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Research Review on Statistical Discrimination in Law Enforcement

In 2005 Ambrose Leunga, Frances Woolley, Richard E. Tremblay, and Frank Vitaro performed a statistical analysis on the influence of group characteristics on arrest and conviction probabilities, testing to see if the police overuse personal information on individuals when investigating criminal activity. The cross-section of demographics and law enforcement was and remains a central point of scholarly and societal inquiry. Historically, men, those of African descent, aboriginals, the economically disadvantaged, and the mentally ill have higher rates of conviction than their counterparts. In the 1993 case, Whren v. United States, a police officer stopped a vehicle with two African American males after, Whren and Brown, they had turned and sped away without signaling. The men were found to be in possession of two bags of crack cocaine. They tried to argue that there was no legal provocation that should have allowed the officer to stop them and that he was just profiling the defendants and attributing it to erratic driving. The court sided against Whren and Brown and provided a legal precedent for profiling as a means of policing. The economic argument is that statistically discriminating based on the true criminality levels of populations of a specific feature will be right on average and aid in minimizing the cost of policing and investigation, creating societal efficiency. If the police truly only use pure statistical discrimination, it is still of concern to weigh its efficacy against the moral and ethical costs of unwarranted searches and detainments. Additionally, profiling can create a self-fulfilling prophecy and some groups are more costly to prosecute, specifically the more affluent, creating asymmetric outcomes for individuals of equal crime.

The data used within this research is survey data of Montréal youths, self-reporting delinquent behavior, court appearances, and acquisition of a delinquency record. After cleaning, the data contained 639 observations of youths in 1995 who, at age 6, lived in lower-income

regions of Montréal. This data was fairly homogeneous in regards to race, sex, and to a lesser extent, income, meaning these factors could not be used when creating the model. However, the model used schooling, employment, family type, gang membership, delinquent siblings, delinquent friends, criminal associates, and parental characteristics such as employment status and welfare receipt. The sample within this data was found to be fairly representative of the Canadian population in regards to family characteristics, which is crucial for the interpretation and generalization of found results. The initial statistical discrimination model of a given police officer was, in general:

$$y = q + u \quad (1)$$

Where y is a vector of evidence linking an individual to a crime, q is their true level of criminality which is unknown to the police, and u is an error term. This model is then used to derive the expected value of an individual's criminality, q, given the vector of evidence, y:

$$E(q|y) = (1 - \gamma)\alpha + \gamma y \quad (2)$$

Where α is the average value of q for a population and γ is an indicator of the reliability of evidence, in effect the correlation between evidence and delinquency. Therefore, if the true levels of criminality are known, γ is equal to 1, and the expected value of q is then equal to the vector of evidence and group characteristics should have no additional. However, this only holds if you assume that police have perfect information and that groups are similar in all respects except levels of criminal activity and do not have different costs and benefits of searching for or prosecuting criminal activity. However, there is no reason to assume the police are working with perfectly accurate population information and hysteresis is of concern as groups who have historically been prosecuted at higher levels will continue to be profiled and prosecuted at higher levels, since the data suggests they act in higher levels of criminality, creating a self-perpetuating

prophecy. Additionally, as aforementioned, some groups are more costly to prosecute, suggesting even if the police tried to use pure statistical analysis, the differential enforcement costs would make conviction rates an imperfect signal of α, the average level of criminality of a population, leading q to be a function of group characteristics instead of solely the vector of evidence. The final concern with the original model is taking into account the severity of the crime, all else being equal, one would expect the police to investigate and prosecute more egregious crimes at higher levels than petty misdemeanors.

This motivated the use of the Montréal data set to create three logit models to predict the probability of showing up in court: the first is regressed solely on the self-reported delinquency error, the second is regressed only on the personal and familial characteristics gathered, and the third is regressed on all three. The first regression is prompted by the idea that if police are equally effective at catching all criminals, then the best predictor for court appearances or attainment of a delinquency record would be self-reported delinquent behavior. The research reports the summary statistics of both the model and the marginal effects of the characteristics. From the first regression on only self-reported delinquencies, smaller crimes such as hemp use and alcohol consumption were mostly found to not be statistically significant at predicting court appearances, and those that were benefited the individual and suggested they were less likely to appear in court. In contrast, more violent crimes such as destroying family members' belongings and theft were highly indicative of the individual appearing in court. This helps affirm the previous belief that the police prosecute crimes of differing severity at disparate intensities. In the second regression, characteristics used were those plausibly attributable to the probability of committing a crime and characteristics that would be observable by police. These include individual characteristics such as staying in school or having a job, familial characteristics such

as family type, parental age, and income, and association with other delinquents. The marginal effects of the second regression suggest that characteristics such as being in school, having a job, and having older parents hurt the probability of appearing in court while characteristics such as single-parent households, delinquent associates, and history of court appearances increased the probability. This suggests that police do treat students and drop-outs differently when enforcing the law. In the third regression, when controlling for delinquent behavior, schooling and other individual characteristics still have a significant independent effect on the probability of making a court appearance. However, if practicing pure statistical analysis, after controlling for delinquencies one would expect the independent effects of the additional characteristics to have no contribution to the likelihood of making a court appearance, which suggests that the police are overusing specific individual and familial characteristics as signals of criminal behavior. Thus, the Montréal data set viewed under these three distinct logit models not only illuminates the intricate relationship between self-reported delinquency and law enforcement's response but also sets the stage for a deeper examination of the concerns arising from current policing practices.

In conclusion, this study's findings underscore a normative concern within law enforcement practices: the disproportionate weight placed on individual background characteristics over self-reported delinquency. This highlights the potential overreliance on individual and familial attributes as indicators of criminal behavior and raises ethical questions regarding the impartiality of policing strategies. The instituted methods demonstrate that even after accounting for self-reported delinquent actions, individual traits such as educational status and family dynamics continue to significantly influence the likelihood of legal entanglements. By bearing these disparities and their implications, the study contributes to the ongoing discourse

on justice and equality in law enforcement, urging a critical reassessment of practices that may inadvertently perpetuate societal biases.