Using Predictive Policing Cautiously

In the movie, *Minority Report* (2002), the Precrime unit can arrest criminals before they commit a crime. They use the vision of three Precogs who can predict the future through dreams of actual future crimes. The system works, and not a single murder occurs since it is enacted (Spielberg, 2002). Similar ideas called predictive policing are already taken into effect. Predictive policing relies on algorithms given data from the past to identify potential hotspots and high-risk persons. In *Minority Report* (2002), it is later revealed that the Precogs lack consistent judgment of the future. In addition, the system had been built under great sacrifice (Spielberg, 2002). This should be a lesson that society should learn from — that predictive policing is not a magical tool that can eliminate crime. This paper will explore the usage of algorithm-based prediction in law enforcement in the United States. To avoid the marginalized population being adversely affected by algorithms learning from inaccurate and misleading data, predictive policing should be used supplementarily and only when data transparency is ensured.

Definition and Types of Predictive Policing

The idea behind predictive policing is to move from reaction-based to precaution-based law enforcement. The term is used to describe systems that rely on algorithms to predict future crimes (Sheehey, 2018) in two ways, which Richardson et al. describe as “place-based” and “person-based” (2019). The place-based system focuses on mapping crime hot spots based on previous arrest records and other information provided by the police (Barrett, 2016). This includes PredPol, a system that can predict crime risks on areas “as small as 500 by 500 feet” (Taylor, 2020) that was used by the LAPD (Sheehey, 2018). On the other hand, the person-based system predicts the likelihood of a person to be involved in a crime, both as a perpetrator and as

a victim (Sheehey, 2018). The most popular form of this is Chicago's Strategic Subjects List (SSL) (Sheehey, 2018). According to Sheehey, predictive policing software was already used in twenty-five police departments in the United States as of 2018 (Sheehey, 2018). While both PredPol and SSL focus on reducing street crime, this is not the only area that it shows potential. Predictive policing is an attractive system in the area of pretrial release and the prediction of domestic violence — both of which require significant improvements to the current systems.

Usage of Predictive Policing

Domestic Violence

According to the London School of Economics and Political Science (2020), the usage of algorithm-based risk assessment in domestic violence has intrigued researchers because domestic violence is often a recurring form of abuse. Thus, the police need to be able to detect victims at higher risks in the future (London School of Economics and Political Science, 2020). Jeffrey Grogger, professor of urban policy at the University of Chicago's Harris School of Public Policy, Dr. Ivandić, and Tom Kirchmaier, director of the CEP's policing and crime research group, found that by using algorithms based on data such as "criminal convictions, incidents of violence or the number of calls made to the police about domestic abuse", the negative prediction rate, which is currently at 11.5% using traditional questionnaires, could be reduced to 6.1% (London School of Economics and Political Science, 2020). This is not the only way that predictive policing could help domestic violence victims. Data can also be used to make more informed decisions about which offenders should be released before the formal hearing (Berk et al., 2016). As misjudgments regarding pretrial release can have grave consequences that could lead to murder, the negative prediction rate must be minimized (Berk et al., 2016).

Pretrial Release

The usage of algorithms in the pretrial context is not limited to cases of domestic violence. Because the pretrial release is considered a predictive task (Barabas et al., 2018), being able to use algorithms to predict those who are a higher risk to society or have a greater risk of escaping would help improve the system in general (Berk et al., 2016). While letting higher-risk individuals on the loose could lead to a serious threat to society, it is also true that holding people unnecessarily without proper reason could cause significant consequences to their future (Berk et al., 2016). Currently, the ability to afford cash bail is the primary factor affecting who will be released or not (Barabas et al., 2018). By using algorithms to perform a more risk-based risk assessment, the pretrial release could become fairer. Unfortunately, this is not the case, as the data that the algorithm used is fundamentally flawed. While pretrial risk assessment relies on "historical records of arrest, charges, convictions, and sentences to generate predictions" (Minow et al., 2019), those records are often racially biased and tend to be from the perspective of a "white male population" (Barabas et al., 2018, p.65).

Challenges of Predictive Policing

Racism in Police Records

Despite its popularity in law enforcement, human rights experts including the United Nations Committee on the Elimination of Racial Discrimination show concern over the usage of big data and Artificial Intelligence. They believe that it has the potential to "reinforce already existing biases and lead to more discriminatory practices" (Cumming-bruce, 2020). This occurs because police records, which are what the algorithms use to make predictions, are not an accurate representation of actual criminal activities. The reality is that no more than half of violent criminals are arrested (Minow et al., 2019), and arrest records include those who were wrongly arrested (Minow et al., 2019). This disproportionately affects the black population.

According to Minow et al. (2019), at age 27, African-Americans are 235% more likely to be arrested for marijuana than. However, usage rates do not significantly differ (Minow et al., 2019). In addition, an analysis conducted by The L.A. Times found that the LAPD pulled over 27% of black drivers in a city where only 9% of the population was black (Poston & Chang, 2019). Unfortunately, the lack of correlation between the number of crimes and arrests is not the only issue that police-owned data has.

Inaccurate Data

Human error and forgery can also jeopardize the accuracy of police data. According to Richardson et al. (2019), over a hundred retired NYPD captains as well as higher-ranking officers admitted that they have manipulated crime statistics (Richardson et al., 2019). To meet quotas and to give the impression of community control, they would tamper with evidence or falsify records to increase the number of street arrests (Richardson et al., 2019). On the other hand, serious crimes were artificially reduced by convincing people not to file reports so that they could avoid reporting them to the FBI (Richardson, 2019). The LAPD had also been caught for misreporting 14,000 serious assaults as minor offenses from 2005 to 2012 (Richardson, 2019). This may not have been an issue if these data were corrected before using it for predictive policing. However, Richardson et al. (2019) have discovered that in Chicago, dirty data was being used for predictive policing.

Racism Enhanced

The concern shared by human rights experts is not just hypothetical. ProPublica analyzed COMPAS (Correctional Offender Management Profiling for Alternative Sanctions), which is a person-based predictive policing software that predicts recidivism rates of an individual (Angwin et al., 2016). After examining 10,000 criminal defendants in Florida, they found that black

defendants had a 77% greater chance of being marked as high-risk persons who would commit a crime in the future. This was after fixing criminal history and recidivism, age, and gender (Angwin et al., 2016). They also found that COMPAS overestimated the predicted recidivism rate of black defendants while the white defendants who were labeled as lower risk, had a higher rate of re-offending in reality (Angwin et al., 2016). Hamilton also found that the system affected Hispanics in similar ways (2018), indicating that predictive policing gives more power to the majority groups (Barrett, 2016).

Even location-based systems such as PredPol, which intuitively seem less invasive, have been subject to criticism. The issue with systems like PredPol is that it creates a "self-perpetuating feedback loop" (Barrett, 2016, p.337). Google's failure with Google Flu Trends in the past illustrates what this looks like. Google Flue Trends was an algorithm to predict influenza cases based on people's flu-related searches (Lum & Isaac, 2016). After it missed the 2009 flu pandemic, it constantly over-predicted flu cases between 2011 to 2014 (Lum & Isaac, 2016). It became apparent later that Google's new recommendation system was suggesting flu-related words to healthy people. Because of these recommended searches, people started searching for flu-related terms even without symptoms. (Lum & Isaac, 2016). Location-based predictive has the potential to go down the same road. By relying on systems like PredPol, police departments will begin to station more police in areas where the system predicted a higher crime rate. This would lead to more arrests, and the algorithm learns from this new information. This is how the feedback loop works. Even worse, the original criminal data is flawed, and non-white communities tend to have a higher arrest rate (Taylor, 2020) regardless of the number of criminal activities. Even location-based systems can be racist. For this reason, Santa Cruz became the first

to ban the usage of PredPol in 2020 as they believe it targets non-whites disproportionately (Asher-Schapiro, 2020).

How to Approach Predictive Policing

Data Transparency

Given the severe negative impact that the system could have on society, increased transparency in data collection methods and usage of personal information is vital. Predictive policing itself has the potential to improve law enforcement if used properly. The system is supposed to promote safety. However, without more transparency, the public will not feel safe at all. For example, in the pretrial context discussed earlier, "defendants are typically not entitled to access the calculations or input data that were used to calculate the final tabulations" (Barabas et al., 2018). If the information on what the estimation is even based on is not disclosed, the defendant has no reason to feel satisfied with the pretrial risk assessment results. In addition, in a municipality in Denmark where algorithms were used to predict children's risks of abuse, the government faced criticism because the citizens were never asked for their consent (Mchangama & Liu, 2018). Chicago Police's "heat list" of individuals at high risk to be involved in a crime (as a perpetrator or a victim) was also created without any further warnings. The Chicago Police Department paid Robert McDaniel, a 22-year-old black man, an unannounced visit telling him not to commit any further crimes (Lum & Isaac, 2017). However, McDaniel had no prior criminal record (Lum & Isaac, 2016). Algorithms are already ambiguous by nature (Sheehey, 2018). Therefore, consent plays an important role. There should be higher transparency as to what information is being used and how. This is especially true as it could put those who are already vulnerable, in a weaker position. Richardson et al. (2019) explain that groups who do are

not comfortable with the police tend not to report crimes — if this happens consistently, the system will continue to make them more vulnerable.

Using Predictive Policing Supplementarily

The issue arises when predictive policing is used as the only tool. In the 1970s, the introduction of regression modeling, an early form of prediction-oriented policing was introduced, incarceration rates skyrocketed as "policies shifted away from rehabilitative interventions to more administrative approaches" (Barabas, et al., 2018, p.64). A similar situation can happen with predictive policing. The emphasis could shift from finding ways to provide rehabilitation opportunities, to focusing on the numbers and data. There is also automation bias, where people tend to regard automated decisions as more reliable than decisions that they made (Barrett, 2016), which could especially be alarming when pretrial or court decisions are made. The algorithms developed for predictive policing could be beneficial if done carefully. It could benefit society if it served as a tool to understand why it might be the case that certain districts or individuals are labeled as higher risk it could potentially even help uncover implicit racism ingrained in society, and help law enforcement move forward.

Conclusion

In *Minority Report*, the seemingly "perfect" system was built with significant violations of human rights. Anderton later finds out that the Precogs were children of mothers who were addicted to an early version of the neuron. One of the mothers, Anne Lively, wanted to have her daughter back — but the system only worked if her daughter was there (Spielberg, 2020). Anne was murdered in the end. Without the sacrifice of her life and the dehumanization of the Precogs, this system would not have existed. The algorithm-based predictive policing emerging today also has its consequences. Without proper cautioning, it could even change someone's life entirely.

One minor criminal record, or even a wrongful arrest, could mean that they have to live as a "high-risk" individual, monitored carefully by the police. Blind reliance on this technology could be detrimental, but with greater transparency and proper use as a supplementary tool, it has the potential to improve the current police system.

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