytime or nighttime was statistically significant when predicting probabilities of vehicle search.

- For drivers aged 20, the predicted probabilities of vehicle search is 101% higher during nighttime compared to daytime. For drivers aged 80, it is 248% higher.
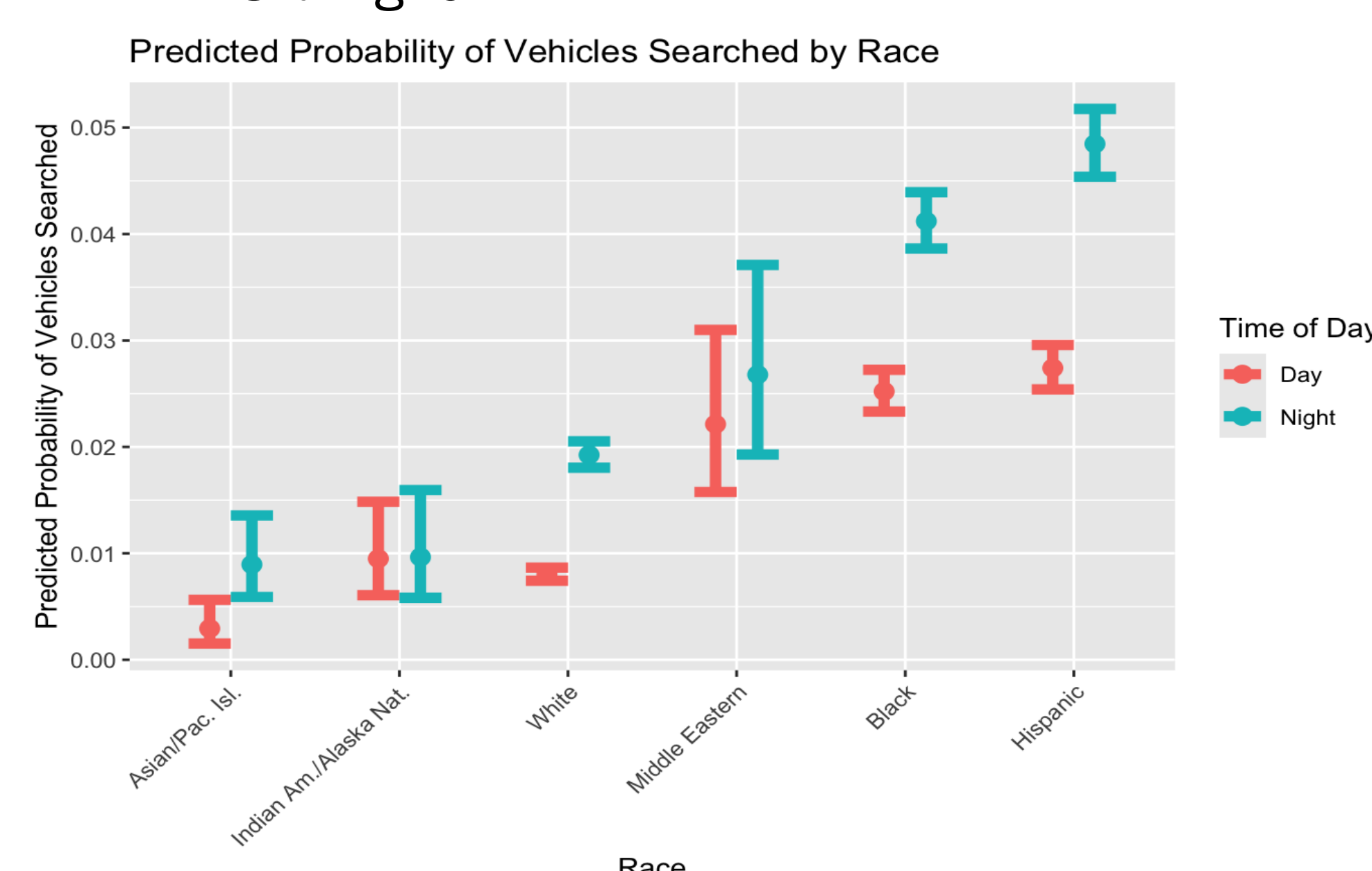

Figure 2: Predicted probabilities of Vehicles Searched by Race and Daytime or Nighttime

- The interaction between race and whether it is daytime or nighttime was statistically significant when predicting probability of vehicle search.

- For Indian American/Alaskan Native and Middle Eastern drivers, the change in the predicted probability of vehicle search is not statistically significant, whereas it is for Asian/Pacific Islander, White, Black, and Hispanic drivers, with the largest increase of 140% being seen for White drivers.

Discussion

- The increase in predicted probability of vehicles searched during the nighttime compared to during the daytime is greater for older drivers compared to younger drivers, not considering sex and race.

- The increase in predicted probability of vehicles searched during the nighttime compared to during the daytime is greatest for White (140%), Hispanic (77%), and Black (63%) drivers, while controlling for age and not considering sex.

- Age, sex, and race are all individually moderating variables for the relationship between whether it is daytime or nighttime and predicted probability of vehicles searched.

- Further research is needed to determine whether police officers' perception of variables like age and sex affect the predicted probability of vehicles searched, since this study and dataset uses age and sex that the officer knows for certain from the drivers' produced ID, whereas perception could possibly have different results.

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