Bias in Policing:
Predictive Policing Advocates and Opposition in the U.S

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As predictive policing technologies have been adopted by law enforcement in recent decades, the risk for discrimination has caused concerns. Training data can embed bias, which the algorithm then encodes Courtland (2018). Because algorithms are no more free of bias than the societies that develop them, they do not absolve humans of responsibility for their consequences. With the battles for social justice growing around the world, and with concerns for prejudice against minorities, came an understanding of discriminatory systems. While these issues have stayed relevant over the past decades, concerns relating to the bias have been clouded by a believed increase in safety provided by these systems (Aguirre et al., 2019).

Concerns with predictive policing have been growing in recent years as studies have shown that omission of data relating to one's race does not remove embedded biases (Courtland, 2018; Chouldechova, 2017). These studies have lead to research into these technologies, and whether these biases increase discrimination in minority communites.

The adoption of predictive policing technologies has changed how law enforcement agencies operate. This has caused a disconnect between citizens, separating those who believe that this technology is a net benefit and provides higher safety, and those who believe it infringes on the rights of the citizens that it is supposedly protecting. Those who believe this technology is dangerous believe that police departments are capable of operating at a high enough level without biased technologies (Puente, 2019; Shapiro 2017). The supporters of this technology point out that as innovations are made there will always be changes in society, and that citizens deserve to have the highest safety possible (Pearsall, 2010).

While the debate rages on, law enforcement agencies have been able to increase usage of these technologies, and in some cases, lower crime rates in the process (Aguirre et al., 2019). This has happened primarily unchecked as these technologies have not existed long enough to have extensive legislation passed. To avoid rapid legislation some departments have kept their practices private from the public (Stein, 2020).

As citizens argue, the companies who develop these technologies are trying to maintain their ability to stay unregulated. The companies creating these systems have fought to show the algorithm's ability to help police departments lower crime rates (Moravec, 2019). Their primary goal is to maximize market share and by having less regulations they are able to operate more efficiently. This is why these companies are trying to prove their legality, and lack of inherent bias. As these companies have tried to minimize discrimination and maximize safety, the Algorithmic Justice League is fighting to show the inherent biases in these technologies to increase regulations.

The algorithmic justice league is a group that aims to raise awareness of the effect of artificial intelligence (AI). The Algorithmic Justice League outlines a goal to "illuminate the social implications and harms of artificial intelligence." With this goal they have gone on to raise awareness for embedded biases in technology by giving numerous talks, and raising issues throughout governing bodies even reaching out to congress Chouldechova (2017).

As these debates have escalated over recent years numerous law groups, and governing bodies have become interested and have sought to create laws and legal precedents. These law groups and governing bodies have the goal of creating the highest safety possible for all people. With these goals in mind these groups have pushed through the court systems, and through

legislative bodies to create changes and generate support for their causes, often releasing public statements and documenting their success.

As these issues continue to be discussed, there is a central question of who is responsible for the discrimination and its effects. The embedded bias of these systems, and the consequences they have on the communities they are used in, have become known through research (Perry et al., 2013; Vlahos, 2012; Chouldechova, 2017). Court cases about these predictive policing issues bring police departments usage of this technology under a microscope. Some cases setting precedents for how information on predictive policing techniques is managed and distributed (*Brennan Center v. NYPD,* 2017), while others are setting precedents for the actual usage of these technologies and raising concerns for the racial biases in law enforcement practices (*United States of America v. Billy Curry, Jr.*, 2020). With these court cases being ruled in favor of the law groups pushing for regulations, law enforcement agencies are changing their practices, and face requirements to show more about how these technologies are being used.

Some believe the companies that create these systems are what require regulations, as opposed to the police departments using their technology. As one article made clear, predictive policing technologies take away police officers' ability to make their own decisions when they are told to patrol areas based on these algorithms Shapiro (2017) . Given the fact that these technologies are majorly unregulated, the companies who produced them have no legal consequences when they provide false assumptions. In a lot of cases the way these algorithms make decisions are not disclosed, and therefore withhold information from the departments using this technology and the citizens being policed by it. Some local governments are taking issue with this, and are not allowing spending for this technology, and in some cases outright banning usages of predictive policing Asher-Schapiro (2020).

Where the blame lies will become a large part of discussions around predictive policing reform. These decisions will lead to pressure on either the police departments who employ the technology or the companies producing these systems, and in the process potentially lower the responsibility for whichever one is not found culpable.

How laws are enforced is a constantly adapting process. With these adaptations there are polarizing results, as there is a desire for increased safety but a concern for over policing or discrimination. These discussions about predictive policing will help shape our law enforcement practices, and our treatment of minorities for years to come.

Review of Research

Researchers have studied how predictive policing models are influenced by the datasets they are trained on (Perry et al., 2013; Vlahos, 2012; Chouldechova, 2017). They have demonstrated that the programs inevitably encode social biases. Predictive policing must therefore be regulated, but there is no agreement about the kind or extent of regulation necessary.

Researchers have also studied means of improving predictive policing's safety and efficacy (Aguirre et al., 2019; Duursma & Karlsrud, 2018; Richardson et al., 2020; Sandhu & Fussey 2021; Shapiro 2017). They have been unable to demonstrate a decrease in crime rates in all cases. This raises the question about whether these systems can help police districts. With this concern growing there is more uncertainty of whether this technology has a place in society.

Immediate Groups

According to Perry et al, (2013), predictive policing can improve law enforcement efficacy. Police departments generally oppose restriction of predictive policing. To avoid

regulation of their practices, some police departments keep them out of public view. According to Cahn and Sherman (2021) some departments have evaded regulation of their predictive policing practices this way.

Members of police forces do disagree about the need for predictive policing. Some believe it will lead to a lower skill requirement to become a police officer (Puente, 2019; Shapiro 2017). With this comes a fear that there will be too much dependence on these technologies going forward. Others believe that predictive policing does make a difference, believing that using this technology helps prevent crimes, and in some cases helps solve crimes that have already occured (Aguirre et al., 2019; Duursma & Karlsrud, 2018; Richardson et al., 2020; Sandhu & Fussey 2021). When this technology was first emerging some leaders were excited over what it could offer. In 2009 the chief of the Los Angeles Department, Charlie Beck, stated predictive police can help "effectively deploy resources in front of crime, thereby changing outcomes" as stated by Pearsall (2010). While these debates play a role in decisions, it comes down to local governments and the police departments to decide if they will adopt these technologies, and how intensively they use them. A big component in this will be how police officers, and their unions, choose to respond to usage and regulations of these technologies.

Critics of predictive policing have used litigation to limit its application. Predictive policing companies defend their product. Predpol, a predictive policing company, opposes regulation and contends its product is safe and nondiscriminatory. Josh Rubenstein, the CEO of PredPol, claims that because his company's product uses no demographic characteristics, it neither violates civil rights nor perpetuates racism (Rubenstein, qtd. in Moravec, 2019). On their own website, Predpol released its patented algorithm to support its claim that it is free of bias.

Citizens who have been directly affected by predictive policing are raising awareness of these issues. One method being seen is citizens starting petitions against practices used by their sheriff's office to raise awareness about these practices (Guariglia 2021; *10 Tampa Bay* 2021). Other citizens who feel they have been discriminated against have lead walks in New Orleans to expose usages of this technology. These exposures have lead to new policies being drawn up to create change in the usage of these technologies and limit discrimination Sinders (2021).

Legal Groups

Legal groups become a dominant factor in these discussions. Advocates of regulation have turned to the courts, and require support from lawyers and legislators to help them in their cause. In 2016 the Brennan Center for Justice, a bipartisan nonprofit at New York University Law School, sued the New York Police Department to compel it to disclose its predictive policing methods (*Brennan Center v. NYPD,* 2017). The court ruled that NYPD must make its predictive policing records public. Along with this case setting precedents for how information pertaining to predictive policing is released to the public, there are cases that are challenging the use of predictive policing. Epic (2020) cited a case coming out of Richmond Virginia as a potential road bump in predictive policing. In this case judges on a federal appeals court were ruling on usage of predictive policing stating this technology "has been shown to be, at best, of questionable effectiveness, and at worst, deeply flawed" (*United States of America v. Billy Curry, Jr.*, 2020). These court decisions can have an effect in future usages of these technologies, with growing concerns of these systems legality and capability to help prevent crimes.

Along with these court cases civil rights groups are organizing to create change and help minorities. One example of this was a statement released by 17 civil rights organizations,

including the American Civil Liberties Union (ACLU) and the National Association for the Advancement of Colored People (NAACP). In this statement they outline 6 areas for concerns largely pointing out lack of transparency and reinforcing racial biases (ACLU, 2016; Moravec, 2019).

One of the more important groups in the legislative battle are the officials and councils in charge of creating regulations. Counties across the U.S. have shown their ability to allow for these technologies to be used, and for them to be regulated. Some directors are dissuaded by the technology because they do not know how it works. The deputy director of the department of Office of Data Analysis, Research and Evaluation said "I'm very against using government money for black-box solutions where I can't tell my community what we're doing" Courtland (2018). Oakland and San Francisco have banned facial recognition technology. In 2020 Santa Cruz became the first city to ban predictive policing Asher-Schapiro (2020). This is not the case across the country, in some counties there are no regulations in place and police departments are free to spend their budget accordingly. Bonner (2021) wrote about Worcester Massachusetts and their police department. The Police department took advantage of a lack of regulations and increased usage of predictive policing. With this they agreed to 2 years with an average yearly cost of 175,000 dollars. The city is still able to put in regulations the department will have to follow, which could lead to a limited usage of technology worth almost 400,000 dollars.

Third Party Groups

Software developers have used data analytics to argue both for and against predictive policing. Aguirre et al. (2019) found that after Richmond adopted predictive policing, murders fell 32 percent, and rape fell 20. With this research comes data driven arguments claiming that

there is no discernible change in biased arrests when this technology compared to control groups (Brantinghamet et al. 2018). With these statistics there are some groups lobbying to utilize the tools. One example of this is the High-level Independent Panel on Peace Operations (HIPPO), an independent group finding emerging needs in peacekeeping for the U.N., favors predictive policing. One emerging need identified is the strengthening of analytical technology United Nations (2015). They have since urged the U.N. to start adopting these technologies with these data points supporting their argument. This is not to say that this is fully accepted to be true. There are numerous researchers coming out stating that these technologies do not have the ability to help. In a RAND Corporation study, Shapiro (2017) found "no statistical evidence that crime was reduced more" in study districts with predictive policing "than in the control districts." Other studies have been able to show a clear racial discrimination in these technologies creating groups of people that are found to be race driven, even when racial factors are not given to these algorithms (Courtland, 2018; Chouldechova, 2017).

Buolamwini (2019), a critic of predictive policing and the leader of the Algorithmic Justice League, is developing a scorecard to evaluate bias in such systems. The Algorithmic Justice League is also giving numerous talks, including a ted talk garnering over a million views, giving stories of how artificial intelligence has the ability to discriminate against citizens (Buolwamini 2016). By conducting research on these technologies that primarily pertain to minorities, they are able to generate a grassroots campaign to help produce change with the usage of predictive policing. The Algorithmic Justice League (2021) has made a point that reaching the public is a huge part of their mission. They require a high level of exposure and donations to be able to create the changes they believe are necessary with the usage of AI.

Police Department Response

Ferguson (2021) stated that police departments in major cities were the first to adopt these technologies, as they were where predictive policing should have had the greatest impact. In recent years they have decided, or in some cases been required, to roll back the usage of these technologies Asher-Schapiro (2020). Miller (2020) wrote about the Los Angeles Police Department (LAPD) and their decision to stop using predictive policing technology and the departments belief the funding could be used in better ways. While the New Orleans Police Department (NOPD) and New York Police Department (NYPD) are rolling back their usage of the technology to in accordance with recent laws passed, although the NYPD exposed issues in the now publicly available data creating a cry for greater changes in their usage of the technology (Stein, 2020, Sinders, 2021). Small towns have been able to avoid regulations, and have a distinct need of having very few resources. With the ability to better police their districts, and in some cases get better resources, they have readily adopted these technologies to help police their districts. These districts are still susceptible to outcry and the prospect of regulation. A recent example of this is in Pasco Florida, where the local sheriff's office had been using predictive policing to monitor children. By looking at grades and attendance records they believed they could find the students “destined for a life of crime” as stated in the Intelligence Led Policing (ILP) manual. When this information was found out by the public petitions were formed to stop this practice from happening in their communities (Guariglia 2021; *10 Tampa Bay* 2021). Police departments are hoping that by adhering to regulations, and making changes in regards to their jurisdictions' needs they will be able to satisfy supporters and critics of this technology.

Conclusion

Extensive research has shown an inability to remove bias from predictive policing models currently being used by police departments (research citation). The overall effect of these biases can range from either unable to aid in policing all the way to providing data to support discrimination. As citizens, lawmakers, and the police officers who use this technology have learned more about the usage of these systems, debates have emerged to determine proper usage of this technology and just how much regulation is required for it to be acceptable in society. Proponents of predictive policing, critics of the biases in these systems, legal groups that are pushing for and against regulation, third party researchers are analyzing the technology and statistics of predictive police, and police departments, all have a hand in the way predictive policing technology is developed, used, and regulated, as they all push their respective agendas. Citizens who are concerned for discrimintaion in their communities have made their voices heard by protesting this technology, and creating petitions to raise awareness in their communities. As citizens grow more concerned with the safety benefit versus the inherent biases, law groups have been able to push cases and create regulations directly related to predictive policing. Third party research groups are finding data to support arguments both for and against predictive policing, in the safety it can or cannot provide, and in the biases encoded into these systems. Police departments are trying to find a way to use this technology while still obeying the incoming regulations, and maintaining peace in their communities.

With all of these groups pushing at once on the law enforcement of their communities, the entities that control precedents and laws will win out. Police departments are expected to operate within the confines of the law. These regulations will be created in direct correlation with officials voted in. These officials will most likely make their decisions based on the wants of the

groups who voted them in, and in some cases where they believe funding will come from. This means that the groups who are able to vote in officials will be the ones able to push for the highest degree of change. The increase in petitions, protests, and court cases over the usage of this technology have been able to create concern over this technology's place in society. This proves that the power to promote change in law enforcement is still predominantly in the hands of the people, and that with the increase in the ability for information to spread people can cause change more rapidly than ever.

References

ACLU (2016) Statement of Concern About Predictive Policing by ACLU and 16 Civil Rights Privacy, Racial Justice, and Technology Organizations. *American Civil Liberties Union*. https://www.aclu.org/other/statement-concern-about-predictive-policing-aclu-and-16-civil-rights-privacy-racial-justice

Aguirre, K., Badran, E., & Muggah, R. (2019). Annex 1.: Selected applications of predictive policing and evaluation results (FUTURE CRIME:, pp. 12–13). *Igarape Institute*. JSTOR

Algorithmic Justice League (2021) *Algorithmic Justice League* https://www.ajl.org/about

Asher-Schapiro, A. (2020, June 24). California city bans predictive policing in U.S. first. *Reuters*. https://www.reuters.com/article/us-usa-police-tech-trfn-idUSKBN23V2XC

Bonner, M (2021, March 3) Police signed contract for new program a month before Worcester city council review. *Masslive.* https://www.masslive.com/worcester/2021/03/worcester-police-signed-shotspotter-contract-which-includes-predictive-policing-a-month-before-it-reached-city-council-chambers-for-approval.html

Brantingham, P. J., Valasik, M., & Mohler, G. O. (2018). Does Predictive Policing Lead to Biased Arrests? Results From a Randomized Controlled Trial. *Statistics and Public Policy*, *5*(1), 1–6. https://doi.org/10.1080/2330443X.2018.1438940

Brennan Center v. NYPD (2017). Brennan Center for Justice at New York University School of Law v. New York City Police Department and James P. O'Neill. Supreme Court of the State of New York County of New York.

Buolamwini, J. (2019). The Algorithmic Justice League. *Medium.* https://medium.com/mit-media-lab/the-algorithmic-justice-league-3cc4131c5148

Buolamwini, J. (2016). How I'm fighting bias in algorithms https://www.ted.com/talks/joy_buolamwini_how_i_m_fighting_bias_in_algorithms

Cahn, A., & Sherman, J. (2021, February 21). New York City's Surveillance Battle Offers National Lessons. *Wired*. https://www.wired.com/story/opinion-new-york-citys-surveillance-battle-offers-national-lessons/

Chouldechova, A. (2017). Fair prediction with disparate impact: A study of bias in recidivism prediction instruments. *ArXiv:1703.00056 [Cs, Stat]*. http://arxiv.org/abs/1703.00056

Courtland, R. (2018). Bias detectives: The researchers striving to make algorithms fair. *Nature*, *558*(7710), 357–360. https://doi.org/10.1038/d41586-018-05469-3

Duursma, A., & Karlsrud, J. (2018). Predictive peacekeeping: Opportunities and challenges. *Norwegian Institute of International Affairs* (NUPI). JSTOR

Epic (2020, July 16). EPIC - Federal Appeals Court Sounds Alarm Over Predictive Policing. https://epic.org/2020/07/federal-appeals-court-sounds-a.html

Ferguson, A. (2021) Big data policing is coming to small towns. There's a reason big cities rejected it. https://www.newsleader.com/in-depth/opinion/2021/03/22/big-data-policing-coming-your-town-theres-reason-failed-big-cities/4614693001/

Guariglia, M. (2021, March 22). Pasco County's Sheriff Must End Its Targeted Child Harassment Program. *Electronic Frontier Foundation.* https://www.eff.org/deeplinks/2021/03/pasco-countys-sheriff-must-end-its-targeted-child-harassment-program

Miller, L (2020, April 21). LAPD will end controversial program that aimed to predict where crimes would occur. *Los Angeles Times*. https://www.latimes.com/california/story/2020-04-21/lapd-ends-predictive-policing-program

Moravec, S. (2019) Do Algorithms Have a Place in Policing? *The Atlantic*. https://www.theatlantic.com/politics/archive/2019/09/do-algorithms-have-place-policing/596851/

Pearsall, B (2010, June 22) Predictive Policing: The Future of Law Enforcement? *National Institute of Justice.* https://nij.ojp.gov/topics/articles/predictive-policing-future-law-enforcement

Perry, W. L., McInnis, B., Price, C. C., Smith, S. C., & Hollywood, J. S. (2013). Using Predictions to Support Investigations of Potential Offenders. In *Predictive Policing* (pp. 81–114). RAND Corporation.

PredPol (2020). *PredPol*. https://www.predpol.com/about/

Puente, M. (2019, July 3). LAPD pioneered predicting crime with data. Many police don't think it works. *Los Angeles Times*. https://www.latimes.com/local/lanow/la-me-lapd-precision-policing-data-20190703-story.html

Richardson, R., Hurd, W., & Schroeder, C. (2020). Addressing the Harmful Effects of Predictive Analytics Technologies (#Tech2021, pp. 22–24). *German Marshall Fund of the United States*. https://www.jstor.org/stable/resrep28474.11

Sandhu, A., & Fussey, P. (2021). The 'uberization of policing'? How police negotiate and operationalise predictive policing technology. *Policing and Society*, *31*(1), 66–81. https://doi.org/10.1080/10439463.2020.1803315

Shapiro, A. (2017). Reform predictive policing. *Nature News*, *541*(7638), 458. https://doi.org/10.1038/541458a

Sinders, C. (2021, March 26) How Musicians and Sex Workers Beat Facial Recognition in New Orleans. https://www.vice.com/en/article/xgznka/meet-the-musicians-and-strippers-who-beat-facial-recognition-in-new-orleans

Stein, M. I. (2020, December 18). New Orleans City Council bans facial recognition, predictive policing and other surveillance tech. *The Lens*. https://thelensnola.org/2020/12/18/new-orleans-city-council-approves-ban-on-facial-recognition-predictive-policing-and-other-surveillance-tech/

United Nations, Uniting our Strengths for Peace - Politics, Partnership and People : Report of the High-Level Independent Panel on Peace Operations. (2015). https://www.refworld.org/docid/558bb0134.html

United States of America v. Billy Curry, Jr., (2020). United States District Court for the Eastern District of Virginia v. Billy Curry Jr. United States Court of Appeals for the

Vlahos, J. (2012). The Department Of Pre-crime. *Scientific American*, *306*(1), 62–67. JSTOR

10 Tampa Bay (2021, March 11) Pasco County parents sue sheriff's office over "predictive policing" program. *Wtsp.Com*. https://www.wtsp.com/article/news/local/pascocounty/pasco-county-parents-sue-sheriffs-office-predictive-policing-program/67-f65bd93e-307d-465c-a2cb-b63ea458bd21