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APPLYING EXISTING LEGAL FRAMEWORKS TO PREDICTIVE POLICING WITH ARTIFICIAL INTELLIGENCE: GAPS, TENSIONS, AND INDIVIDUAL HARMS

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"Applying existing legal frameworks to predictive policing with artificial intelligence: gaps, tensions, and individual harms"

-- Doctoral Thesis, Kelly Blount

Table of contents

Chapter 1: Introduction 5

A. Introducing Predictive Policing 7

1. What is it? What is it not? 7

2. Clarification of terminology: Distinguished from prevention and investigation 12

3. Risk, predictive policing, and AI 14

i. Transforming the risk society through sophisticated prediction and data 14

ii. Pushing the bounds of prevention and investigation into the preparatory phase 17

4. The policy discussion surrounding predictive policing 19

i. Permissible uses of AI in Europe: courtroom uses versus policing 20

ii. Technology precedes regulation: the U.K. and the U.S. approaches 24

B. Fragmented Legal Framework 29

1. Exploring the laws applicable to predictive policing: data protection, human rights, policing laws 30

2. Examples of legal frameworks of prediction: financial crime monitoring and intelligence for counterintelligence 33

Financial crime 34

Intelligence for countering terrorism 36

C. Methodology: Comparative Analysis 38

1. Exploration of jurisdictions applying aspects of the above frameworks 39

Common law versus civil law approaches to crime control 43

D. Brief chapter outline of thesis 44

2. Police and investigation 44

3. Overlapping frameworks: Due process and the presumption of innocence 45
4. Misaligned thresholds: Triggering rights and quantifying suspicion 45
5. Tensions within the fundamental rights framework: Anti-discrimination and data protection 46
6. Piecing it together: Analysis of 'a predictive policing framework' 46
Chapter 2: Policing, Prevention, and Criminal Investigation 48
A. Introduction 48
B. Police & policing 49
1. Police and policing goals 50
C. Prevention 52
1. Theories and modes of prevention 53
2. Evolution of criminal investigations 55
i. Elements of criminal investigation 59
D. Elements of Predictive Policing and Risk Assessment 61
1. Place-based predictions 64
2. Individual-based predictions 69
E. Artificial intelligence & data 72
1. AI and machine learning 72
2. Implications of data usage 75
F. Conclusion 81
Chapter 3: Overlapping Frameworks: the Presumption of Innocence as a Due Process and Fair Trial Right 83
A. Introduction 83
B. Defining the presumption of innocence 84
1. Putting the presumption into context 88
2. Policing and the 'presumption of guilt' 91
C. Applications and contexts 95
1. Wide interpretation: Case of the European Convention of Human Rights 96
i. ECtHR case law/guidance 96

ii. Mid-level interpretation: Case of the United Kingdom 105
iii. Broad interpretation: Case of France 110
2. Narrow interpretation: Case of the United States *116*
i. Courtroom application of the presumption 117
ii. The presumption beyond the perimeters of the courtroom 121
D. Analysis **123**
E. Conclusion **132**
Chapter 4: Misaligned Thresholds: Triggering Rights and Quantifying Suspicion **134**
A. Introduction **134**
B. Predictive Policing & Suspicion **136**
1. Discretion and suspicion *136*
2. Machine generated suspicion versus manual suspicion *142*
C. Thresholds and legal protections **144**
1. Council of Europe *144*
2. United States *151*
3. United Kingdom *157*
D. 'High crime areas' in practice **162**
1. Are due process standards met? *170*
E. Conclusion **174**
Chapter 5: Tensions within Fundamental Rights Framework **177**
Introduction **177**
I. Discrimination **179**
A. Discriminatory policing and traditional enforcement mechanisms *179*
B. Predictive Policing as a Conduit for Bias *182*
1. 'Bad Data' 184
2. The feedback loop 187
C. Predictive Profiling *188*
1. Profiling and discrimination 189

2. Predictive profiling 191
D. Protections Against Discrimination *193*
1. Case of European Convention on Human Rights 194
2. The Netherlands 202
3. Case of the United Kingdom 209
4. Case of the United States 213
II. Data protection 221
A. Case of the European Union 223
B. Entrenching Data Biases: Case of the United States 235
C. Data for Targeting Biases 238
III. Analysis 241
IV. Conclusion 244
6. Conclusions 246
A. Introduction 246
1. Lacking protections 254
B. Protections in Comparison 258
C. Concluding Reflections 261
Bibliography 265

Chapter 1: Introduction

This thesis addresses the practice of predictive policing as sophisticated by the use of artificial intelligence (AI), and attempts to place it into a legal framework that fully addresses its legal effects on the individual. As predictive policing necessarily sits outside the formal criminal justice structure of law, policing standards do not clearly apply in the intended way. In addition, it is undeniable that it has far-reaching effects on the application of due process and fair trial rights. Similarly, a human rights framework, while applicable, cannot exhaustively ameliorate the harms of predictive policing. Therefore the work of this thesis will be to identify relevant or irrelevant legal standards as traditionally applied to policing, in an attempt to place predictive policing into a coherent legal framework, based on a functional comparative analysis of several jurisdictions. In short, the thesis will aim to propose answers to the following research questions:

- What is the legal framework applicable to the use of predictive policing and its effects on individuals?
    - How does the use of artificial intelligence for predictive policing change the legal effects of the practice on individuals from traditional policing methods?
    - Which regulatory regimes apply to predictive policing and artificial intelligence used for policing?
    - Are the legal frameworks able and sufficient to mitigate potential damages of predictive policing?

In answering these questions, the work will demonstrate that the use of predictive policing, particularly as altered by the use of artificial intelligence, is transversally disruptive to traditional interpretations of fundamental and criminal justice rights regardless of jurisdiction. It

will further argue that not only does no single legal framework address the practice, but that predictive policing and AI together may even exacerbate tensions between rights regimes.

This introductory chapter will provide an overview of predictive policing and how artificial intelligence is used to sophisticate the process. After clarifying the terminology used herein and illustrating the context of a risk society and the evolution of predictive policing as the result of a preference for crime prevention, the applicable legal frameworks will be presented. In addition to presenting the proposed regulatory frameworks for artificial intelligence and criminal justice, the examples of financial crime monitoring and counter intelligence will be suggested as parallel means of compliance- or data- driven predictive enforcement. These examples will act as illustrative of legal frameworks applicable to prevention of harms to be compared and contrasted to predictive policing.

The introduction will then put forth the rationale and approach for the thesis methodology. It will be explained that the use of a functional approach, that is an assessment of the practice of predictive policing across jurisdictions, will inform the legal comparison. It is herein acknowledged that predictive policing is most prominent in the United States and used to a lesser degree throughout Europe where it may soon even be subject to ban, leaving the United Kingdom as mid-range in both use and regulation. Therefore because the thesis will draw concrete, known information about predictive policing from where it is practiced, being a limited number of jurisdictions, the remaining analysis will be done by applying case law to its potential use in systems where it is largely untested.

A. Introducing Predictive Policing

Predictive policing is not a conceptually new form of crime control, however with the advent and evolution of artificial intelligence, its use has grown more intrusive as a means of policing. Despite the effects of predictive policing in the criminal justice system and on individual rights, there has been little jurisprudence on its use. This is true across jurisdictions even though its prevalence varies quite a bit. There is a rich legal scholarship on the use of predictive policing and its perceived effects on rights, however in the absence of case law and regulation, its use remains largely open-ended as to what legal frameworks best apply and where tensions may arise. This section will briefly describe the practice and the infusion of artificial intelligence in its use, as illustrated more fully in Chapter 2, as a basis for the discussion of its legal framing moving forward.

1. What is it? What is it not?

Predictive policing is given numerous competing definitions in the literature. For the purposes of this thesis, predictive policing should be understood as the use of historical and real time data to forecast the risk that a location or individual is likely to be the center of a crime event in order to allow police agencies to choose how to purposefully divert their resources, in lieu of toward some other unidentified threat as a way of preventing said threat from manifesting.[1] The goal of predictive policing is therefore to provide law enforcement agencies the necessary information to prevent crime events, with the long-term goal of lowering crime rates and increasing public safety. Predicting crime is not new to policing, as tracking past crime

[1] Wim Hardyns and Anneleen Rummens, "Predictive Policing as a New Tool for Law Enforcement? Recent Developments and Challenges," *Eur J Crim Policy Res* 24, no. 1 (October 23, 2018): 201–18.; *see also* Fieke Jansen, "Data Driven Policing in the Context of Europe, Working Paper" (DATAJUSTICE, May 7, 2018).; *also* Perry et al., *Predictive Policing*; *also* Guthrie Ferguson, "Policing Predictive Policing" at 1125.

trends to indicate likely trouble areas has always been a method for controlling crime. However the predictive aspect is purportedly more powerful and complicated as a result of sophisticated analytical techniques which is increasingly aided by AI and the proliferation of available data. Proponents of predictive policing justify a reliance on large and diverse data sets to identify patterns and correlate what are perceived as otherwise untraceable characteristics relevant to crimes. It may be posited alternatively, that though myriad data are infused into AI-driven algorithms, the results may not differ significantly from heuristic methods and indeed there is little evidence that predictive policing truly improves policing. Conversely, the ill-effects of predictive policing are well documented, raising questions as to whether the large-scale collection of data is actually necessary and whether 'enhancing' policing with AI is effective and appropriate.

Though crime cannot actually be totally and accurately predicted, predictive policing is justified as a means to supplement the management of police resources by targeting known risks. There are various methods of predictive policing, each predicated on different subjects and levels of analysis.[2] For the purpose of the following analysis, the thesis categorizes the various methods into two broad categories. The categories are assembled according to whether the goal of the prediction is to assess the risk of a crime by location, or as attributed to a potential perpetrator of crime (individual risk). One of the earliest iterations of predictive policing is hotspot analysis, or cluster mapping,[3] interchangeably referred to here as crime mapping.[4] This is the most common form of place-based predictions. It is often most successful for property crimes, as these are

[2] For an accessible discussion on the terminology and differing types of analysis, see United States National Institute of Justice, "Crime Mapping & Analysis Program Extra Reading Material, Intermediate Crime Mapping Using ArcGIS 10.1," May 29, 2016, https://nij.ojp.gov/topics/articles/course-materials-crime-mapping-using-arcgis-101.
[3] Leslie Kennedy, Joel Caplan, and Eric Piza, "Risk Clusters, Hotspots, and Spatial Intelligence: Risk Terrain Modeling as an Algorithm for Police Resource Allocation Strategies," *J Quant Criminol*, 2011, 339–62.
[4] Hardyns and Rummens at 203. *See also* Eck and Weisburd, "Crimes Places in Crime Theory" at 2-3.

crimes of opportunity, usually against strangers and subject to general deterrence, as opposed to violent crime which is often spontaneous or between known individuals, underreported, and therefore less predictable.[5]

The capacity to integrate additional data points into the analysis due to the integration of AI is considered to be an advantage over traditional policing methods and makes predictive policing a potentially powerful and contentious tool. One place-based theory uses environmental factors to predict likely locations for crime to correlate combinations of factors in past crimes to existing environmental factors that may indicate a similar crime is likely to occur at another location.[6] Therefore with large data sets, it is theoretically possible to get a concise view into the "built-in" opportunities for crime that reflect relevant environmental factors, such as broken streetlights or scant security infrastructure.[7] Other prominent theories informing micro-level predictive policing include rational choice theory (one will only commit a crime for which the benefits exceed the costs);[8] routine activity theory (crime is the function of offender, time, and place converging);[9] distance decay theory (most perpetrators will commit crimes at a diminishing

[5] Hardyns and Rummens, "Predictive Policing as a New Tool for Law Enforcement? Recent Developments and Challenges" at 205. *See also*, For a chronology of predictive policing, as well as the progression of its predictive uses, see Ferguson, "Policing Predictive Policing."

[6] Mara Hvistendahl, "Can 'predictive Policing' Prevent Crime before It Happens?," *ScienceMag.Org* (blog), September 28, 2016. See also, Kristian Lum and William Isaac, "To Predict and Serve?," *Significance*, October 7, 2016. at 18.

[7] For a more in-depth discussion of the statistical methods that are used for crime mapping, *see* Perry et al., *Predictive Policing*; also Rohan George, "Predictive Policing: What Is It, How It Works, and Its Legal Implications," *The Centre for Internet & Society Blog* (blog), November 24, 2015.

[8] Eck and Weisburd, "Crimes Places in Crime Theory." *See also* Stephen Jones, *Criminology*, Fourth (Oxford University Press, 2009).

[9] Christopher Koper, "Just Enough Police Presence: Reducing Crime and Disorderly Behavior by Optimizing Patrol Time in Crime Hot Spots," *Justice Quarterly* 12, no. 4 (1995): 649–72. *See also*, Eck and Weisburd, "Crimes Places in Crime Theory." at 5, for a discussion of the three requirements of routine activity theory: motivated offender, desirable target, convergence in time, and absence of guardian. Routine activity theory is similar to crime pattern theory, or environmental criminology, which posits that the distribution and interaction of perpetrators and victims or targets across time and space informs criminal behaviors, s*ee also* Welsh and Farrington, *The Oxford Handbook of Crime Prevention* at 322.

rate as getting further from home or an "anchor point");[10] near-repeat theory (a perpetrator finding a particular location to be a successful target is likely to return to similar targets);[11] and criminality of place (places act as crime attractors, opportunities, or generators).[12] These all refer back to traditional, heuristic methods of solving crime but with the addition of myriad data and AI, predictions are based upon a much wider scope of information, which can be arguably intrusive.

Individual-based predictions are generally less common, with several notable exceptions. Person-based predictions have a more direct nexus to the criminal justice system, doubly affecting individuals' rights. Similarly to place-based predictions which identify the factors that indicate opportunities or generators of crime, individual-based predictions stem from the fact that most crimes are committed by a disproportionately small number of individuals and it aims to target individuals who demonstrate the relevant combination of characteristics relevant to criminal trends.[13] Therefore, by targeting those individuals for deterrence or increased police scrutiny, it may be argued though it is not proven, that crime is more efficiently reduced.[14] These factors often include socio-economic status, demographics, record of previous offenses or

[10] Eck and Weisburd, "Crimes Places in Crime Theory" at 16-19, for a discussion on offender mobility; *see also* Bruce Grierson, "The Hound of the Data Points," *Popular Science*, 2003. at 3-4, for an explanation of the "least effort" principle.
[11] *See* Alvaro Briz-Redon, Francisco Martinez-Ruiz, and Francisco Montes, "Adjusting the Knox Test by Accounting for Spatio-Temporal Crime Risk Heterogeneity to Analyse near-Repeats," *European Journal of Criminology*, n.d. For a distinction between traditional hot spot mapping and the near-repeat principle, *see* David Hatten and Eric L. Piza, "Measuring the Temporal Stability of Near-Repeat Crime Patterns: A Longitudinal Analysis," *Crime & Delinquency*, 2020. For a discussion on the initial finding on repeat victimization, *see also* Bilel Benbouzid, "From Situational Crime Prevention to Predictive Policing," *Abolitionism* XII (2015).
[12] Patricia Brantingham and Brantingham, Paul, "Criminality of Place: Crime Generators and Crime Attractors," *European Journal on Criminal Policy and Research*, no. 3 (January 1995): 5–26. *See also* Eck and Weisburd, "Crimes Places in Crime Theory" for an equivalent discussion on crime pattern theory. For the near-repeat effect based on the flag/boost principle, *see* Briz-Redon, Martinez-Ruiz, and Montes, "Adjusting the Knox Test by Accounting for Spatio-Temporal Crime Risk Heterogeneity to Analyse near-Repeats."
[13] Brayne, "Big Data Surveillance: The Case of Policing" at 986. *See also* Guthrie Ferguson, "Policing Predictive Policing" at 1138.
[14] Martin Bouchard and Aili Malm, "Social Network Analysis and Its Contribution to Research on Crime and Criminal Justice," 2016.

arrests, educational history, marital status, home neighborhood, and employment.[15] History of prior offenses is often the most heavily weighted in this assessment and in some jurisdictions perceived risk of recidivism automatically requires regular interactions with the police. In addition, investigating "negative social networks" may be a way to measure the proximity of the individual to past crimes or known previous offenders.[16] This can be achieved through an adverse social network analysis which detects and interprets "patterns of social ties among actors" for any relevant value.[17] As will be argued in Chapter 5, both place and person based predictive policing amount to a form of preventative profiling, which often rely upon or foster discriminatory policing.

The frequency and variety of predictive policing methods and programs vary widely. This further complicates the ability of assigning a legal framework to the practice, but as is also discussed in the foregoing, there are marked similarities as well. In the case of both place- and person-based predictive policing, similar data sets are relied upon, even if the subject of analysis differs. As will be argued throughout this thesis, the tendency of predictive policing to flatten crime into a probabilistic binary calculation suffers from value attribution and indeed manifests problems inherent in any technology that seeks not only to translate human behavior to statistical calculations, but also predict individual behavior.

[15] Ferguson Guthrie, "Beyond Data-Driven Policing," *American Scientist* 105, no. 6 (n.d.). at 357.
[16] Guthrie Ferguson, "Policing Predictive Policing" at 1142. For a discussion on the Chicago Police Department strategy for creating a list of individuals found to be most at risk, and the relevant modeling/linking strategy, *see* Jessica Saunders, "Predictions Put into Practice: A Quasi-Experimental Evaluation of Chicago's Predictive Policing Pilot," *J Exp Criminol* 12 (2016): 347–71.
[17] van der Hulst, "Introduction to Social Network Analysis (SNA) as an Investigative Tool" at 103.

2. Clarification of terminology: Distinguished from prevention and investigation

The mandate for policing varies across jurisdictions and its component duties may be categorized very differently as a result. Despite this, police share the positive duty to protect individuals from harm, investigate crimes, and maintain public order. Depending on the jurisdiction, the acts of public order maintenance and harm prevention may be one and the same in practice and mandate.[18] Similarly, the investigation of a crime may be triggered at different points relative to a harm and may likewise be executed at the behest of any number of entities; judicial, prosecutorial, or police standing alone.[19] Due to the multi-jurisdictional approach of this thesis and the functional analysis that will follow, it is important to clarify the intended use of several of the key terms used throughout. Unless specified otherwise or qualified to meet the specificities of a jurisdiction, these terms will be as generally construed as follows.

Crime prediction and prevention: The prediction of crime herein refers specifically to the use of sophisticated data mining and analysis to indicate the relative likelihood that a crime will occur. Prediction should be understood as a relative probability, which may or may not be acted upon.[20] The tool most often utilized for predictive policing is the risk assessment. Indicated above, the risk assessment synthesizes large amounts of data to produce a prediction based on correlations between past crime and similar data relative to the present. Predictive policing is distinguished from intelligence-led policing (ILP) in that the strategies and technology used in predictive policing, while at times overlapping with ILP, is a specific form of policing guided by

[18] Jim Murdoch and Ralph Roche, "The European Convention on Human Rights and Policing; A Handbook for Police Officers and Other Law Enforcement Officials" (Council of Europe, December 2013).
[19] Consultative Council of European Prosecutors, "Opinion on the Role of Prosecutors in Criminal Investigations" (Council of Europe, 2015).
[20] The relativity of predictive analyses as it essentially allows for the ranking of risk between places, meaning that risk is high in one place relative to another.

information.[21] Prevention, on the other hand, is a form of proactive crime control that "using different techniques" seeks to "prevent delinquency" via means that include a range of tactics ranging from judicial and legal, to community-led, to more traditional, coercive police actions.[22] For the purposes of the thesis, prevention can therefore be the action taken on the basis of a prediction. Specifically prevention refers to a patrol officer whose role it is to ensure public order and deter crime before it may occur.[23] Prevention is also possible in the absence of a prediction, however most patrols function on experience and knowledge gathered over time and across communities with the goal of thwarting criminal acts before a harm occurs, often relying on the suspicion of an imminent criminal or preparatory act. In short, predictions are a tool and prevention is the act which may be the result of a prediction or totally independent.

Criminal Investigation: Another form of crime control is the investigation. Though it traditionally commences post-crime, its value lies largely in the procurement of evidence on which a prosecution may rest.[24] Therefore it facilitates deterrence, incapacitation, or rehabilitation, and acts to lessen future crime in addition to supporting the goal of justice for the victims of crime. The thesis discusses investigative techniques which may sometimes also be used in the preventative stage, such as forming an anticipatory profile of a crime scene, whereby certain elements of opportunity or risk may theoretically be neutralized as a means of preventing future harms.[25] Other techniques include the use of data collection and mining, which in essence may contribute to future investigations, for the present purpose of preventing such a crime. The acts of prevention and investigation may be distinct, as in many continental systems in which

[21] Nick Tilley, "Modern Approaches to Policing: Community, Problem-Oriented and Intelligence-Led," in *Handbook of Policing* (Routledge, 2008).
[22] Hassan Mohammadi Nevisi, "16 Types of Crime Prevention," *Journal of Forensic Sciences and Criminal Investigation* 11, no. 3 (March 2019).
[23] David Garland, *The Culture of Control* (University of Chicago Press 2001), 171.
[24] Mike Maguire, "Criminal Investigation and Crime Control," in *Handbook of Policing* (Routledge, 2008).
[25] Tim Newburn, "Understanding Investigation," in *Handbook of Criminal Investigation* (Routledge, 2007), 1–10.

police are responsible for public order maintenance and investigations are led by the prosecutor or judiciary. Alternatively the police may play the lead in both respects, as in the United States, blurring police mandates into a shared competence. The collection of data in the preventative stage which may be shared in later investigations additionally complicates the division of competences. As the thesis will explore, sharing techniques across mandates may cause uncertainty as to what legal parameters apply.

3. Risk, predictive policing, and AI

Though the logic of predictive policing is based on older, existing theories, its reach is amplified by the addition of technology, specifically AI. Not only can AI theoretically make risk assessments potentially more useful, it is also an amplifier of possible inaccuracies, biases, and legal uncertainty. Though AI is indeed a tool that may in many contexts be harnessed for collective benefit, this work argues that its use to profile individuals as likely criminals is an inappropriate use and may harm individuals and groups with little proven benefit.

i. Transforming the risk society through sophisticated prediction and data

Risk society is one in which society organizes itself in order to mitigate risk, through an institutionalized approach.[26] Risk is defined as the quantified likelihood that an event will happen, based on combined, perceived or known, relevant factors.[27] It is not the goal of this structure to fully eradicate risk but rather to manage, control, and decrease the probability of

[26] Haggerty and Ericson, *Policing the Risk Society, 86*.
[27] Kennedy, Caplan, and Piza, "Risk Clusters, Hotspots, and Spatial Intelligence: Risk Terrain Modeling as an Algorithm for Police Resource Allocation Strategies." at 343; Hardyns and Rummens, "Predictive Policing as a New Tool for Law Enforcement? Recent Developments and Challenges" at 202; *see also* Perry et al., *Predictive Policing*.

harm to the extent possible[28] by spreading responsibility for prevention across institutions.[29] One such example of governance by institutional risk management is the mitigation of dangers associated with driving.[30] In the absence of completely abstaining from the act of driving, society has structured itself so as to make driving as safe as possible by managing the potential risk factors that create insecurity for users of the road. This requires numerous institutions and regulations that proscribe and enforce certain behaviors. The resulting organization also requires that systems and processes are set in place that ensure the smooth coordination of these networks and the necessary infrastructure.[31] The risk society is therefore above all, a regulatory society.[32] In the realm of predictive policing, risk assessments are ranked to identify 'high' risk subjects (human or geographic) according to the notion that there is inherent risk of crime in society, which can theoretically be prevented if identified in advance. In recent years the concept of the risk society has become a popular justification for crime prevention focused policing.

An efficient risk society also requires that there is an adequate level of knowledge surrounding perceived risks. Adequate information includes knowledge of necessary conditions and prerequisites in which the fruition of a harm is most probable; the kinetics and characteristics of the harm itself; and the effects of the harm on the involved individual, third parties, and society as a whole. In addition, it must be considered that harms affect stake holders differently.[33] Therefore, a significant complication in the risk society is differentiating the ways in which particular factors contribute to any number of outcomes. Without complete knowledge

[28] Valverde and Mopas, "Insecurity and the Dream of Targeted Governance" pp 246.
[29] de Laat, "The Disciplinary Power of Predictive Algorithms: A Foucauldian Perspective" pp 321.
[30] See, Haggerty and Ericson, *Policing the Risk Society, pp 40*. Citing, Garland, *The Culture of Control*. This hypothetical example is one which Haggerty and Ericson use to illustrate the institutionalization of the risk society. This chapter will allude to it several times.
[31] Haggerty and Ericson, *Policing the Risk Society*.
[32] Ulrich Sieber, 'The New Architecture of Security Law - Crime Control in the Global Risk Society'. See also, Haggerty and Ericson, *Policing the Risk Society, pp 48*.
[33] Haggerty and Ericson, *Policing the Risk Society*.

of the potential harm(s), the best way to mitigate the risk is to reduce uncertainty as much as possible.[34] Certainty is best achieved by gathering as much known information about the harm as possible, to mitigate the level of uncertainty as much as possible. Huge amounts of data are required to garner as much information as possible, which must then be analyzed to produce an actionable result. This function is the value added by AI.

To assign a level of risk, which is provided as a numeric probability, it is first necessary to assign value to each of the factors which make the danger more or less likely to occur. Though the numbers themselves are objective, their relative values are attributed by human subjectivity and judgments of one's environment, therefore negating any argument that the technology is neutral. Subjectivity may be the willful or incidental cause of misjudgment of a particular harm, or even ignorance of particular risk factors. Further, crime is a social construct, which we herein attempt to quantify.[35] Therefore 'objective' calculations of risk are actually highly subjective. The thesis will address the complexity of algorithmic derivatives and the lack of understanding in the process of calculating probabilities in the high stake application of policing. As with any probability calculation, assigning risk to the threat of criminal behavior is a complicated process. The harm resulting of criminal behavior can be defined in various ways, each of which may be quantified differently. In addition, the determination must be made whether we consider the criminal act the risk, the criminal behavior as the risk, or the outcome of the behavior as the risk.[36] This is particularly true in the case of preventing an act which has not (and may not)

[34] Pat O'Malley, "Risk and Responsibility," in *Foucault and Political Reason: Liberalism, Neo-Liberalism and Rationalities of Government* (Chicago: Taylor & Francis Group, 1996), 189–207.
[35] Haggerty and Ericson, *Policing the Risk Society*.
[36] Garland, *The Culture of Control,* pp 16. See also, Sieber, "The New Architecture of Security Law - Crime Control in the Global Risk Society."

occur, meaning the factors which will be identified as relevant to crime are themselves not criminal.[37]

To mitigate the risk of crime or harm, police may develop risk profiles for individuals or locations by assembling the known factors about each in order to develop a risk profile that can serve as guide for policing a particular environment. Because the factors are only abstractly related to a believed behavior and independent from one another, the subjective component in determining a risk requires the police to balance normative judgments with human characteristics that are independently neutral. In addition, because these risk factors must be systematically accessible and capable of being numerically compared, subjective choices must be made on the weighting of factors.[38] In the realm of criminal law, problems surrounding the legal rights of citizens can easily arise. For instance the principle of legality requires that the state makes it known that particular acts are punishable by criminal sanctions.[39] Though the criminalization of preparatory or inchoate crimes continues to increase, it is problematic that police may act on a behavior that is perceived as to some degree contributing to risk only in correlation with other, non-criminal factors. Later sub-sections will briefly outline other examples of a regulatory enforcement schemes.

ii. Pushing the bounds of prevention and investigation into the preparatory phase

Depending on the jurisdiction, crime control falls within the purview of one or several actors. In civil law countries, often police may enforce public order as a component of public safety, and the investigation and intervention in criminal acts as an application of criminal law,

[37] Jones, *Criminology*, pp 93.
[38] Cohen, "Georgetown Public Law and Legal Theory Research Paper No. 1012068" pp 187.
[39] Mireille Hildebrandt, 'Domains of Law: Private, Public, and Criminal Law', *Law for Computer Scientists and Other Folk* (Oxford University Press 2020), 60.

occurs after the fact and is generally directed by a prosecutor.[40] In common law countries, police are often responsible for crime prevention and investigation as two sides of the same coin, nearly indistinguishable in practice. However, in response to the perceived risk society, criminal law enforcement increasingly takes on the procurement of information unrelated to crime as a means of preventing future crime. As non-criminal acts seen as indicative of imminent crime become relevant to policing, the acts of public order and investigation are blurred, as are the boundaries of social life and criminality. Prevention, or what may arguably be called proactive investigation prior to the commission of a crime, goes a step further and creates a new investigatory function of crime control.[41]

The evolution of the risk society is not limited to crime control but extends across sectors and modes of law enforcement. Across jurisdictions particular violations of the criminal code may be handled by administrative or civil sanctions, or may involve a sequence of acts that span the range of chargeable violations. Similarly, private actors are increasingly called upon to manage public order through means that include the private surveillance of businesses through technology or personnel, with the mandate to intervene in the case of crime or violation of code. Indeed in the case of financial crime, as described briefly below, there is often a hybrid approach to preventing and monitoring for crime, at which point the police or state intervene as enforcer of sanctions. This compliance-based approach is aimed at violations in self-regulation, prior to the commission of a harm, whereas with police, the enforcement may occur through court proceedings and only after the offense is committed.[42] Increasingly, police utilize technology or

[40] Consultative Council of European Prosecutors, "Opinion on the Role of Prosecutors in Criminal Investigations."
[41] Marianne FH Hirsch Ballin, *Anticipative Criminal Investigation: Theory and Counterterrorism Practice in the Netherlands and the United States* (TMC Asser Press 2012), 27-28.
[42] Tobias Mahler, 'Artificial Intelligence Risk Management, the Risk-Based Approach in the Artificial Intelligence Act' (University of Oslo Faculty of Law 2022), 22.

information that is of a private origin, further blurring their autonomy as state actors. Therefore the tools used, actors called upon, and offenses pursued have great variation.

4. The policy discussion surrounding predictive policing

Though technology, and in this case technology as an economic driver, may be seen as having a harmonizing effect on law, this is not the case with predictive policing.[43] The policy debates surrounding sophisticated methods of crime prevention and predictive policing specifically, raise numerous questions over their appropriateness vis-à-vis norms, law, and value systems. This, paired with highly divergent approaches to regulating AI lays bare deeper chasms in conflicting approaches to what is acceptable criminal law enforcement and the affected rights framework(s). One of the first questions after defining AI in a legally satisfactory way requires identifying what outcomes may be identified as preferable or unacceptable in light of the goals of AI and what derogations on rights are acceptable. Even within a single use case, issues such as value alignment may cause lack of clarity in what constitutes a lawful application of AI. The value alignment problem in AI may be described as lack of consistency between the sought after utility function of the developers and the goals of the user.[44] For instance a statistical accuracy of 85 percent may be to the program developers a positive outcome, whereas to the 25 percent of humans who are wrongly targeted by the program, this is not successful. Indeed, a result of high statistical accuracy applied to policing does not reliably indicate a fair or right decision from a legal standpoint.[45] This sociotechnical problem reflects the incongruous intersection of

[43] Michele Graziadei, 'Comparative Law as the Study of Transplants and Receptions', *The Oxford Handbook of Comparative Law* (Oxford University Press 2006), 459-461.
[44] Tobias Mahler, 'Artificial Intelligence Risk Management, the Risk-Based Approach in the Artificial Intelligence Act' (University of Oslo Faculty of Law 2022), at 19.
[45] Caroline Gans-Combe, 'Automated Justice: Issues, Benefits and Risks in the Use of Artificial Intelligence and Its Algorithms in Access to Justice and Law Enforcement', *Ethics, Integrity and Policymaking*, vol 9 (2022), 180.

technology with policy.[46] Regardless, adopting a risk-based approach to AI inherently accepts that it will be used, and seeks to mitigate harms under a measured cost-benefit analysis of potential economic or social benefit versus potential harms to society or individuals.[47]

To date, and across jurisdictions, it appears that the preferred enforcement mechanism for AI is based on a risk regulation framework. In so doing, legislators are inherently adopting a harm reduction framework as opposed to an approach based on the precautionary principle which would prevent the use of AI until all risks were safely mitigated. By centering on risk, the approach is necessarily future oriented, assessed at the level of collective harms, contains a focus on causality, rationality and quantification.[48] Despite this unified approach at the more general level, there is wide divergence between jurisdictions in the choice of how to effectuate regulation, described in the foregoing sub-sections.

i. Permissible uses of AI in Europe: courtroom uses versus policing

Policy discussions on the appropriate uses of AI in the European Union are progressing in tandem with technological development, but continue to precede its lawful use for many activities. The Artificial Intelligence Act (AIA), which is currently pending next steps in the legislative process, as proposed sets forth the allowable uses of AI by categorization according to the level of risk they pose to users and the population.[49] The proposal aims to take a regulatory approach to monitoring the use of AI, balancing fundamental rights and legal certainty with

[46] Andrew Dana Hudson, Ed Finn, and Ruth Wylie, "What Can Science Fiction Tell Us about the Future of Artificial Intelligence Policy?," *AI & Society*, September 20, 2021.
[47] Kaminski (n 49), 23.
[48] Margot Kaminski, 'Regulating the Risks of AI' (2023) 103 Boston University Law Review, 7.
[49] COM (2021) 206: Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL LAYING DOWN HARMONISED RULES ON ARTIFICIAL INTELLIGENCE (ARTIFICIAL INTELLIGENCE ACT) AND AMENDING CERTAIN UNION LEGISLATIVE ACTS was adopted by the European Commission as a proposal in April 2021. Text available at <https://eur-lex.europa.eu/legal-content/EN/ALL/?uri=CELEX:52021PC0206>.

enhanced economic capability and scientific innovation.[50] The basis for the proposal is TFEU Article 114, which allows for the approximation of laws that facilitate the functioning of the internal market. The approach mirrors a product safety/liability regime aimed at mitigating potential infringements on fundamental rights.[51] Notably, despite prioritizing fundamental rights the AIA favors a risk-based approach over a rights based approach, and is intended to establish "common normative standards" by which regulation will be ensured.[52] The risk based approach is structured to address uses of AI according to their perceived (or where calculable), actual levels of risk to either health and safety, or fundamental rights.[53] This is also an important facet of the Act, as this approach is inherently regulatory in nature, though violations of fundamental rights are traditionally treated *ex post-facto*. The AIA will be discussed at further length in the context of fundamental rights and data protection in Chapter 5.

There is notable, contrasting debate around the use of AI by criminal justice and criminal law enforcement entities in the EU. Namely, the use of AI for predictive policing has been widely subject to calls for a total ban whereas AI is already used in courtrooms and will likely continue to be so, including as an amendment to the AIA.[54] Existing categories of use by court staff may be classified as *inter alia*, caselaw search engines; mail sorting platforms; drafting assistance tools; predictive analysis; and information 'chatbots.'[55] These tools are intended to assist judicial staff and judges with sorting and collecting vast quantities of information, rather than to guide decision making directly. Many of these are applied to civil, administrative, and

[50] Id. (2021) at Recital 6.
[51] Michael Veale and Frederik Zuiderveen Borgesius, 'Demystifying the Draft EU Artificial Intelligence Act' [2021] Computer Law Review International 97, 98.
[52] Proposal (2021) at Recital 13.
[53] Kaminski (n 49), 49.
[54] Caroline Kemper, 'Kafkaesque AI? Legal Decision-Making in the Era of Machine Learning' (2020) 24 Intellectual Property & Technology Law Journal 251, 266.
[55] 'European Ethical Charter on the Use of Artificial Intelligence in Judicial Systems and Their Environment' (European Commission for the Efficiency of Justice 2018), at 17.

criminal law. Criminal justice uses of AI confined to the courtroom are categorized by the AI Act as 'risky' on the assumption that some level of decision-making is involved such as predicting recidivism,[56] but there is far less contention over administrative uses of AI by courts.[57] Though there are comparable risks and levels of data collection and mining, predictive policing is generally considered to be more risky than judicial uses of AI in general.

Indeed, the use of predictive policing has been explicitly targeted as a candidate for a full ban, under the AIA. There are several reasons which are considered the foundation for the differing perceptions on using AI for predictive policing from that of other criminal justice processes. The first is the potential implication on due process rights. In the case of policing, any violation of rights is only addressable *ex-ante* and there is limited recompense. As regards misuse or error by AI in a court, there are measures in place to prevent such an occurrence.[58] Similarly, use of these systems in a court system, by a party to a case, raises few questions of legal certainty. Where police may encounter anyone for any purpose without that individual's expectation of such an encounter, there is no legal certainty as to what may occur and what technology that officer may possess. For this reason the use of AI by police has been considered as "intrusive" and prone to affecting persons who "have given no or only slight cause for police observation" in violation of purpose limitation, in essence there is no real consent. The scope of AI use in a courtroom is slightly better fenced, generally more transparent and not aimed at decision-making.[59]

[56] 'European Commission Adoption Consultation: Artificial Intelligence Act' (European Digital Rights 2021), 14.
[57] Kalliopi Terzidou, "The Use of Artificial Intelligence in the Judiciary and Its Compliance with the Right to a Fair Trial," *Journal of Judicial Administration* 31 (2022): 154–68.
[58] Recital 40 of the AIA distinguishes between AI systems used to assist judicial authorities versus those that are intended for "purely ancillary administration of justice" processes.
[59] 'Joint Opinion 5/2021 on the Proposal for a Regulation of the European Parliament and of the Council Laying down Harmonised Rules on Artificial Intelligence (Artificial Intelligence Act)' (n 7), at 10.

Another way in which the approach toward AI in courtrooms versus by police may be justified is the legal function of either entity. As stated, parties in a courtroom are on notice that they are subject to the ruling of the court and data used are already in possession of the relevant authority prior to the use of AI by the court. However should the police stop and arrest an individual solely due to the advanced knowledge an AI tool may allow, the use of AI may be seen as a *de facto* cause for the individual's encounter with the legal system, which has future repercussions due to phenomena such as the feedback loop, or the effect of a criminal record. This is a direct challenge to the presumption of innocence and the building of suspicion, if not a negation of the protections which they offer to the fair trial process. In addition, the notion that these tools should be used to target crime has pushed police 'managerial logic' to its bounds, as the same resources may otherwise be diverted to addressing the root causes of crime.[60]

One criticism of the proposed AIA approach is that the high risk category already encompasses areas that are highly regulated and generally out of reach from most people's day to day lives, whereas the medium risk categories which receive a lower threshold of regulation, encompass tools that individuals interact with regularly.[61] In sum, the European approach to regulation may therefore be categorized as a risk-based approach according to perceived risk relevant to use. That predictive policing is one of the few activities deemed 'high risk' and feasibly subject to a ban, it is argued here that its effects merit careful scrutiny. The potential implementation of the AIA is further discussed in Chapter 5.

[60] ibid, at 51.
[61] Mahler, "Artificial Intelligence Risk Management, the Risk-Based Approach in the Artificial Intelligence Act."

ii. Technology precedes regulation: the U.K. and the U.S. approaches

In the United States and United Kingdom the regulation of AI stems from different legal foundations and perspectives though similarly favors a regulatory approach at base. Whereas the AIA is seen as harmonizing the use of AI technologies by ensuring that their design is considered with regard to existing frameworks, such as fair trial rights and data protection, the approach differs in these common law systems. Whereas in Europe most predictive policing programs are created in-house or in partnership with a public research entity, usually a university, in the U.S. and the U.K. predictive policing programs are frequently generated by private companies.[62] This adds another layer of complication to regulation, particularly as while the AIA seeks to regulate prior to production and introduction in the market, in the U.S. and the U.K. companies are not the target of regulation, but the users.

First, the United States does not maintain a cross-sectoral, unified data protection regime as seen in Europe or the U.K. and therefore the disconnect between private entities using personal data typically does not pose a legal problem. Similarly, there is no need for transparency or individual rights against the issuance of a decision that is totally founded by non-human means, such as the prohibition on automated decision making.[63] The use of AI by police and in courts in the U.S. is now so commonplace and established that the country is considered as having entered the 'second wave' of policing by AI-systems.[64] This has been possible as in addition to the total dearth of AI regulation, tied to a unwillingness to stifle commercial or technological innovation, there is no national regulation of police.

[62] Elizabeth Joh, "The Corporate Shadow in Democratic Policing," *Science* 374, no. 6565 (October 15, 2021): 274–76.
[63] ibid, 55.
[64] Elizabeth Joh, "Ethical AI in American Policing," *Journal on Emerging Technologies* 3, no. 2 (May 2022).

In recent years several federal laws and initiatives have been put forward, typically in the form of voluntary frameworks meant as guidance to AI developers and users.[65] Legislation with a legally binding function emphasize the diversion of funding and research to AI development so to fuel economic growth and innovation.[66] Most notably on the federal level is the Department of Commerce, National Institute of Standards and Technology (NIST) draft "AI Risk Management Framework".[67] As with other proposed federal AI legislation, when implemented the Framework will be soft law which will not be binding on entities, despite providing top-down guidance on managing the risks of AI. Like the AIA, it approaches risk from a regulatory standpoint, in which organizations utilizing AI are implored to 'Map, Measure, and Manage' risks posed by AI according to Framework guidance. Risks are identified according to the following categories, "technical characteristics, socio-technical characteristics,[68] and guiding principles," such as fairness, accountability, and transparency.[69] Therefore the Framework does not seek to limit the production and marketization of AI development, but rather puts the onus of self-regulation on organizations which may choose to utilize already developed products. Due to the nature of the federal system, to date it appears that most regulation of AI will manifest at the state level, particularly AI tools for policing.

In fact the prioritization of innovation is so great that many local law enforcement agencies benefit from federal funds or research grants specifically for the use of AI despite a lack

[65] See "AI Risk Management Framework: Initial Draft" (National Institute of Standards and Technology, March 17, 2022). The framework explicitly states that the use of risk categories for AI is not effective, but instead identifies areas where risk should be sought and mitigated: in technical characteristics, socio-technical characteristics, and guiding principles, at 7.
[66] National AI Initiative Act of 2020 (Division E, Sec. 5001, National Defense Authorization Act for Fiscal Year 2021) in effect as of 1 January 2021 <https://www.congress.gov/116/crpt/hrpt617/CRPT-116hrpt617.pdf#page=1210>.
[67] "AI Risk Management Framework: Initial Draft."
[68] 'Socio-technical' refers to "how AI systems are used and perceived in individual, group, and societal contexts." NIST AI Risk Management Framework at 10.
[69] Kaminski (n 49), 59.

of regulation.[70] Enforcement of police compliance with the law generally takes the form of carrots and/or sticks, such as by tying police action to federal funds either as incentive or threat, in the allocation or discontinuance of research grants.[71] Therefore as police mandates and regulations are decentralized and set at a local level, federal guidance can only be used as providing guidance to parties voluntarily regulating or to state lawmakers deciding legal frameworks for AI. These regulations are piecemeal and in some place are characterized by total bans on particular technology, such as facial recognition technology. These types of approaches are inconsistent with other sectors such as for employment or in healthcare, too specific yet very broad, and rarely do much to affect actual policing on the ground.[72] Despite the lack of direct regulation over policing, the *effect* of police action on individuals or communities must comply with individuals' rights and several federal laws, such as the Violent Crime Control Act and the Law Enforcement Act of 1994, which guard against the infringement of individuals' constitutional rights as the result of policing 'patterns or practices.'[73] Where there has been deemed some violation of constitutional rights, the federal Justice Department may bring a civil action against the police department. Similarly, the use of AI by both police and courts do not only assist in functions such as information sorting and procurement, but also with decision-making processes that directly rely upon AI-based systems.[74]

Similarly, the use of predictive policing in the United Kingdom is fairly well established. In 2019 it was estimated that fourteen police forces had previously been, or were at the time,

[70] "Predictive Analytics in Law Enforcement: A Report by the Department of Justice" (United States Department of Justice, November 2014).
[71] Matthias Leese and Simon Egbert, 'The Police and Technology', *Criminal Futures; Predictive Policing and Everyday Police Work* (Routledge 2020), 56.
[72] Joh, "Ethical AI in American Policing."
[73] 'Predictive Analytics in Law Enforcement: A Report by the Department of Justice' (United States Department of Justice 2014), at 6.
[74] "Predictive Analytics in Law Enforcement: A Report by the Department of Justice."

using predictive policing software, amounting to about one third of U.K. policing agencies.[75] As of April 2020, seven departments voluntarily disclosed their use of predictive policing of AI for policing decisions.[76] These numbers may be misleading due to the cross categorization of some predictive methods, specifically in the identification of individual risk assessment tools as both predictive policing and sentencing programs.[77] Similarly, some studies include the use of facial recognition technology as predictive policing. Regardless, the approach to AI seems to mirror a U.S. preference for innovation over blanket, hard law restrictions.

The types of predictive policing programs utilized in the U.K. include both person- and place-based predictions. Several U.K. police forces utilize individual risk assessment programs, which often pair local authorities with social services providers. Some of the programs employed by U.K. police forces are sourced from software companies, however there appears to be a trend toward in-house development of predictive policing software. Whereas there is no federal regulation of police in the U.S., in the U.K. police are mandated by the Police and Criminal Evidence Act 1984 and the Police Act 1996. Where the use of predictive policing may fit into existing mandates it has thus far been considered within the ambit of lawful police practice. If questions of discrimination arise, then predictive policing will be examined as to its effects within existing police regulation and fundamental rights frameworks, however the use of AI is in itself still largely unregulated.

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[75] Hannah Couchman, "Policing by Machine, Predictive Policing and the Threat to Our Rights" (London: Liberty, January 2019).

[76] Will Grimond and Asheem Singh, "A Force for Good? Results from FOI Requests on Artificial Intelligence in the Police Force," Tech and Society Programme (Royal Society for the encouragement of Arts, Manufactures and Commerce, April 2020).

[77] A 2019 Liberty report, for instance, tallies the Durham HART program within the predictive policing person-based category ("individual risk assessment program") whereas the Metropolitan police are only categorized as using place base predictive policing methods, despite its comparable risk assessment tool, the Trident Gang Matrix.

In 2022, the United Kingdom unveiled a policy paper outlining its proposal for a National AI Strategy, designed to align with the Data Protection and Digital Information Act. The Strategy is designed on the premise that the government will not regulate AI technology development directly, but will offer guidance to industry on how to best regulate the use of technology according to sector.[78] The approach is intended to be innovation friendly and explicitly rejects the EU intention to harmonize its regulation across countries and sectors.[79] The strategy proposes core goals and characteristics of AI in order to build a framework from which regulators self-manage the use of AI accordingly to their specific sector and the intended use. This is termed by the Strategy as a "context-based approach"[80] with a "lighter touch."[81] Here, as in the U.S., innovation and economic openness appear to drive the manner in which regulation proceeds, even if built upon similar principles to those enshrined within the AIA.[82] The proposed Strategy principles are consolidated into the following six categories: safe use; technical security and functional accuracy; transparent and explainable; fair; accountability for legal persons; and clear and available routes to redress.[83] It is explicitly left to the regulator how those principles are defined, according to the specific use. Similarly to as will be discussed below in sub-section B(b)(i), this mixed regulatory approach, in which state and private actors act in hybrid, is also a feature of financial regulation and will be informative to the questions addressed by the thesis.

[78] Cynthia O'Donoghue, Sarah O'Brien, and Yunzhe Zhang, "UK Government Announces Its Proposals for Regulating AI," *ReedSmith Technology Law Dispatch* (blog), September 2, 2022, https://www.technologylawdispatch.com/2022/09/privacy-data-protection/uk-government-announces-its-proposals-for-regulating-ai/#.
[79] U.K. Secretary of State for Digital, Culture, Media and Sport, 'AI Regulation Policy Paper' (2022).
[80] U.K. Secretary of State for Digital, Culture, Media and Sport.
[81] O'Donoghue, O'Brien, and Zhang, "UK Government Announces Its Proposals for Regulating AI."
[82] Jessica Fjeld et al., "Principled Artificial Intelligence: Mapping Consensus in Ethical and Rights-Based Approaches to Principles for AI" (Berkman Klein Center for Internet & Society, January 15, 2020).
[83] Oliver Yaros et al., "UK Government Proposes a New Approach to Regulating Artificial Intelligence (AI)," *Mayer Brown* (blog), August 17, 2022, https://www.mayerbrown.com/en/perspectives-events/publications/2022/08/uk-government-proposes-a-new-approach-to-regulating-artificial-intelligence-ai.

As in the EU, data protection legislation does offer some limitations on predictive policing as regards fundamental rights. However this is separate and apart from the regulation of AI. Concerns surrounding the use of data include purpose limitation, the sharing of data with third parties, data minimization, and correctability.[84] Simultaneously U.K. police departments are building bigger, more integrated databases for the sharing of crime data across jurisdictions.

As the regulation of AI varies by jurisdiction, the legal frameworks applied to its use in policing are similarly divergent. Though predictive policing may be at its core largely uniform as a practice, its use and legal effects vary according to the applicable legal framework to which it is subject.

B. Fragmented Legal Framework

As outlined above, this introduction will provide a brief overview for some legal frameworks or regulatory regimes which may be applicable to predictive policing. This discussion is intended to provide the context in which the thesis will attempt to answer the question as to where predictive policing may be situated as regards criminal justice and fundamental rights. This sub-section will propose that predictive policing straddles enforcement regimes and as a result, changes the application of punishment and the rights available to defendants or suspects. The examples of financial crime monitoring and counter intelligence will provide parallels to data driven forms of compliance based enforcement, which will in the later analysis will be compared to the use of predictive policing.

[84] Couchman, "Policing by Machine, Predictive Policing and the Threat to Our Rights" at 73.

1. Exploring the laws applicable to predictive policing: data protection, human rights, policing laws

Crime prevention, unlike reactive means of crime control, takes place outside the formal justice system, that is prior to the issuance of a charge, further confusing the application of due process in many jurisdictions.[85] However as will be argued at further length in Chapter 4, the use of predictive policing mirrors a criminal investigation in a number of ways. First, the criminal investigation is a gathering of information which may be relevant as evidence. This may include large scale scanning of data and information, or initiating interactions with particular individuals or group members. Second, a criminal investigation often focuses on a suspect profile, around which information may help to indicate who was the perpetrator of a crime. This is much like the use of a criminal profile to predict who or what location matches incidents of prior crimes. Finally, these taken together illustrate a mirrored process by which the collection and processing of myriad data lead police to a person who may have or will commit a crime. Often these data may be shared and lend support between investigative and predictive pursuits. As this thesis will argue, the use of AI to support sophisticated statistical processes allows the predictive use of these practices to become much more intrusive in effect, bringing it closer to the practice of investigation without the legal protections.

By blurring the distinction between crime prevention and investigation, and merging them into a new form of predictive scrutiny, predictive policing further shifts enforcement of criminal law by moving from public and criminal law into the realm of private and administrative law. For instance, whereas crime prevention was largely a matter of maintaining public order and therefore generally in the provenance of public law, the new focus on behaviors believed to be

[85] Brandon Welsh and David Farrington, *The Oxford Handbook of Crime Prevention* (Oxford University Press, 2012).

precursors to crime shifts policing to a form of regulatory enforcement. As in financial crime, the monitoring of potentially suspect behavior, even if not criminal, is prioritized. As in the case of counter terrorism intelligence, the collection of information is similarly used to piece together what may lead to criminal behavior in the future.

As discussed above, the United States and United Kingdom, two common law systems, approach the regulation of AI very differently than the EU. In addition to the different legal frameworks that may apply (or the lack thereof), the nature of common law systems changes the way in which individuals interact with the police when these technologies are in fact utilized and challenged. When a claim is raised regarding a police practice, the court will rule upon the use (and make law) according to the defendant making the claim. This is problematic as 1) not all defendants are an appropriate proxy subject and the risk of *res judicata* barring a future, similar claim is problematic; and 2) policing uses of AI are broad and deep and the evidence necessary for a claim is not always available, apparent, or directly tied to the action.[86] As with financial crime monitoring and counter-terrorism, the blurring of criminal law with a compliance or administrative based approach risks inadequate enforcement or protection of rights.

In all of the systems discussed throughout the thesis, human and fundamental rights apply to policing and therefore predictive policing without exception, even if not parallel in construction. Among the rights included are the right to due process and a fair trial, the right against discrimination, and the right to privacy and data protection. Where the uncertainty arises is the application of criminal justice frameworks to predictive policing. Unlike administrative and civil sanction regimes, criminal justice protections generally commence with the start of an investigation or the point at which an individual is identified as a suspect to an existing crime. In

[86] Joh, "Ethical AI in American Policing."

the case of predictive policing there is no harm as of yet and no crime for which an individual may be a suspect. The thesis therefore will aim to consider whether certain criminal justice protections apply, such as the presumption of innocence. Similarly, thresholds for suspicion and the proscription on certain police acts differs in predictive policing from a traditional police investigation. Thresholds for suspicion and even the genesis of a suspicion are invariably altered by the automated nature of predictive policing. As will be outlined in Section D. of this introduction, the thesis will proceed by examining the use of predictive policing through the jurisdictions, as it aligns (or is misaligned) with the principles of these frameworks.

The following examples are intended to demonstrate a system of enforcement which relies almost completely on pre-emption and prevention through the monitoring of non-criminal acts which are treated as anomalous pre-cursors to criminal behavior. It will be shown that these systems, much like predictive policing, utilize the myriad data of the many to determine where the sources of crime may arise, based on non-criminal indicators defined in advance as targets of regulation. In both examples the use of non-criminal acts to bridge the enforcement gap to criminal law is clear. Though not explored here, an opposite example would be that of depenalization. Legal depenalization is the de- or lesser criminalization of acts to the realm of administrative law. In this way a conduct may still be prohibited, but the sanction regime changes.[87] This has repercussions also shared with increased penalization, in that the remedies available to individuals as well as the requisite rights of defendants must necessarily adapt.

In both of the examples it is also a useful parallel to note that neither approach to preventing crime is based on the state's prerogative to criminalize individuals. Rather as criminal law sets the guidelines for what behavior may be punishable, these forms of predictive

[87] Gans-Combe (n 44), 183.

enforcement instead identify the behaviors that may indicate a later punishable behavior to be probable.[88] In examples to be later discussed, such as the London Gangs Matrix, by mandate police explicitly warned individuals that they may be punished for future behavior though their current behavior is not criminalized.[89] Finally, the blurring of crime control and prevention will be discussed.

2. Examples of legal frameworks of prediction: financial crime monitoring and intelligence for counterintelligence

Per the above discussion, policing generally straddles public law and criminal law as its principle areas of enforcement. However there are other enforcement models which may also be suited to the evolution of crime control toward prevention. Criminal and public law are traditionally considered vertical forms of enforcement, as the law and enforcement thereof comes directly from the state, whereas private or administrative laws are horizontal in enforcement, that is, direct between parties.[90] As established, the risk society is a regulatory society, and by definition one that regulates behavior, not necessarily individuals.[91] Similarly, in the case of financial compliance, particularly with the use of AI, crimes may be investigated in a strictly regulatory, yet predictive manner. That is, crime is monitored based on a self-regulatory compliance of non-criminal acts.

[88] Hildebrandt, "Domains of Law: Private, Public, and Criminal Law."
[89] Amnesty International, "Trapped in the Matrix: Secrecy, Stigma, and Bias in the Met's Gangs Database" (Amnesty International, May 2018).
[90] Hildebrandt, "Domains of Law: Private, Public, and Criminal Law."
[91] O'Malley, "Risk and Responsibility." pp 189.

Financial crime

In the summer of 2022, a member of the Supervisory Board of the European Central Bank stated that technology solutions "nee[d] to be buttressed by three pillars: an appropriate regulatory framework, sufficient supervisory oversight and, last but not least, a deep understanding by users."[92] She made this statement in a speech on the role of technology, both opportunities and challenges, for a European anti-money laundering authority. Due to the compliance approach to financial monitoring, AI is already a very important technology in monitoring complex and myriad transactions. This is the approach generally taken, as in the Securities and Exchange Commission and Financial Industry Regulatory Authority in the U.S., where AI plays a prominent role.[93]

Financial supervision is broadly categorized into three umbrella approaches; the institutional/sectoral approach, the functional approach, and the objectives-based approach.[94] Of these, compliance as a means of objectives-based enforcement is a popular choice for preventing financial crime. It may be viewed as the interaction between rules and behavior, aiming to get ahead of a harm by criminalizing a particular behavior due to its potentially harmful effect on the economy, market, or individuals. Compliance based prevention may consist of "auditors, management consultants, behavioral economists, psychologists, and organizational scientists."[95] A compliance based approach to regulation takes an instrumental approach to the law, in which behavior of individuals and organizations inform cultural, sectoral norms which are shaped by

[92] Elizabeth McCaul, "Technology Is Neither Good nor Bad, but Humans Make It So" (speech, The use of artificial intelligence to fight financial crime, Turin, July 13, 2022).
[93] Jo Ann Barefoot, 'The Case for Placing AI at the Heart of Digitally Robust Financial Regulation' (Center on Regulation and Markets at Brookings 2022), 5.
[94] Melissa van den Broek, *Preventing Money Laundering; A Legal Study on the Effectiveness of Supervision in the European Union* (eleven international publishing 2015), 72.
[95] Benjamin van Rooij and Daniel Sokol, 'Introduction: Compliance as the Interaction between Rules and Behavior', *The Cambridge Handbook of Compliance* (Cambridge University Press 2021), 2.

and accordingly shape the relevant law. Through the interpretation and institutionalization of rules, the law and its accompanying set of norms is legitimized.[96] Due to the hybrid nature of many financial enforcement regimes, which rely on organizational support to varying degrees, this is a practical approach. In addition, this symbiotic rule setting further blurs the boundary between public and private mandates for enforcement. Similarly, the effect of organizational norm setting on the law also transforms the application of individuals' rights and remedies. For instance, through their interpretation of compliance with consumer warranty laws, manufacturers in the U.S. were able to modify *public* remedy from one that was generally exhausted in court, to *private* rights centered in dispute resolution mechanisms.[97]

An increasing reliance on compliance can be seen in the EU as one among numerous new enforcement regimes. This raises a number of issues for criminal justice and law enforcement. Compliance sets a different punishment scheme, which differs from traditional retributionist or rehabilitative means and instead seeks to deter criminal behavior by intervention in norm setting. Notably the result is a distancing of economic and financial law enforcement from criminalization.[98] The overlap of criminal and non-criminal law to punish via compliance also means that administrative sanctions increasingly take on a punitive nature despite formally being considered civilly derived. As is discussed in Chapter 3 on the presumption of innocence, abandonment of the harm principle for *malum prohibitum* laws also challenges notions of legal certainty.[99] In addition, the rights of defendants and procedural protections are applied against

[96] Shauhin Talesh, 'Constructing the Content and Meaning of Law and Compliance', *The Cambridge Handbook of Compliance* (Cambridge University Press 2021), 64-65.
[97] ibid, 70.
[98] Katalin Ligeti and Stanislaw Tosza, "Introduction," in *White Collar Crime, A Comparative Perspective* (Hart Publishing, 2018).
[99] ibid at 8.

the criminal/non-criminal and public/private divides that are increasingly less distinguishable in practice.

Further complicating this shift in financial crime compliance is the evolution of the different modes of enforcement. RegTech has captured the need for more and better data management for effective compliance and monitoring. This causes a shift from a "customer-based" approach to one which is "data based."[100] In addition, it allows for increased information sharing between institutions and across sectors. This diffusion of information as a means of facilitating efficient decision making may risk the automation and perpetuation of bad data or unseen biases in data or programs.[101] This further complicates the enjoyment of rights and application of procedural protections across the mixing of public-private enforcement mechanisms and entities.

The example of financial enforcement will be returned to in Chapter 6, in which the analysis of predictive policing will be compared. The mirror image of data-based enforcement of criminal law based on a preventative or *malum prohibitum* approach will be weighed against new forms of crime prevention.

Intelligence for countering terrorism

Similar to the compliance approach to preventing financial crimes, the case of information gathering for counter terrorism presents an interesting parallel to the use of data for predictive policing.[102] Preventive measures against terrorism fall within the ambit of national

[100] Esman Kurum, "RegTech Solutions and AML Compliance: What Future for Financial Crime?," *Journal of Financial Crime*, April 15, 2020.
[101] Kurum.
[102] "Detecting and ANalysing TErrorist-Related Online Contents and Financing Activities (DANTE); Final Report on Dissemination Activities" (European Commission, March 7, 2019).

security and in many countries only recently have begun to assume enforcement mechanisms from administrative and criminal law. As a result the investigatory and prosecutorial powers of the state in the name of counter terrorism have widened the scope of criminal law enforcement as a mechanism against potential violations of national security. In other countries criminal law is not directly invoked in counter terrorism, however the violation of administrative sanctions related to national security may be punishable by criminal penalties. The expansion of these prongs of criminal law may be applied directly to acts of harm or deemed preparatory to harm, or non-criminal acts which may be deemed as having an act of terror as their motivation.[103] Therefore as in financial crime and predictive policing, data anomalies may trigger criminal law enforcement scrutiny in the belief that they indicate behavior that may evolve into acts of terrorism.

Here also there is a *de facto* expansion of criminal law enforcement from what was previously reserved for the investigation and punishment of serious harms, to one in which criminal justice acts as an instrument by which secondary state goals may be pursued.[104] In this way, the institutions responsible for monitoring for activity that may be deemed suspicious act as 'gatekeepers' to law enforcement who may formally transform an identified individual into a suspect, regardless of the actual lack of a harm.[105] Suspicion may also be derived of suspicious data, such as metadata, associational and geolocational data, patterns, and correlative data.[106] This may raise questions of principles such as the presumption of innocence, except that national security provides lower standards of protection to suspects. The issue with overlapping methods

[103] Matthias Borgers and Elies Van Sliedregt, "The Meaning of the Precautionary Principle for the Assessment of Criminal Measures in the Fight Against Terrorism," *Erasmus Law Review* 2, no. 2 (2009): 171–95.
[104] Hirsch Ballin (n 50), 542.
[105] Directorate-General for Internal Policies, 'Artificial Intelligence and Law Enforcement, Impact on Fundamental Rights' (Policy Department for Citizens' Rights and Constitutional Affairs 2020) PE 656.295 <https://www.europarl.europa.eu/RegData/etudes/STUD/2020/656295/IPOL_STU(2020)656295_EN.pdf>, 23.
[106] Margaret Hu, 'Big Data Blacklisting' (2016) 67 Florida Law Review 1735, 1786.

of enforcement, is that criminal law enforcement methods are being used, which traditionally must meet a higher standard of suspicion and requires stricter adherence to principles of due process.[107]

Also like predictive policing and to an extent financial monitoring, the use of myriad data by law enforcement and national security authorities risks the building of evidence against an individual prior to the commission of a harm. Data that is in itself non-criminal when taken together, may be retrofitted onto a later crime, allowing the relevant authorities to build a case against an individual long before any crime is committed. In the case of overlapping law enforcement entities that rely on information sharing, there is a no clear answer as to how the rights of an individual may dictate data retention and usage; the ability to challenge evidence; and the point at which an individual becomes a suspect.

The enforcement models of both financial monitoring, as well as counter terrorism, offer valuable parallels but notable differences to the study of predictive policing. Analyzing these enforcement models as well as the manner in which individuals' rights are ensured at later trial stages will provide insights as to the applicable legal framework(s) for predictive policing, as discussed in chapters 3-5.

C. Methodology: Comparative Analysis

The thesis seeks to answer the question of which legal framework(s) apply to predictive policing, so to ascertain its lawful place in the application of criminal law enforcement. As will be explored, predictive policing does not sit neatly either within the human rights framework nor the criminal justice framework, but clearly may affect individuals' rights in both. As has already

[107] Hirsch Ballin (n 50), 543-544.

been discussed, due to the wide proliferation of AI, its use may be regulated from an economical, scientific, or rights' standpoint, but none apply to predictive policing exclusively nor can alone adequately address its use. The thesis will therefore proceed in the following manner, in order to answer the question as to how this functional harmonization of a police tool is legally situated across jurisdictions.[108] From a comparative analysis of three jurisdictions; the Council of Europe, the United Kingdom, and the United States, the thesis will focus on the function of predictive policing and apply the existing approaches both laterally, across the human rights and criminal justice frameworks, as well as transversally through the analysis of jurisdictions. Each chapter will also include a CoE country or the EU for a national view of how European laws are implemented at the national level and the effects vis-à-vis predictive policing.

Because it is not feasible to make a full comparison of all states for every issue raised, the choice of jurisdictions is based in relative relevance to this study. Similarly, though highly relevant in many national and some international contexts, soft law sits outside the scope of the work. This analysis will seek to demonstrate that despite the differing interpretations of the legal frameworks within the respective jurisdictions, predictive policing does not align to existing standards of fundamental rights and criminal justice, further complicated by the use of AI, and therefore its regulation must be evaluated and improved upon.

1. Exploration of jurisdictions applying aspects of the above frameworks

There are a number of shared principles that appear across jurisdictions and may form a critical component in regulating police uses of AI. These principles apply to AI generally,

[108] For a discussion on the functional method of comparative law see K. Zweigert and H. Kotz, "The Method of Comparative Law," in *An Introduction to Comparative Law*, Third (Oxford University Press, 1998), 32–47; Ralf Michaels, "The Functional Method of Comparative Law," in *The Oxford Handbook of Comparative Law* (Oxford University Press, 2006), 339–82.

however the use of risk assessments by police requires special attention to secondary effects that AI may have in a criminal law context. For instance, explainability is one of the most important concepts in regulating AI and usually refers specifically to the ability of users or those affected to consistently understand the process of AI and how it is applied.[109] However in the context of policing and legality, it should also be explainable in that the technology is being used and for what purpose, in addition to explainability of the tool itself.[110] Similarly, fairness should not just be about bias within the use or particular decisions taken by AI, but also the decision to use the systems, as well as where and how. Fairness must be based in the acknowledgment that cultural differences may define fairness unevenly according to context. These concerns highlight the importance of a legal and regulatory framework that accounts for the nuance and importance of police decision-making, rather than just applying a blanket approach, as discussed in the context of data protection in Chapter 5.

This thesis approaches the potential human problems of AI for policing by addressing both the fragmented and tense relationship of the rights frameworks. As will be argued throughout, the fragmented framework is insufficient to protect against the harms of predictive policing, but in addition there are aspects of certain protections that may only be ensured by derogating upon another protection. For instance, in order to prevent discrimination as a result of predictive policing, it may be considered that a 'fair' AI program will ensure fair outcomes and nullify the effects of any bias within the system or data. However it must be considered the way in which a fair program may be defined. In order to ensure a system is fair, it must be regularly monitored and audited. Effective control of a system is only achieved by including enough data to trace errors.

[109] 'AI Risk Management Framework: Initial Draft' (n 64), at 11.
[110] Joh, "Ethical AI in American Policing."

Similarly, systems which rely on baseline information that is primarily derived from criminal records constructs a universe in which every individual in the system is representative of some level of criminal behavior. This requires that in order to correctly provide a universe that reflects the actual population, all individuals, not just the guilty must be included.[111] By this method population-wide information must be collected and sorted for comparison. Though this may achieve a more fair outcome and meet the protections in place against discrimination, it may run up against the principles and actual regulations on data protection and privacy. As a result, it may only then be possible to ensure the fairness and accuracy of the system by skirting data protection principles and derogating on the right to privacy. This will be discussed at greater length in Chapter 5 in the discussion on data protection and privacy. It will therein be argued that using AI in a manner which we believe to be most efficient and 'fair' may position the rights of anti-discrimination and privacy as mutually exclusive.

The countries selected are chosen due to the variety of legal systems, their varying approaches to criminal justice, and the differing iterations of predictive policing within their criminal justice systems. Differences include the definition of police mandates and the division between investigation and prevention, as in the common law versus civil law systems. This stark distinction is very important to the discussion on prevention versus prediction, as well as the role of the police in generating suspicion and the threshold of investigation. These differences are also critical to what role predictive policing may have in a jurisdiction, where public and private approaches to crime control are mixed. Where crime and delinquency prevention may be considered a matter of public order and intervening in a *flagrante delit* a matter of police mandate in many European countries, in the United States these tasks are shared by both the

[111] Marvin van Bekkum and Frederik Zuiderveen Borgesius, "Using Sensitive Data to Prevent Discrimination by Artificial Intelligence: Does the GDPR Need a New Exception?," *Computer Law & Security Review* 48 (2022).

police and private entities, however all falling within the mandate of criminal justice. Therefore the use and regulation of predictive policing in either location will be necessarily different.

Similarly, the European Union and the several Member States to be included are intended to provide a view of predictive policing under a more robust protection framework, particularly in both the fundamental rights framework as in the discussion on the presumption of innocence, as well as in other regimes, such as data protection. Though policing entities are beholden to supranational law, such as that of the European Union or Council of Europe as regards fundamental rights, states generally regulate their own police. This makes predictive policing much more regulated at the state level. Conversely, the United States offers a very *laissez faire* approach to police regulation and concordantly, the use of predictive policing ahead of regulation or legislation. Lacking national regulation for police, constitutional principles and state law guide the rights of individuals as regards criminal justice while supranational legal instruments are less relevant. The choice to include the United Kingdom is due to its place as a legal hybrid in nature and provides a practical blend of the European and U.S. frameworks. Indeed, though traditionally of less value to include the parent legal system as where the U.S. is concerned, this second common law system shares some of the supranational human rights framework with Europe, but also relies on common law in defining many individual rights. In contrast to the U.S. however, there is national level regulation of policing agencies. In addition, it remains a party to the ECtHR and therefore must meet certain standards while simultaneously building out its data protection regime to allow more intrusive uses of technology.

Finally, these entities are all prominent legal powers in the fight against international crime and therefore to some extent must harmonize their use of criminal justice procedures to the degree that they affect fundamental rights. Questions of jurisdiction and decisions as to whether

pursue predictive policing under criminal, administrative or private enforcement models, will also affect and be affected by the choice of regulatory approach, as outlined above.[112]

Common law versus civil law approaches to crime control

The jurisdictions chosen span both common law and civil, or continental, law systems. The approach taken is one which emphasizes the utility function of predictive policing and the effect of a given framework on its use, as well as on individuals. It is posited that it is not only the law that regulates predictive policing, but also the cultural and criminal justice landscapes in which regulation is conceptualized and applied that dictates its use and the subsequent consequences.[113] Therefore the thesis will not compare the GDPR to the American Fourth Amendment, for instance, but instead the outcome of applying either framework to predictive policing and the effect on individuals. That is to say that by utilizing micro-comparisons of fact patterns within the gambit of predictive policing, so as to isolate differences in legal settings and potentially even identify gaps in regulation between systems, the thesis favors a functional approach to comparative criminal law.[114]

The common/civil law divide will inform much of the manner in which fundamental rights and criminal justice intersect. For instance as already mentioned in the context of American regulation, remedy for a violation of criminal defendants' rights are afforded most often by the courts and from there become law. However this provides a very case by case solution to regulating police misconduct and as a result, the use of police technologies. The need

[112] Markus Dirk Dubber, "Comparative Criminal Law," in *The Oxford Handbook of Comparative Law* (Oxford University Press, 2006).
[113] K Zweigert and H Kotz, 'The Method of Comparative Law', *An Introduction to Comparative Law* (Third, Oxford University Press 1998), at 34, 38.
[114] Gerhard Dannemann, "Comparative Law: Study of Similarities or Differences?," in *The Oxford Handbook of Comparative Law* (Oxford University Press, 2006).

to define a legal problem based on a single proxy claimant may make the application of regulation overly narrow, or too general and broad. Similarly, the role of police officers vis-à-vis prosecutors or investigating judges is defined quite strictly in the civil law systems, which limits the application of certain policing regulations to individuals. This, like the distinction between prevention and investigation, greatly affects the cultural setting in which police interact with citizenry, and necessarily the regulatory approaches to AI technologies.

D. Brief chapter outline of thesis

The thesis will proceed in the following manner in an attempt to concisely and coherently identify the overlaps, tensions, and any successes in situating predictive policing into a legal framework(s).

2. Police and investigation

This chapter will lead the thesis by providing a basic overview of some of the major characteristics of police and policing, distinguishing criminal law from other areas of competence for which the police are responsible. It will go on to discuss the timeline of where crime may be investigated in order to situate the use of predictive analytics and predictive policing temporally alongside the traditional order of an investigation. The chapter will finally compare the methods of the investigation with crime prevention, positing that many of the methods, specifically data collection, are shared and indeed may feed into one long-form investigation in which no crime is necessary to begin the collection of information.

3. Overlapping frameworks: Due process and the presumption of innocence

The presumption of innocence will be explored as a tenet of the criminal justice framework and also as a critical fair trial right. The chapter will explore approaches to the presumption across jurisdictions, weighing the ways in which it may or may not apply to crime prevention and predictive policing. Ultimately it will conclude that the hybrid nature of predictive policing, and the manner in which its utility stretches across prevention and prediction leave individual elements of the presumption as applicable to the practice of predictive policing and others outside the reach of the principle.

4. Misaligned thresholds: Triggering rights and quantifying suspicion

This chapter will assess how predictive policing changes thresholds of rights' applications and police suspicion. First, the chapter analyzes the temporal shift of prevention out of the criminal law process. As a result, though police may employ tactics arguably similar to that of an investigation, no rights are afforded to individuals subject to predictive policing prior to the issuance of an arrest or charge, despite notable collateral consequences. Next, it will analyze and categorize the various thresholds to suspicion, what they entail, and how prevention and prediction vary in calculating suspicion, namely in the U.K. and the U.S. It will be posited that discretion, altered by the use of a risk assessment, changes the applicable rules for police as well as the applicable legal framework in which suspicion is rightly assessed. As suspicion crosses from a public order approach to prevention, as may be referred to as 'ordinary suspicion,' suspicion as inferred in predictive policing becomes a machine generated suspicion in which AI both identifies correlation considered to amount to suspicion and generates a new form of suspicion that pushes prediction into the criminal justice framework as prevention.

5. Tensions within the fundamental rights framework: Anti-discrimination and data protection

Complimentary to the criminal justice framework, this chapter will explore the rights against discrimination and to data protection and the effects of predictive policing on their applications. It will first assess the right to anti-discrimination in the CoE through the lens of the Netherlands, due to its relatively strong use of predictive policing relative to other European countries. The chapter will additionally explore the parallel legal regime of equal protection in the U.S. These analyses will highlight the ways in which predictive policing, specifically with AI, exacerbates the effects of bias in policing, leading to increased discrimination against individuals and groups.

The chapter next looks at the way in which predictive policing may infringe upon the right to data protection as defined in the EU, weighing the benefits and inadequacies with the existing framework in the form of the LED and GDPR. The U.S., which does not have a comparable right to data protection, will also be assessed for a comparative view of the effects of predictive policing and privacy there. Finally, the chapter assesses the method of curing biases through the use of extraneous data to audit algorithms and increase output accuracy, implicating data protection laws in an effort to alleviate discrimination.

6. Piecing it together: Analysis of 'a predictive policing framework'

With the respective conclusions of the preceding chapters, this analysis will seek to ascertain what legal framework is applicable to predictive policing and how it applies. It will weigh the criminal justice and human rights effects on individuals as a result of the practice and suggest the protections which may be the most relevant. With these conclusions it will also be

possible to evaluate whether either the compliance/regulatory approach as in preventing financial crimes, or the blurring of administrative and criminal approaches also seen in counterterrorism enforcement, are appropriate categorizations for the framework necessary to appropriately encapsulate the practice of predictive policing. It will also analyze these findings against the foregoing introductory discussion of the policy frameworks in the various jurisdictions at the time of writing, to suggest a way forward.

Chapter 2: Policing, Prevention, and Criminal Investigation

A. Introduction

This chapter will open with a discussion on the role of modern policing, positing that its objective, as inclusive of maintaining security and public order, has expanded in recent decades. This expansion has caused a shift toward crime prevention as a means of crime control. It is posited that simultaneously to prevention as increased security, police endeavor to act more efficiently both in fighting crime and as regards resources. An increased emphasis on efficiency has also coincided with an explosion of data driven technologies, among them artificial intelligence (AI). These tools have redefined the role of police further, leading to a bigger emphasis on predictive policing to execute crime prevention.

The chapter continues by first briefly describing the evolution of criminal investigation, particularly in light of developing technology. It will second outline the elements of a 'traditional' criminal investigation[1] and the elements of predictive policing for a comparative analysis. Finally, it is asserted that the described emphasis on prevention as crime control, as well as rapidly developing technology, have pushed the methods traditionally reserved for criminal investigation into the sphere of crime prevention. Therefore, the traditional investigation, which follows the commission of a crime, and the predictive investigation which precedes crime, may be best distinguished temporally, rather than by differences in practice. It follows that legal protections should be accordingly extended to the subjects of preventative

[1] This work uses the term "traditional" criminal investigations to refer to the most commonly cited form of investigatory tools, dispatched subsequent to a crime event. 'Traditional' is purposely employed to note that the common perception of investigations and their legal interpretation do not generally include those which are preventative in nature.

investigations. In concluding the chapter will provide a brief overview of AI and categories of data, as well as some of the potential flaws in their use for predictive policing.

B. Police & policing

The modern police as an entity is defined as the authority tasked with crime control, order maintenance, and security management;[2] spread over multiple agencies each with a specific role.[3] This authority is conferred upon it by the state, stemming from the duty of the state to protect its citizens against harm.[4] The authority is accorded to specific agencies via legislation, judicial decisions, or executive acts.[5] The police powers conferred by these acts of authority range from highly generalized, to direct and specific. Police authority is vested with the ability to enforce the law via legal sanctions against individuals, in addition to the power to use arrest, detention, and other coercive means when appropriate.[6] In many common law systems, such as in the U.S. and U.K. analyzed herein, discretion extends to the ability to determine when to enforce law via sanction, coercion, or not all, as a means of efficiency.[7] It may be argued that the discretion with which available enforcement acts are utilized, increases practical police power beyond the letter of the law.[8] The result of this panoply of goals, tools, and power is similarly subject to patchwork levels of regulation and enforcement.

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[2] Innes, *Understanding Social Control: Deviance, Crime and Social Order* at 65.
[3] Ross Coomber et al., *Key Concepts in Crime and Society*, Key Concepts (Sage, 2014) at 155-157.
[4] Ashworth and Zedner, "Prevention and Criminalization: Justification and Limits" at 543.
[5] Andrew Sanders and Richard Young, "Police Powers," in *Handbook of Policing*, Second (Routledge, 2008) at 281.
[6] Tim Newburn, "Crime Reduction and Community Safety," in *Handbook of Policing* (Routledge, 2008) at 342-344.
[7] Kevin Cyr, "The Police Officer's Plight: The Intersection of Policing and the Law," *Alberta Law Review* 52, no. 4 (2015): 889–926.
[8] Sanders and Young at 298.

1. Police and policing goals

The terms 'police' and policing' are often used interchangeably, however they refer to separate concepts and they are neither synonymous nor mutually exclusive. Their use is further not limited to the realm of criminal law enforcement but a range of legal authorities that govern acts which may nevertheless be relevant to crime control. The term *policing* may be defined as "the act of upholding the law, maintaining order, preventing crime and offering a range of support services to the public."[9] Police share the act of policing with private and other public sector entities.[10] The legal framework for ensuring security may be considered as built upon a multi-faceted aggregation of functions distributed amongst a body of multiple entities that though separate in authority, work together toward a single goal.[11] The legal authority for policing is derived of both civil and criminal law, regulatory schemes, and administrative code. Examples of this overlap includes public health agencies, or the regulatory arms of agencies tasked with corporate compliance.[12] Where a particular act as carried out by an individual may violate a criminal code, or within the same incidence a municipal regulation; the same act by a corporation may violate civil regulation. Context and detail therefore inform the character of law enforcement. Each of these enforcement mechanisms, geared at security, potentially govern the same acts and may be policed in a number of manners.

Criminal law, and criminal justice specifically, are further shaped by the institutional elements of criminalization. Whereas criminal law is the formally established doctrine applied to individuals and groups provide the state a legal basis to prohibit activities constituting a wrong-

[9] Coomber et al., *Key Concepts in Crime and Society* at 157.
[10] Martin Innes, "The Art, Craft, and Science of Policing," in *The Oxford Handbook of Empirical Legal Research*, Oxford Handbook (Oxford University Press, 2010) at 11-15.
[11] Haggerty and Ericson, "The Surveillant Assemblage" at 608.
[12] Lacey, Wells, and Quick, *Reconstructing Criminal Law* 4-5.

doing; the practice of criminalization is then the institutionalization of the criminal law through practice. Criminal law enforcement in practice occurs at several levels, with the interpretation and implementation of law occurring through judicial and prosecutorial performance, as well as police action. These practices are "nested" within specific institutions, structured according to criminal procedure, constitutional and administrative law, and according to the relevant, responsible authorities.[13] Furthermore, crime control and prevention vary according to the heterogeneity inherent in communities and across areas of criminal activity.[14] Criminalization and crime control can therefore be understood as dictated through a division of labor.[15] Police power and discretion are a part of the criminalization process of criminal law and as discussed below, retain a level of malleability as exercised by individuals.[16]

The majority of police interactions proceed peacefully by consent, due to a general perception of police legitimacy.[17] The power of police to restrict one's liberty, though a weighty one, is considered a necessary component to the safety and freedom of the population.[18] Because police powers put a limit on the state's positive duty to ensure individuals' fundamental rights,[19] it is expected and understood that with this power comes a high standard of care and diligence in the lawful execution of their duties.[20] Standards such as that of reasonable suspicion put the onus on a police officer to exercise sufficient caution before taking coercive measures against an

[13] Lacey and Zedner, "Legal Constructions of Crime" at 160-163.
[14] Sklansky, "Police and Democracy" at 1810-1811.
[15] Crawford and Evans, "Crime Prevention and Community Safety" at 770.
[16] Phillip Atiba Goff, How Police Reports Became Bulletproof, NPR All Things Considered, May 26, 2021, https://www.npr.org/2021/05/26/1000598495/how-police-reports-became-bulletproof.
[17] Tim Newburn, "Police Powers," in *Handbook of Policing* (Routledge, 2008) at 281; Sanders and Young, "Police Powers."at 281; National Research Council, *Fairness and Effectiveness in Policing: The Evidence* at 308-312.
[18] Haggerty and Ericson, *Policing the Risk Society* at 53. *See also*, Jones, "Governing Security: Pluralization, Privatization, and Polarization in Crime Control and Policing" at 759.
[19] Hirsch Ballin, *Anticipative Criminal Investigation* at 8-12; 553-557.
[20] Mike Maguire, "Criminal Investigation and Crime Control," in *Handbook of Policing* (Routledge, 2008) at 432-435.

individual. Though the chasm between rule of law policing and due process policing has been well documented, there is intended to be a balance.[21] The use of discretion by officers is therefore formulated to strike the balance between the force necessary to enforce the law while also ensuring the protection of liberties of the individual.[22] Beyond the requirement that police exercise legitimate aims with due gravity, certain protections against arbitrary punishment are ensured by the judicial system through which police are held accountable to constitutional standards.[23] These principles are necessarily components of the multi-faceted enforcement framework to which police are subject.

C. Prevention

As described, public security is one of the responsibilities of police. It takes many forms, ranging from monitoring traffic violations and promoting tranquility, to investigating violent crime.[24] Traditional, or popular understandings of security are those that prioritize crime control and the enforcement of criminal law. In recent decades the notion of security has evolved into a larger concept, more widely encompassing of diverse police objectives.[25] Whereas crime control has traditionally been aimed at the reactive enforcement of law as a means of general and specific deterrence, current conceptions of security are forward thinking and focused on the proactive prevention of crime.[26] Crime reduction may be a means of crime control, but it is also

[21] *See* Herbert Packer, "Two Models of the Criminal Process," *University of Pennsylvania Law Review* 113, no. 1 (1964).
[22] Newburn at 283-284.
[23] Sanders and Young, "Police Powers" at 284.
[24] Ulrich Sieber, *Alternative Systems of Crime Control; National, Transnational, and International Dimensions*, Reports on Research in Criminal Law, S 161 (Berlin: Dunker & Humblot, 2018) at 3-5.
[25] *See* Garland, *The Culture of Control*.
[26] Id; Jones, "Governing Security: Pluralization, Privatization, and Polarization in Crime Control and Policing" at 745-749.

an aggregate of crime prevention.[27] According to emerging views of criminology, the most effective way to prevent crime is to determine why crime occurs as it does, and then into which precedent acts intervention is appropriate.[28] By this view of security, crime prevention requires the targeting of precursor acts, rather than a focus on harm.[29] In other words, if traditional enforcement methods focus on the end goal of crime reduction, prevention is the means to that end.[30] The term security not only encompasses a widening range of tasks, but it also includes actors beyond formal police authorities.[31] Crime prevention then falls within a construct in which policing is less about the entity of the police as a single institution and more about the provision of security.[32] This thesis addresses the act of policing by the police, for the objective of crime prevention.

1. Theories and modes of prevention

In addition to theoretically increased security through the avoidance of harms, crime prevention is considered more resource-efficient than responding to an individual call for assistance, subsequently investigating a crime, and then if successful, finally dispensing punishment.[33] Prevention is considered a form of risk management based on a prioritizing of the precedent act rather than the outcome, the crime itself.[34] By seeking to prevent crime before it

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[27] Byrne and Pease, "Crime Reduction and Community Safety" at 355; making the analogy of crime prevention to preventative medicine.
[28] Lucia Zedner, "Pre-Crime and Post-Criminology?," *Theoretical Criminology* 11, no. 2 (2007): 261–81. at 265.
[29] Byrne and Pease, "Crime Reduction and Community Safety" at 344; Sieber, *Alternative Systems of Crime Control; National, Transnational, and International Dimensions* at 5.
[30] Tilley, "Modern Approaches to Policing: Community, Problem-Oriented and Intelligence-Led" at 380.
[31] Zedner, "Pre-Crime and Post-Criminology?" at 262; Despite the shared powers for security, most European systems remain hierarchal, with the state maintaining power over policing entities. In North America it may be argued that the various security apparatus share power with the state more equally. *See* Innes, *Understanding Social Control: Deviance, Crime and Social Order* at 78.
[32] Valverde and Mopas, "Insecurity and the Dream of Targeted Governance" at 234-235.
[33] Innes, "The Art, Craft, and Science of Policing" at 26.
[34] Mike Maguire, "Criminal Investigation and Crime Control," in *Handbook of Policing* (Routledge, 2008), at 455.

can occur the risk is spread across the population and better managed; which if successful, should ensure greater efficiency and enhanced security. One method for preventing crime is to limit opportunities and to address systemic drivers of crime.[35] It is widely established in criminology that the main drivers of crime "lie outside policing and criminal justice" and require attention to matters external to traditional concepts of policing.[36] This accounts for a "criminalization of social policy," whereby non-criminal acts may be seen as crime generators.[37] A prime example of this approach to policing is "Broken Windows" policing, as was infamously implemented in New York City in the 1990s.[38] The logic behind Broken Windows was that to limit quality of life infractions would make crime less likely, as an environment affects and may even foster crime.[39] Crime prevention as such may be argued as a form of non-specific deterrence, centered on the ambiguous, ever present risk of crime. The effect of police deterrence by attention to non-criminal acts may be compared to a compliance-based approach to law enforcement, in which the management of risk factors themselves non-criminal, are at the crux of enforcement.[40]

The effort to enhance crime prevention is not only spread across institutions, actors, and areas of law, but also adapts the act of policing.[41] Though the use of an arrest has traditionally been as a result of a criminal investigation for identifying a specific individual,[42] the use of arrests has increasingly become a pre-emptive tool in the crime prevention toolbox.[43] Similarly,

[35] Tilley, "Modern Approaches to Policing: Community, Problem-Oriented and Intelligence-Led" at 375.
[36] Byrne and Pease, "Crime Reduction and Community Safety" at 343.
[37] Adam Crawford and Karen Evans, "Crime Prevention and Community Safety," in *The Oxford Handbook of Criminology*, Fifth, Oxford Handbook (Oxford University Press, 2007) at 773.
[38] Innes, "The Art, Craft, and Science of Policing" at 18-19.
[39] Valverde and Mopas, "Insecurity and the Dream of Targeted Governance" at 243.
[40] Haggerty and Ericson, *Policing the Risk Society*.
[41] Valverde and Mopas, "Insecurity and the Dream of Targeted Governance" at 237-238.
[42] Reilly, "Criminal Investigation Defined" at 3-4.
[43] Newburn, "Police Powers" at 285-286.

second generation forensic technology, for instance, is no longer relegated to criminal investigations, but instead may be used for the prevention of crime. Not discussed in this thesis, this expansion also coincides with an increase in the criminalization of inchoate acts.[44] In the case of a civil sanction for what would also be classified as a criminal act, a formal charge may bring lesser legal protections to the subject or defendant than a criminal sanction.[45] The new emphasis on crime prevention has enlarged the categories of criminal investigations to include "persons of interest" or "pre-suspects."[46] Indeed the traditional "harm plus culpability" model is replaced with an more inclusive model that does not require an act causing harm.[47]

2. Evolution of criminal investigations

In addition to changes in policing, the focus on security widens the scope of perceived risk and in turn requires greater efficiency to effectively meet the need. Efficiency in this context is considered the "precise targeting of places and populations…to effectively fight or deter crimes."[48] The prioritization of efficiency has two rationales. The first and foremost is the reduction of harm by thwarting crime before it can occur, termed here 'objective efficiency.' The logic of objective efficiency fits the definition of security as described; if the objective is to reduce crime, success is measured by less crime occurring. In order to be efficient in terms of crime reduction policing must be accurate and successful, requiring precise means of policing. This is tied to the second manner of efficiency, and that is efficiency of resources or 'operational efficiency.' Technology has been determined an appropriate tool for reducing crime, through

[44] Sieber, *Alternative Systems of Crime Control; National, Transnational, and International Dimensions* at 5, 27.
[45] Aleš Završnik, "Algorithmic Justice: Algorithms and Big Data in Criminal Justice Settings," *European Journal of Criminology*, 2019.
[46] Sieber, *Alternative Systems of Crime Control; National, Transnational, and International Dimensions* at 29.
[47] Ashworth and Zedner, "Prevention and Criminalization: Justification and Limits" at 546.
[48] Nick Lally, "'It Makes Almost No Difference Which Algorithm You Use': On the Modularity of Predictive Policing," *Urban Geography*, July 2, 2021 at 6.

increased objective and operational efficiency, without straining precious resources.[49] The increasing demands on police enlarge their workload at a time when many police agencies are facing reduced funding. [50] The practice of predictive policing as discussed below, is meant to capture both aspects of efficiency.

Though technology is intended to increase efficiency, it does so in a way that stretches the chasm between theory and practice by creating an artificial modularity.[51] For the purposes of this thesis, a modularity is defined as a transferable method applicable across contexts and may play out in one of two ways. Generally in the case of common law systems, such as the U.S. or the U.K., police officers are afforded a wide latitude of discretion, by which they may determine what acts require the issuance of legal sanctions or criminal charges. As will be discussed below, the use of risk assessments in a modular fashion will affect discretion and decision-making. Discretion is the professional, human judgement made in accordance with the legal framework, that is, discretion is not exercised in a vacuum.[52] Taking the examples of driving under the influence or domestic violence, a police officer may choose which laws to enforce, as the relevant laws and regulations violated by these acts may invoke both civil and criminal liability.[53] Similarly, police use their discretion for determining where coercive force is necessary.[54] As will be argued in Chapter 4, technology such as risk assessments supplant a

[49] Charlie Beck, "Predictive Policing: What Can We Learn from Wal-Mart and Amazon about Fighting Crime in a Recession?," *The Police Chief*, March 13, 2014.
[50] Beck.
[51] Lally, "'It Makes Almost No Difference Which Algorithm You Use': On the Modularity of Predictive Policing."
[52] Marciniak, "Data-Driven Policing: How Digital Technologies Transform the Practice and Governance of Policing" at 31-35, *quoting* Dworkin, D. *Taking Rights Seriously*, London (1977). Dworkin compares discretion to the hole of a donut, stating that without the pastry surrounding the hole, it is little more than boundless space, without meaning or definition.
[53] Nicola Lacey, Celia Wells, and Oliver Quick, *Reconstructing Criminal Law*, Third (Cambridge University Press, 2003) at 4-5.
[54] Cynthia Lum and Christopher Koper, *Evidence-Based Policing; Translating Research into Practice* (Oxford University Press, 2017) at 78.

degree of officer discretion.[55] By using a predictive assessment, officers are instructed where to patrol, what may be found there, and ultimately their anticipation is dictated by the technology and informs their subsequent interactions. If fully realized, such a purposeful reliance on technology could be categorized as "policing by human absence."[56] As will be later argued, the use of risk assessments though a tool intended for efficiency, irretrievably alters the building of suspicion by applying a modular methodology devoid of context.

Crime prevention, unlike reactive means of crime control takes place outside the formal bounds of the criminal justice system.[57] Where police officers are managing security in terms of crime control, the acts of police, even outside the realm of criminal law, are the first step in the criminal justice process for many individuals.[58] The powers afforded police, such as that of arrest and search, confer much more general and potentially coercive power than is evident in a literal reading of law and may be employed in a variety of manners.[59] The investigation stage of policing is a point in the process of criminal law enforcement that consists of multiple tasks, tools and goals, all of which are driven by the need for information. In criminal investigation there may be a stark distinction between process (tools or methods used) and result, whereas at other times process can be the result in itself. For instance, police may investigate a crime for reasons beyond the intent of securing an individual conviction, such as in order to capture information on crime patterns and threats to public safety. In this case the investigation may be both the process and the result. Similarly, arrest may be used as an investigatory tool or as a

[55] Nick Tilley, "Modern Approaches to Policing: Community, Problem-Oriented and Intelligence-Led," in *Handbook of Policing* (Routledge, 2008) at 374.
[56] Haggerty and Ericson, *Policing the Risk Society* at 45.
[57] Brandon Welsh and David Farrington, *The Oxford Handbook of Crime Prevention* (Oxford University Press, 2012) at 3.
[58] Martin Innes, *Understanding Social Control: Deviance, Crime and Social Order* (McGraw-Hill Education, 2003) at 64.
[59] Tim Newburn, "Police Powers," in *Handbook of Policing* (Routledge, 2008) at 298.

means of ensuring security by precluding opportunity for flight or the destruction of evidence.[60] The evolving uses of these tactics is part of the larger paradigm shift in crime control, in which proactive risk management is prioritized over investigating singular acts of crime.[61] This approach requires the prioritization of information in order to mitigate risk factors and intervene in drivers of criminal behavior.[62] As a result, the shift in policing is further fueled by the myriad data available and the rapidly growing field of information management.

The second manner in which theory and practice are blurred applies to continental systems of policing broadly. As will be discussed in the following sub-section, the use of AI programs to predict crime necessarily requires the large-scale collection of data and sorting of the same. This enables and encourages police to use forensic methods, data, and available intelligence to strategically take proactive measures against particular categories of crime.[63] Often these categories of information mirror those which may be sought after in the course of a criminal investigation, but in this manner are subsequent to the commission of a crime. The misalignment of legal standards to *de facto* investigation occurs wherein investigatory tactics are used to monitor individuals' behavior, but due to the lack of a formal investigation, protections do not automatically apply. Where a derogation may occur, as in the case of privacy or data protection, due to the large scale collection of information, it should meet the requirements of

[60] David Carson, "Models of Investigation," in *Handbook of Criminal Investigation* (Routledge, 2007), 403–25 at 411-412.
[61] Tom Williamson, Tim Newburn, and Alan Wright, "The Future of Investigation," in *Handbook of Criminal Investigation* (Routledge, 2007), 652–56 at 653.
[62] Haggerty and Ericson, *Policing the Risk Society*.
[63] This work uses the terms preventative, preventive and proactive in order to describe the method of policing under which predictive policing falls. The first two are used interchangeably as either noun or verb. The term proactive refers to policing which often takes the form of deterring perceived risks of crime, as a means of prevention (or a preventative/preventive act). Proactive is contrasted with retroactive. Preemptive is avoided in this work as it implies the imminence of an event's occurrence, which in predictive policing cannot be ascertained. See Nick Lally, "'It Makes Almost No Difference Which Algorithm You Use': On the Modularity of Predictive Policing," *Urban Geography*, July 2, 2021 at 5-6.

proportionality to public safety and necessary to prevent further harm. However in the case of predictive policing in which there is no crime or suspect and there is no known, imminent threat, such a derogation on the rights of individuals may be unlawful, as explored in Chapter 4.

i. Elements of criminal investigation

It is argued herein that the distinction between crime prevention and investigation in practice is tenuous in light of the aforementioned developments, and as a result the thesis refers to preventative investigation and traditional investigation. Criminal investigation in both the traditional sense as well as the preventative sense is at its core defined as the interpretation, ordering, and representation of information so as to infer new knowledge. It may be characterized as having three main elements: it is ordered and routinized; it is information centered; and the result is an "artefact" of police work.[64] The term artefact is a purposeful highlighting of the human construction of a crime narrative and record, as the result of investigation. The ability of the police to design the narrative largely influences the manner in which it will be interpreted when absorbed into a legal paradigm.[65] These constructed narratives are thereby made actionable when imbued with legal meaning. Criminal investigation is therefore the genesis of a narrative, to be legally interpreted, based on the synthesis of information. As discussed in the following chapters, inconsistent uses of data may affect the design and interpretation of the information.

There are numerous techniques employed in the criminal investigation which may be used in the preventative or retroactive form. The example given here for drawing a parallel to

[64] Martin Innes, "Investigation Order and Major Crime Inquiries," in *Handbook of Criminal Investigation* (Routledge, 2007), 255–76 at 257.
[65] Mike Maguire, "Criminal Investigation and Crime Control," in *Handbook of Policing* (Routledge, 2008) at 436.

predictive policing is criminal profiling. Profiling is a widely recognized information-driven tool used by police in criminal investigations to create a narrative that guides further action. It is the term used to describe "a collection of various scientific and psychological theories and techniques that attempt to draw inferences about an offender's characteristics by examining the behavior exhibited in a crime scene."[66] In so doing, police are able to narrow the pool of suspects and open up new channels of inquiry. There are four steps that are used in most profiling: 1. Assess an act against those who have previously committed similar acts; 2. Analyze the crime scene for information; 3. Analyze the victim and likely suspects for detail; 4. Establish possible motivations for the crime.[67] Traditionally this approach falls under the "harm plus culpability" framework for defining crimes and is individual suspect-centered. In predictive policing, the same steps are taken to identify the profile of past crimes and perpetrators to also identify the individuals and environments which share that profile. As profiling is increasingly used in a preventative sense, wider categories of crime proliferate and veer further from this traditional harm plus culpability framework.[68] Like an inchoate offense, which defines an act precursor and *de facto* proxy to a crime as an offense, predictive policing similarly emphasizes the precursor factors which in themselves are not indicators of imminent harm but which meet the profile of past offenses.[69]

[66] Laurence Alison, Clare McLean, and Louise Almond, "Profiling Suspects," in *Handbook of Criminal Investigation* (Routledge, 2007) at 493-495.
[67] Alison, McLean, and Almond at 496.
[68] Andrew Ashworth and Lucia Zedner, "Prevention and Criminalization: Justification and Limits," *New Criminal Law Review* 15 (2012): 542–71 at 544-548.
[69] Ashworth and Zedner at 559.

D. Elements of Predictive Policing and Risk Assessment

Profiling in a preventative sense very much mirrors the above description of criminal profiling in that the same categories of collected information are used to infer new information not to construct the narrative of a past crime, but to anticipate future crime.[70] Therefore, the difference largely hinges on relative temporality. Using the above definition of investigation, preventative investigation mirrors traditional investigations in the following manner: 1. Identify individuals who may be more likely to commit a crime by virtue of having previously committed the crime in focus; 2. Assess the environment in which a crime occurs to extract patterns in the factors that recur across repeat incidents of a type of crime; 3. Assess victims and perpetrators of past crimes to identify the traits that are recurring across incidences of crime; 4. Assess the facts surrounding past incidents of a crime to ascertain how these correlations may indicate motivation or opportunity for crime. When presented in plain view, it is very clear that the definition of investigation holds up against the analysis inherent in predictive policing.

It is here asserted that a traditional and preventative investigation are primarily distinct in their temporal place in police work, rather than in practice or effect. Much like a traditional investigation which is the collection and synthesis of relevant information, proactive investigation is the reduction of uncertainty as to the details of a crime so as to prevent its occurrence, rather than retroactively filling in the details. By investigating crime, information is gleaned that informs both further investigation and subsequent police work. This is true for the decision making process in a traditional investigation by which a low information setting may develop with further investigation and behavior is adapted to the new information.[71] Similarly, in predictive policing the use of investigatory findings direct police behavior from a low

[70] *Supra Note* 12.
[71] Innes, "Investigation Order and Major Crime Inquiries" at 270.

information setting to a more directed form of crime deterrence. Either investigation may induce police action against an individual, cause an individual to become a suspect, and ultimately will affect any criminal charge or trial process.

Finally, the distinction between information that is collected and assessed for either investigation or prevention can be quite fluid and data once collected often fulfills both purposes.[72] Police data is collected for the record keeping of individual agencies and officers, which allows for the monitoring of efficiency. Crime statistics so recorded form an important aspect of police management that allows officers to prioritize particular threats to public safety that re-occur, as well as to identify issues which may be resolved in favor of lowering crime. Similarly, statistics inform larger understandings of crime at a national level which is frequently the fodder of political discussion and debate. These statistics are varied in the way which they are collected and vastly affected by the individual officer making the record. Therefore, crime data are far from uniform in the way in which they are collected and for what purposes. Data collected in the course of an investigation may be kept in a complimentary database to that where proactively collected data are stored if not the same database, all accessible to officers. It is therefore argued that generally, analyses of collected data do not differentiate between whether investigatory techniques are used in advance of a crime or to solve its earlier commission.[73]

The goal of predictive policing is to provide law enforcement agencies the necessary information to prevent crime events, with the long-term goal of lowering crime rates. The predictive aspect is the result of sophisticated analytical techniques formed in AI, that inform policing agencies where the highest calculated risk for crime occurs and to direct police

[72] Maguire, "Criminal Investigation and Crime Control" at 456, referring the National Intelligence Model in the United Kingdom.
[73] Ira Flatow, "How Imperfect Data Leads Us Astray with Kasia Chmielinski," Science Friday, accessed August 19, 2021, https://www.sciencefriday.com/segments/imperfect-data/#segment-transcript.

intervention accordingly. Though crime itself cannot actually be predicted, this method of policing is intended to allow for the most efficient allocation of police resources by targeting the most relatively probable risks. Risk is defined as the quantified likelihood that an event will happen, based on known relevant factors.[74] The predictive analysis draws from large data sets to perform advanced calculations including numerous forms of statistical modeling, regression, and classification.[75] Ultimately, the risk assessments rank results to identify where is 'high' risk. It is important to reiterate that the risk scores provided are relative. Because the prediction is a probability of an unknown event, the level of risk is considered high if as compared with the probability of other subjects.

This relative weighting of potential future events is one of the problematic aspects of predictive policing. Because risk is weighted only relevant to other occurrences and other subjects, the assessment says very little about a potential occurrence itself. In addition, risk assessments are based on correlations in data, therefore there is no way to show causality between the perpetrating of crime and risk factors. This presents difficulties in assessing the success or failure of a predictive policing program. Though a change in crime rates after the implementation of predictive policing may be plausible to attribute to the use of risk assessments, there is no causality between crime and the risk assessment and therefore to measure something which did not happen (as in the case of a dropping crime rate), the exact factors which caused the change are unseen and unmeasurable.

[74] Kennedy, Caplan, and Piza, "Risk Clusters, Hotspots, and Spatial Intelligence: Risk Terrain Modeling as an Algorithm for Police Resource Allocation Strategies." at 343.
[75] Hardyns and Rummens, "Predictive Policing as a New Tool for Law Enforcement? Recent Developments and Challenges" at 202; *see also* Perry et al., *Predictive Policing*.

There are various methods of predictive policing, each predicated on different subjects and levels of analysis.[76] For the purpose of this thesis, the various methods are divided into two broad categories, assembled according to whether the goal of the prediction is to assess the risk of a crime by location, or as attributed to a potential perpetrator of crime (individual risk). Individual-based analysis is to date less frequently used and therefore has been less studied. Regardless, the thesis argues that its use gives rise to numerous potential violations of due process unique from place-based risk assessments and therefore requires its own close analysis. As the following sections will demonstrate, law enforcement agencies' tactics taken subsequent to the output of a risk assessment as well as the subsequent legal consequences vary considerably. The following sub-sections will detail the methods by which place-based and individual-based predictions are formed, and the common challenges that affect both methods.

1. Place-based predictions

One of the earliest iterations of predictive policing is hotspot analysis, also called cluster or heat mapping.[77] Despite small, technical variations, the two will collectively be termed here, crime mapping. Crime mapping is the macro- or micro-level approach by which past crime statistics are compiled to show clusters or hotspots on a map with the expectation that areas where crime has previously clustered indicate where the risk of future crime is the highest.[78] Crime mapping is often most successful for property crimes, which are often crimes of opportunity against strangers and subject to general deterrence, as opposed to violent crime

[76] For an accessible discussion on the terminology and differing types of analysis, see United States National Institute of Justice, "Crime Mapping & Analysis Program Extra Reading Material, Intermediate Crime Mapping Using ArcGIS 10.1."
[77] Kennedy, Caplan, and Piza, "Risk Clusters, Hotspots, and Spatial Intelligence: Risk Terrain Modeling as an Algorithm for Police Resource Allocation Strategies."
[78] Hardyns and Rummens at 203. *See also* Eck and Weisburd, "Crimes Places in Crime Theory" at 2-3.

which is spontaneous, less predictable, and more likely to be underreported.[79] Property crimes often occur due to the attractiveness of a target and therefore provoked to repeat offences. For instance, after a successful burglary an offender may view houses with similar layouts or on a street with a common point of egress as a lower risk for being caught. In other words, a near-repeat offence is predicated by some association between targets, just as seen in charting the spread of biological contagions.[80]

Crime mapping is possible using simplistic, or heuristic, mapping strategies such as pushing pins into a map or color-coding locations.[81] Generally crime maps are areas broken down by some demarcation which allows for easy, quantifiable, identification such as neighborhood boundaries or streets. Though a generally sound approach, hotspots do not necessarily fill the jurisdictional boundaries as determined on a map but instead these bounds may be seemingly random in the context of crime.[82] Crime mapping must therefore take account of urban design and characteristics, which are much more intricately detailed than broadly drawn boundaries, and has led to predictive methodologies that are more concise on the micro-level.[83] Indeed, it has been found that up to half of a city's crime occurs in one to three percent of its space, demonstrating the need for a finely calibrated form of measurement.[84] Though conventional mapping still provides a sound baseline for predicting some forms of crime, the below discussion of AI for predictive analytics describes a more advanced approach to the theory

[79] Hardyns and Rummens, "Predictive Policing as a New Tool for Law Enforcement? Recent Developments and Challenges" at 205. *See also*, For a chronology of predictive policing, as well as the progression of its predictive uses, see Ferguson, "Policing Predictive Policing."
[80] Guthrie Ferguson, "Policing Predictive Policing" at 1129.
[81] Perry et al., *Predictive Policing* at 26.
[82] Perry et al., *Predictive Policing* at 26-29.
[83] Eck and Weisburd, "Crimes Places in Crime Theory."
[84] Weisburd, "The Law of Crime Concentration and the Criminology of Place." at 3.

of crime and place, building on earlier methods with the added benefit of advanced technology and the ability to include large amounts of data.[85]

Modern approaches to place-based predictive policing build on the core theories of crime mapping, but purportedly allow for better precision through the addition of new data points. One such theory uses environmental factors to make predictions about likely locations for crime. This approach, like in predictive seismology in which earthquakes and aftershocks are predicted to occur along fault lines or in clusters, posits that crime is also a result of "built-in" environmental features.[86] Therefore with large inputs of data, it is theoretically possible to get a micro-level picture of the "built-in" opportunities for crime that reflect relevant environmental factors. This takes crime mapping and puts it both on a multi-dimensional level, but also emphasizes the need for micro—targeting.[87] Some of the prominent theories informing micro-level place-based policing include rational choice theory (one will only commit a crime for which the benefits exceed the costs);[88] routine activity theory (crime is the function of a convergence of offender, time, and place);[89] distance decay theory (most perpetrators will commit crimes at a diminishing rate as getting further from home or an "anchor point");[90] near-repeat theory (once a perpetrator

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[85] Kennedy, Caplan, and Piza, "Risk Clusters, Hotspots, and Spatial Intelligence: Risk Terrain Modeling as an Algorithm for Police Resource Allocation Strategies." at 354. Density mapping can be useful for developing intelligence that informs general deterrence, e.g. rather than targeting a particular block or crime, police may have a large presence for general suppression of crime in a dense crime area. Kennedy et. al illustrate this point with the example of pooling blood tests by groups of ten ("compressing the samples"), so to limit the number of individuals who must be tested. This works best when the sought after result (here, crime) is sparse among the population.
[86] Hvistendahl, "Can 'predictive Policing' Prevent Crime before It Happens?" See also, Lum and Isaac, "To Predict and Serve?" at 18.
[87] For a more in-depth discussion of the statistical methods that are used for crime mapping, *see* Perry et al., *Predictive Policing*; also George, "Predictive Policing: What Is It, How It Works, and Its Legal Implications."
[88] Eck and Weisburd, "Crimes Places in Crime Theory." *See also* Jones, *Criminology*.
[89] Koper, "Just Enough Police Presence: Reducing Crime and Disorderly Behavior by Optimizing Patrol Time in Crime Hot Spots." *See also*, Eck and Weisburd, "Crimes Places in Crime Theory." at 5, for a discussion of the three requirements of routine activity theory: motivated offender, desirable target, convergence in time, and absence of guardian. Routine activity theory is similar to crime pattern theory, or environmental criminology, which posits that the distribution and interaction of perpetrators and victims or targets across time and space informs criminal behaviors, s*ee also* Welsh and Farrington, *The Oxford Handbook of Crime Prevention* at 322.
[90] Eck and Weisburd, "Crimes Places in Crime Theory" at 16-19, for a discussion on offender mobility; *see also* Grierson, "The Hound of the Data Points." at 3-4, for an explanation of the "least effort" principle.

finds that particular location is a successful target he is likely to return to similar targets);[91] and criminality of place (places act as crime attractors, opportunities, or crime generators).[92]

The encapsulation and application of these theories can take several forms, but are most commonly used in Risk Terrain Modeling (RTM)[93] and geographic information systems (GIS).[94] More sophisticated forms of mapping, RTM and GIS function on a multi-dimensional modeling system meant to provide an "abstraction of the real world."[95] The model is composed of an area map which is parceled into small cells of a set dimension and assessed for the "presence, absence, or intensity of qualities," that is any temporal, social, physical, or behavioral factors that may contribute to crime.[96] Unlike less sophisticated crime mapping above, the cells used in these methods may be quite small and vary by application, rather than using pre-existing boundaries unrelated to crime.[97] The presence of each particular quality is measured on a single layer of the map, the layers are then stacked over one another to provide a multi-layered map that can point to high risk areas for crime events based on the commingling of measured qualities.[98] This forms a micro-level hotspot model, based on a multitude of sophisticated data sets in a multidimensional visualization. Identifying the most intense convergences of data points should

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[91] *See* Briz-Redon, Martinez-Ruiz, and Montes, "Adjusting the Knox Test by Accounting for Spatio-Temporal Crime Risk Heterogeneity to Analyse near-Repeats." For a distinction between traditional hot spot mapping and the near-repeat principle, *see* Hatten and Piza, "Measuring the Temporal Stability of Near-Repeat Crime Patterns: A Longitudinal Analysis." For a discussion on the initial finding on repeat victimization, *see also* Benbouzid, "From Situational Crime Prevention to Predictive Policing."

[92] Brantingham and Brantingham, Paul, "Criminality of Place: Crime Generators and Crime Attractors." *See also* Eck and Weisburd, "Crimes Places in Crime Theory" for an equivalent discussion on crime pattern theory. For the near-repeat effect based on the flag/boost principle, *see* Briz-Redon, Martinez-Ruiz, and Montes, "Adjusting the Knox Test by Accounting for Spatio-Temporal Crime Risk Heterogeneity to Analyse near-Repeats."

[93] Guthrie Ferguson, "Policing Predictive Policing" at 1135.

[94] For additional analytical modeling techniques, see "Geographic Information Systems and Predictive Policing Application Note" (U.S. Dept. of Homeland Security Science and Technology, August 2013). *also*, George, "Predictive Policing: What Is It, How It Works, and Its Legal Implications."

[95] Kennedy, Caplan, and Piza, "Risk Clusters, Hotspots, and Spatial Intelligence: Risk Terrain Modeling as an Algorithm for Police Resource Allocation Strategies."

[96] Kennedy, Caplan, and Piza.

[97] Perry et al., *Predictive Policing*.

[98] "Geographic Information Systems and Predictive Policing Application Note." at 1.

indicate where crimes are most likely to occur. These data sets are informed by the above theories and include quantifiable physical and social factors such as weather, population density, local facilities, socio-economic markers, etc. Using this targeted approach based on a near comprehensive list of environmental factors makes it more likely that a risk can be attributed to a precise location and time for the most effective deterrence or enforcement.[99] The complex analysis required to synthesize such a high number of factors for making a single risk assessment is considered to be best achieved through an algorithmic function often achieved with AI, which will be discussed in a following section.

Once provided with a 'high risk' assessment for a particular location, police agencies may then choose how to allocate their resources to the area. Generally this will take the form of increased patrols (allocating unassigned time to these locations or using the time between calls), increased visible presence, and interacting with the community.[100] The goal is not only to increase presence as a means to deterring criminal opportunities, but to engage members of the community so that they may be more likely to report crime and offer relevant information to patrol police.

Place-based predictions of crime are the most prevalently used in predictive policing and have also had been the subject of much research and scrutiny. As has been briefly outlined, attributes of place are generally accepted as potentially successful indicators of crime and with the advance of sophisticated technologies such as programs equipped with AI, correlations between crimes can theoretically be mapped from a multitude of seemingly remote factors. As

[99] *See* Weisburd, "The Law of Crime Concentration and the Criminology of Place" *also* Perry et al., *Predictive Policing*.
[100] According to the International Association of Chiefs of Police, officers are recommended to devote one third of their shifts to proactive patrol time. *See*, Alese Wooditch, "The Benefits of Patrol Officers Using Unallocated Time for Everyday Crime Prevention," *Journal of Quantitative Criminology*, July 25, 2021.

will be discussed in the sub-section on AI below, these methods are not without their shortfalls and criticisms.

2. Individual-based predictions

As indicated above, individual-based predictions are the less frequently used of predictive analytics by police, however where they have been used, the effects were drastic. Individual-based assessments function quite similarly to that of place-based predictions, by using data to identify potential perpetrators of future crime.[101] As the place-based approach in essence scans an area for facilities that make crime more likely, the individual-based approach looks for a combination of traits in a person that makes it more likely they are at a high risk for committing a crime.[102] These factors often include socio-economic status, demographics, record of previous offenses or arrests, educational history, marital status, home neighborhood, and employment.[103] As discussed in Chapter 1, history of prior offenses is often the most heavily weighted in this assessment. In addition, investigating "negative social networks" may be a way to measure the proximity of the individual to past crimes or known previous offenders.[104] This can be achieved through an adverse social network analysis which detects and interprets "patterns of social ties among actors" for any relevant value.[105] Value may be inferred by the closeness of a relation: family, roommate, or friend. In addition, social media analysis will also analyze characteristics of the individual as outwardly self-portrayed in social relations, or in assessing social norms and

[101] Guthrie, "Beyond Data-Driven Policing" at 378.
[102] Bouchard and Malm, "Social Network Analysis and Its Contribution to Research on Crime and Criminal Justice."
[103] Guthrie, "Beyond Data-Driven Policing." at 357.
[104] Guthrie Ferguson, "Policing Predictive Policing" at 1142. For a discussion on the Chicago Police Department strategy for creating a list of individuals found to be most at risk, and the relevant modeling/linking strategy, *see* Saunders, "Predictions Put into Practice: A Quasi-Experimental Evaluation of Chicago's Predictive Policing Pilot."
[105] van der Hulst, "Introduction to Social Network Analysis (SNA) as an Investigative Tool" at 103.

communications.[106] The use of social media analysis necessarily invokes personal opinions and sentiments of targeted individuals, such as their affiliations, political leanings and others with whom the associate.[107] Though social network analysis may take much more complex forms and is generally reserved for investigating for organized crime, gangs and terror networks, its use is relevant to assessing individuals' levels of risk.[108] As with place-based risk assessments, each of the factors and social associations identified as relevant, are fed into an algorithm that similarly compares the data for trends and relationships of value between the data points.[109]

As predictive analytics only give policing agencies information on the probability of an event occurring, it is left to human decision on how to proceed.[110] Comparing several U.S. applications of individual-based predictions, a typical policing process may be outlined as follows: First, an assessment focuses on "identifiable individuals." Then the technology provides "identification, surveillance, investigation, and intervention" but stops short of creating a stand-alone justification for a stop or arrest.[111] Finally, officers are encouraged to interact with these individuals as a means to deterrence.[112] The first available response to an individual high risk assessment is to increase police presence in the individual's neighborhood, near his home or job, by sending letters, knocking on the door of their home, or otherwise clearly communicating that

[106] Guthrie Ferguson, "Big Data Surveillance: The Convergence of Big Data and Law Enforcement" at 184.
[107] This method of analysis can be used for monitoring political speech or keeping track of public gatherings. For a brief discussion on its use by the London Metropolitan Police, *see* Završnik, "Algorithmic Crime Control" at 139.
[108] van der Hulst, "Introduction to Social Network Analysis (SNA) as an Investigative Tool." *See also* Perry et al., *Predictive Policing* at 96-98.
[109] For an example of individual based predictive policing, the HART program in the U.K. relies on an early risk assessment model.
[110] Tzu-Wei Hung and Chun-Ping Yen, "On the Person-Based Predictive Policing of AI," *Ethics and Information Technology*, June 1, 2020, https://doi-org.proxy.bnl.lu/10.1007/s10676-020-09539-x.
[111] Though predictive assessment cannot provide impetus for an arrest or stop alone, they are encouraged due to the relevance and weight in calculating reasonable suspicion. *See* Andrew Guthrie Ferguson, "Big Data and Predictive Reasonable Suspicion," *University of Pennsylvania Law Review* 163, no. 2 (January 2015): 327–410.
[112] Guthrie Ferguson at 1142-1143.

he is being monitored.[113] Existing examples of individual-based predictive policing indicate a high level of discretion by officers and agencies.[114] Though targeted policing is meant to limit the resources necessary to curb crime, it is still inefficient for an officer to dedicate his patrol to one 'high risk' individual. Officers in Los Angeles have self-reported using "stratified surveillance," in which individuals are flagged for intervention according to the allocated risk score, which is the score ranked against other 'high risk' individuals.[115]

A second method by which targeted deterrence may be directed toward high risk individuals is through a police and community partnership. The thesis will not address this approach any further beyond this section, however as it has proven a valuable alternative to direct police intervention, it will be briefly described here.[116] A community based approach to deterrence is one in which carrots and sticks are used not only to positively incentivize individuals away from opportunities for crime, but to also address the underlying issues apparently correlated with individuals perceived as at higher risk of committing crime. Many of the programs that have proven fruitful are those which offer educational, vocational and mental health support to previous offenders, particularly young men, and former gang members. Often these programs are supplied by community organizations, schools, churches, or mental health providers. Police act as a valuable partner in ensuring individuals are aware of the consequences of not heeding the alternative opportunities, sometimes even with a mandate to press higher level charges if a crime does occur.[117]

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[113] "Aided by Palantir, the LAPD Uses Predictive Policing to Monitor Specific People and Neighborhoods," *The Intercept*, May 11, 2018.
[114] Perry et al., *Predictive Policing* at 90-92.
[115] Brayne, "Big Data Surveillance: The Case of Policing" at 989.
[116] Newburn, "Crime Reduction and Community Safety."
[117] See Amnesty International, "Trapped in the Matrix: Secrecy, Stigma, and Bias in the Met's Gangs Database."

Because individual-based predictive policing, like the place-based method, relies on theories that operate by synthesizing large amounts of data, advanced calculations based in AI are used to make risk assessments. The most efficient way of sorting and grouping sets of data that may appear initially incomparable is best achieved through advanced statistical methods, which with the addition of AI capabilities can react in real-time to previously unknown types of data. The following section will explain how these processes generally work and outline instances where they are proven not to be effective.

E. Artificial intelligence & data

This section will provide a brief overview of AI and outline some of the types of data that are required in order for it to function in the policing context, as well as their sources. Though this will be a very concise outline, it is necessary to understand AI as a discipline in a general sense in order to comprehend and address the legal outcomes of predictive policing.[118] In addition, some critiques of predictive policing will be raised as frequently faulted to the use of AI and myriad data.

1. AI and machine learning

Artificial intelligence is a scientific discipline which encompasses a "collection of concepts, problems, and methods," often characterized as autonomous and adaptive.[119] Its use has many applications which may be manifest in executing either a narrow or general function, or in other words, a set of directions.[120] Predictive analysis is considered a narrow use of AI, that

[118] For an in-depth explanation of AI and machine learning, see Witten and Frank, *Data Mining, Practical Machine Learning Tools and Techniques*.
[119] University of Helsinki and Reaktor, "Elements of AI, How Should We Define AI?," Online course, 2020.
[120] Osoba and Welser IV, *An Intelligence in Our Image* at 4.

is, it is a particular function prescribed in relatively precise terms, and does not require the system to perform unscripted actions. In contrast, a general function would be more akin to a system equipped to behave as a human, reacting to a number of tasks outside pre-set, bounded confines.[121] The analytics utilized in predictive policing dictate that the system is programmed to make a calculation as to the likelihood of an event occurring based on correlations between numerous, seemingly incomparable sets of data. Unlike a hit/no hit system used in other forms of data analysis, which provides certainty of outcome and thereby indicates automated decision making capability, in predictive analysis the system calculates the likelihood that an event will occur, as well as the factors which make it more or less likely.[122] Further unlike a query based data system, AI calculations in this context function on an 'alert' system, that is, if a pattern, relation, or correlation is reached to a set threshold, an alert will be issued, whether or not it was specifically queried.[123] To this end, systems must be able to be constantly running at scale, making observations and outputting results in real time.[124] After all, the relationship between an unknown factor and an event that has not occurred cannot be known in advance, hence the inability to act via query. When adapted to the theories explained above, AI can act as a very powerful tool in providing a likelihood for criminal events.

Sophisticated predictive analytics, and AI, function via algorithmic calculations. An algorithm may be defined as a "finite sequence of precise instructions that are implementable on computing systems" by which data are assessed.[125] In order for the algorithm to attribute relative value to the data it is given, it is necessary that it has been trained on a model which will indicate

[121] University of Helsinki and Reaktor, "Elements of AI, How Should We Define AI?"
[122] For an accessible tutorial on Bayes Theorem*, see* University of Helsinki and Reaktor.
[123] Brayne, "Big Data Surveillance: The Case of Policing" at 990.
[124] Lehr and Ohm, "Playing with the Data: What Legal Scholars Should Learn About Machine Learning" at 701-702.
[125] Osoba and Welser IV, *An Intelligence in Our Image* at 4.

to the system the relative value of points of discrete data. Because the act of crime itself is an impossible piece of data to include in the calculation (its presence would preclude predictive analysis), the relevant data for its prediction are 'proxies' for crime. That is, factors believed to have a strong correlation to crime in the absence of actual future crime data.[126] The model allows the algorithm to apply meaning and value to new, incoming data, based on the inferences drawn between training data which are known to have value as regards crime.[127] To facilitate this, a model must be created which is built to represent the universe in which the subject of analysis resides, according to all known elements and relationships.[128] The model is then trained according to what data are relevant to the model for predicting crime (proxy data) and those are labeled according to category, which allows the technology to essentially sort and compare data points according to their relationships. Following the training of the model on training data, it will be assessed by the use of test data, prior to being used for 'real world' data.[129] Later discussion of bias and discrimination will require an understanding of the model system.

Many AI-reliant technologies are also equipped with the ability to use machine learning, which informs the 'intelligence' aspect of AI. Machine learning essentially entails that an algorithm can assess new data points and infer onto them a label and value, according to their relation to other data.[130] Based on the statistical distribution of patterns between the known and new data, the system can assign, with some degree of certainty, value to the new data and update the model. As all new relevant data become a part of the model, the algorithm subsequently

[126] Cathy O'Neil, *Weapons of Math Destruction* (New York: Crown, 2016).
[127] Pasquinelli, "How a Machine Learns and Fails - a Grammar of Error for Artificial Intelligence" at 5. *See* Pasquinelli *also* for a discussion of supervised learning at 5.
[128] O'Neil, *Weapons of Math Destruction* at 18-20.
[129] Lehr and Ohm, "Playing with the Data: What Legal Scholars Should Learn About Machine Learning" at 684.
[130] Hung and Yen, "On the Person-Based Predictive Policing of AI."

adapts itself to reflect the new model.[131] One common description for this adaptive function is through the analogy to a child's cognitive development. Much like a child who will learn the distinction between cats and dogs based on experience with their relative attributes: ear size, tail length, etc., algorithms similarly use finite attributes to determine the relationship between data points. The child assesses an object to be a dog at ninety percent likelihood, based on the learned value of floppy ears combined with a short tail. However by adding whiskers which are generally associated with a cat, the child may still accurately guess that this is a dog, albeit at a lower level of certainty. Regardless, the child now knows that dogs with floppy ears and short tails may also have whiskers, and moving forward the model reflects that similar whiskers may signal a particular object is a dog and not a cat.[132] So too does analysis by algorithm build on previously known correlations to attribute value to new data, and accordingly adjust the model.[133] AI, therefore does not assess individual data, but the associations and relationships between data.[134] The value of an erroneous assessment though is equally clear, by misidentifying a fact early on will lead to ongoing mis-associations, a form of inductive bias.[135]

2. Implications of data usage

The example of differentiating a dog and cat is rather simplistic, however exemplifies quite clearly the ability for a program to assign previously unknown data points associative

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[131] Jessica Gabel Cino, "Deploying the Secret Police: The Use of Algorithms in the Criminal Justice System," *Georgia State University Law Review* 34, no. 4 (2018): 1073–1102. *See also* Osoba and Welser IV, *An Intelligence in Our Image* at 5.
[132] For a discussion on neural network analysis, the means by which this example functions, *see* Sumit Saha, "A Comprehensive Guide to Convolutional Neural Networks - the ELI5 Way," Website, *Towardsdatascience.Com*, December 15, 2018.
[133] Osoba and Welser IV, *An Intelligence in Our Image* at 5.
[134] Krystian Woznicki, The politics of artificial intelligence: an interview with Louise Amoore, written, October 26, 2018, https://www.opendemocracy.net/en/digitaliberties/politics-of-artificial-intelligence-interview-with-l/.
[135] Mireille Hildebrandt, "The Issue of Bias: The Framing Powers of ML," in *Machines We Trust, Perspectives on Dependable AI* (MIT Press, 2021).

value. This automated, or semi-automated, process of discovering patterns and their relative distributions,[136] based on the sorting and assessing of stored data is termed data mining.[137] Data mining functions by searching and sorting electronically stored data to generate new information. Using large amounts of data provides a system using RTM or GIS programming a higher number of factors to which some relationship may be attributed and thereby increases the potential for meaningful predictions. Indeed, with small amounts of data machine learning algorithms likely provide little practical information.[138] Though it is possible to have too much data, the machine learning function is also generally adept at discarding 'noisy data.'[139] Though biases will be discussed at length at later points, the matter of bias in labeling is important to also mention here. Much of the discussion on biases focuses on human error and subjectivity. However there are biases which may not be included as a result of human input, but rather a confluence of factors that an AI system may recognize autonomously due to the ability to make complicated inferences. As humans code the original metric for value in data via the assignment of proxies, indirect subjectivity may be pieced together in a machine learning inference over a series of calculations.[140] It is also an important aspect of relying on data to define behavior, that even in the absence of human biases, the translation of human language and social norms into numerical computations imbues certain values on measurable characteristics, flattening multi-dimensional human characteristics into the aspects which may be quantified.[141]

As a final note on AI, due process and various rights implicated by predictive policing as it is currently constructed are frequently affected by the 'black box' condition of machine

[136] Pasquinelli, "How a Machine Learns and Fails - a Grammar of Error for Artificial Intelligence" at 4.
[137] Witten and Frank at 5.
[138] Lehr and Ohm, "Playing with the Data: What Legal Scholars Should Learn About Machine Learning" at 678.
[139] *Infra* note 56.
[140] Mikhail Reider-Gordon et al., "Artificial Intelligence, Predictive Analytics, and Unlawful Discrimination."
[141] Mireille Hildebrandt, 'Law as Computation in the Era of Artificial Legal Intelligence, Speaking Law to the Power of Statistics' (2018) 68 University of Toronto Law Journal 12, 4-9.

learning, whereby calculations executed by the program are invisible to the end-user.[142] 'Black box' is a general reference to any institution or process which is opaque in its inner-functioning. Due to machine learning as described above, one may easily assess the input and the output (here, data) of an algorithm, however what causes the transition from in-form to out-form is invisible to any degree of specificity.[143] Though an algorithm can function on little data, as in the example of simplistic crime mapping, the precision and therefore value of the output is minimal. Therefore higher numbers of data allow for more accurate and robust predictive analysis, which in turn benefit from the adaptive capabilities of machine learning, theoretically increasing the opacity of the black box.[144]

In the Chapter 6, the thesis will address the tensions between fundamental rights, due process, and the use of AI for predictive policing. One of the solutions frequently proposed to the apparent infringement on fundamental rights is to increase the transparency of AI programs and the algorithms through which police may 'predict' likely crimes. Aside from issues of accurate data or the non-transparency of policing actors themselves, theories of explainable AI addresses the issue of the AI program itself through a category of AI that is designed to avoid the black box. It follows that these programs are able to "…explain[ ] the rationale for the decision-making process, surface[ ] the strengths and weaknesses of the process, and provide[ ] a sense of how the

[142] In addition to the growing 'knowledge' of the algorithmic system, the black box is also attributed to deleted information. In the analysis and compression phase, data which is apparently useless to the program will be irreversibly erased. *See* Pasquinelli, "How a Machine Learns and Fails - a Grammar of Error for Artificial Intelligence" at 12-13.
[143] One way to understand the relationship between input and output data is as 'functional.' See Lehr and Ohm, "Playing with the Data: What Legal Scholars Should Learn About Machine Learning" at 709-710.
[144] For a discussion on data training pitfalls, namely overfitting or under-fitting the training model, as well as 'noise', see Pasquinelli, "How a Machine Learns and Fails - a Grammar of Error for Artificial Intelligence" at 11. For a discussion on supervised and unsupervised learning *see* Witten and Frank, *Data Mining, Practical Machine Learning Tools and Techniques* at 42-43.

system will behave in the future."[145] Explainable AI may be categorized according to the system which is being utilized: opaque, interpretable, comprehensible, or truly explainable system.[146] Differing systems may be explainable in different ways, such as by allowing the inputs to be explainable but not the innerworkings, or conversely by leaving the front-end of the process inaccessible but allowing a means to explaining the output. Forms of explainability may therefore be classified as exogenous or decompositional. Ideally an explainable AI to be used for criminal justice processes should be both interpretable and comprehensible[147] but will vary according to the relevant stakeholder; this may be a police officer or manager, citizenry, or developers. AI used for policing should also strive to be explainable not only in how data were used, but why particular types of data categories were used. This supersedes the explainability of the program itself and requires an additional level of transparency at the level of cooperation between the developer and contracting police agency.[148]

Depending on the stakeholder it will be determined the correct manner of explainability, how it is best achieved, and what legal issues may arise, such as data protection or trademark.[149] This 'glass box' approach would purport to answer calls for 'trustworthy' AI and allow for deeper human intervention and auditing of the system. By allowing both the user and developer to view and understand the manner in which the program operates and produces predictions, it should be possible to determine whether attributes such as race, even if by proxy, are directly or

[145] Arun Rai, "Explainable AI: From Black Box to Glass Box," *Journal of the Academy of Marketing Science* 48 (2020): 137–41, 138.
[146] Stuart W. Hall, Amin Sakzad, and Kim-Kwang Raymond Choo, "Explainable Artificial Intelligence for Digital Forensics," *Wiley Interdisciplinary Reviews: Forensic Science* 4, no. 2 (2022).
[147] Ambreen Hanif, Xuyun Zhang, and Steven Wood, "A Survey on Explainable Artificial Intelligence Techniques and Challenges," 2021.
[148] Friso Selten, "Can Explainable AI Mitigate Decision-Making Errors Induced by Algorithms in Street-Level Police Work? An Experiment" (Utrecht University, 2021), 9.
[149] Rita Matulionyte and Ambreen Hanif, "A Call for More Explainable AI in Law Enforcement" (IEEE 25th International Enterprise Distributed Object Computing Workshop, Macquarie University, 2021).

indirectly used in order to reach outcomes. The increased 'trust in the model' should similarly allow for increased 'trust in the prediction.' However it must also be considered in developing explainable AI for law enforcement purposes that not all types of machine learning may be effectively explainable. In these systems, such as an emergency response system that utilizes complex machine learning methods like neural networks to provide accurate and rapid results, it may be preferable to sacrifice explainability for effectiveness. Though not argued herein that predictive policing justifies the same level of 'blind' trust, these are questions that must be answered in implementing explainable AI.[150]

This sub-section will conclude with several short points on data. It is important from a legal perspective, privacy perspective, and practically, to understand some of the types and origins of data used. Data comes in a variety of incomparable forms too numerous for the human mind to reasonably sort and assess.[151] As described above, the ability for an algorithm to adapt and form new connections indicates that large amounts of data, even which may seem insignificant or extraneous to the average person, may be important for predictive analytics.[152] As will be discussed in the context of legal analysis, this also has implications for collateral parties, those not the primary subject of analysis. In both variations of predictive policing, historical crime data plays a central role. Former crimes are important not just for assessing location or offender, but when paired with other data illustrate the patterns and trends that are

[150] Patrick Grady, "The EU Should Clarify the Distinction Between Explainable and Interpretability in the AI Act," Center for Data Innovation, August 31, 2022, https://datainnovation.org/2022/08/the-eu-should-clarify-the-distinction-between-explainability-and-interpretability-in-the-ai-act/#:~:text=A%20revised%20AIA%20should%20define,obliging%20any%20particular%20explanation%20method.

[151] For a discussion on Bayes Theorem *see supra* note 43.

[152] For an in-depth explanation of how datasets feed into predictive analytics using real use case examples, see Tahani Almanie, Rsha Mirza, and Elizabeth Lor, "Crime Prediction Based on Crime Types and Using Spatial and Temporal Criminal Hotspots," *International Journal of Data Mining & Knowledge Management Process* 5, no. 4 (July 2015).

necessary for assessing the factors that make future crimes likely. At the most basic and benign level, place-based factors may include weather, time of day, and season in which the crime occurred, most of which is public information.[153]

In the context of individually-based predictions, the types of data utilized are necessarily and significantly more personal. Data sets may include phone numbers, details of social associates, financial records, addresses, and family history among many others.[154] Though the level of protection afforded to these personal types of data differ by jurisdiction, as discussed in Chapter 5, the use of predictive policing to make individual risk assessments will likely require the use of at least some of these data. Therefore a legal framework for predictive policing must acknowledge and account for this reality. Similarly, individuals who are not the focus of police but associated with an individual deemed 'high risk' may be the subject of "secondary surveillance," in which their information is collaterally collected.[155] A common data protection solution used in many jurisdictions is to anonymize data so that individuals, both targeted and secondary, are not easily identified in the absence of an adverse finding. Unfortunately, the ability of machine learning algorithms to adapt to new data has been found to reverse anonymization attempts and reconstruct sensitive data fields.[156]

A more relevant aspect of data for the purpose of this thesis is the effect of 'bad data.' Bad data can take many forms, such as data which is incomplete, inaccurate, duplicated, outdated or fragmented.[157] The disservices of inputting bad data into an algorithm are two-fold. The first adverse result of using bad data is the myriad data protection implications it has for individuals.

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[153] *Infra* note 88.
[154] Guthrie Ferguson, "Policing Predictive Policing" at 1138.
[155] Brayne, "Big Data Surveillance: The Case of Policing" at 992.
[156] Osoba and Welser IV, *An Intelligence in Our Image*.
[157] Guthrie Ferguson, "Policing Predictive Policing" at 1145.

The second problem with using bad data is the likelihood they will lead to inaccurate results and may perpetuate biases. Bad data can derive of human error or actual malicious purposes such as bad intent or hacking.[158] However the more mundane forms of human error as simple as an incorrectly transcribed birth date or address can be inadvertently cloaked in layers of analysis and police paperwork. Further training an algorithm on incorrect data can create a risk categorization that previously did not exist nor accurately reflects reality. A model corrupted in this way may also cause an increase in false positives or false negatives which have important implications on individuals' rights in the wake of a resulting police intervention. In both place- and individual-based predictive policing methods, bad data clearly has a high potential to create inaccurate associations between places, individuals, and crime.

The infusion of AI-reliant programs into predictive analytics is clearly a very powerful tool in making risk assessments for the purposes of preventing crime. However like the average individual, most uniformed officers do not understand the intricacies of these technologies. It is therefore difficult to assess the effectiveness of predictive policing practices or even attribute the cause of errors. Though due to the importance of balancing policing goals and the risk of causing undue harm to civilians, it is necessary to evaluate the efficacy of such technology.

F. Conclusion

This chapter has aimed to provide an overview of predictive policing and crime prevention, as well as the mechanics of risk assessments and AI. As the following chapters will address and discuss some of the most pressing and critical effects of predictive policing on

[158] Hung and Yen, "On the Person-Based Predictive Policing of AI."

individuals' right to due process, this chapter should have clarified the processes to which the discussions will refer.

Chapter 3: Overlapping Frameworks: the Presumption of Innocence as a Due Process and Fair Trial Right

A. Introduction

This chapter analyzes the effect of predictive policing on the presumption of innocence. As argued thus far in the foregoing chapters, the use of sophisticated technologies for policing in particular risk assessments, is misaligned to the existing structures which frame the criminal trial process in many countries. The previous chapter identified the ways in which predictive policing may perpetuate biases that proliferate through the policing process, up through investigation, and criminal trial. At each of these points individuals' fundamental rights may be infringed by the very initial act of policing by risk assessment. In the same way the presumption of innocence is a tenet of due process, intricately tied to criminal proceedings. This chapter assesses the manner in which courts look to policing as affecting the later fairness of a criminal trial to gauge how they may similarly rule in cases of predictive policing. It will advance the resulting argument in the following manner. The chapter first demonstrates the normative nature of the presumption as one which defines the relationship of the state and individual in terms of legal certainty and mutual obligations. It posits that despite the context-specific implementation of the presumption in differing legal contexts, at its core the presumption of innocence is a crucial requirement of fairness.

After establishing the normative value of the presumption, the chapter conducts an assessment of several legal systems, through which it illustrates that despite varying implementations of the presumption, predictive policing is no longer well-aligned to existing

frameworks. The first jurisdiction to be assessed is the Council of Europe (CoE) in which the case law very clearly delineates the role of the presumption to be contained largely in the criminal trial process, but also extending into pretrial and post-trial procedures. Next, the chapter briefly assesses some of the attributes of the United Kingdom and criminal procedure, as the presumption is more embedded within due process. Though a CoE country, its political and cultural placement between Europe and the United States is informative of its approach to policing and fair trial processes. The treatment of the presumption in France is next outlined to demonstrate a jurisdiction in which the presumption is very clearly declared by the legislature to be relevant to policing and held to constitutional standards. Finally, the chapter briefly assesses the role of the presumption of innocence in the United States. It will demonstrate that in that context the presumption is very clearly confined to the courtroom where it receives much less consideration than in other jurisdictions. However as will be expounded upon in the analysis, it is proposed that the essence of the presumption may likely be further developed in American jurisprudence with an expanding reliance on digital evidence.

The chapter will in summation seek to argue that the presumption of innocence plays a very important role in the act of policing and an even more pronounced role in the act of predictive policing. The jurisdictional differences illustrated seek to be instrumental in demonstrating that in some jurisdictions this recognition is already codified, whereas in others it is protected in essence though less so formally; but it is relevant to predictive policing in all.

B. Defining the presumption of innocence

The presumption of innocence (presumption) is a complex and well debated concept that informs criminal procedure worldwide yet lacks an agreed upon definition, and is implemented

in as many ways as it is interpreted. The presumption lacks a unified approach to definition for a number of reasons. First, a presumption is a belief that regards an unobserved fact, based on probability, and accepted as a given conclusion.[1] There are multiple examples of presumptions throughout daily life, such as to experience rain generally leads to the presumption that there are clouds in the sky, whether or not observed. Similarly, in the legal context a set of facts leads to a conclusion on some status of law, regardless of whether the legal status matches a factual conclusion. Unlike a presumption as to the weather, a legal presumption though based on a particular set of facts, is socially constructed. Therefore legal and factual conclusions are not necessarily correspondent nor apparent.[2] For instance, a particularly precocious child below a certain age is not legally capable of consent to certain activities despite an actual mental and physical ability to do so. Inversely, an adult is presumed capable of providing legal consent to most activities, despite the fact that it is not necessarily true of all adults. To rebut or overcome a presumption occurs if sufficient evidence is provided to render the presumption inapplicable.[3] In the case of consent, the presumption that sufficient age allows an inference of consent may be overcome if the individual though at the age of majority is mentally incapacitated, for instance. This is also true with the presumption of innocence, in which the facts do not inform the presumption but rather the presumption informs legal status and precedes the facts, unless/until rebutted or overcome.[4] In the case of a criminal trial, facts may support an inference of guilt, however the legally derived presumption requires the treatment of innocence until overcome.

[1] Carl-Friedrich Stuckenberg, 'Who Is Presumed Innocent of What by Whom?' [2014] 8 Criminal Law and Philosophy 301, 305.
[2] Pamela Ferguson, 'The Presumption of Innocence and Its Role in The Criminal Process' (2016) 27 Criminal Law Forum 131, 135.
[3] Harold Ashford and Risinger D. Michael, 'Presumptions, Assumptions, and Due Process in Criminal Cases: A Theoretical Overview' (1969) 79 The Yale Law Journal 165, 165.
[4] Thomas Weigend, 'Assuming That the Defendant Is Not Guilty: The Presumption of Innocence in the German System of Criminal Justice' (2014) 8 Criminal Law and Philosophy 285, 286.

Should facts supporting an inference of guilt be sufficiently proven, then the presumption is rebutted.

The presumption has well-documented, deep roots in Western systems of government, acting as a core principle guiding the relationship between the state and the citizen. It is a liberal stance that defines criminal justice as the balance between providing appropriate punishment for public security with respect for the autonomy and dignity of the individual.[5] In practical terms, it also sets the standard of proof in the criminal trial and as a "shield against punishment before conviction"[6] in both the criminal and civil context.[7] The presumption underlies modern penal law in some iteration since the *Code of Hammurabi*, finding its place in Roman law, and through the Middle Ages. Throughout its genesis and evolution through time it has proscribed harsh treatment for those yet convicted, disallowed punishment on an allegation alone, and ensured precepts of due process such that position, title, or property could not be prematurely seized from the accused.[8] It contracted and re-animated in the course of the French Revolution and similarly established itself in the foundation of English law. Perhaps most notably in the modern canon it embodies Article 9 of the *Déclaration des droits de l'homme et du citoyen*, stating that "Every man being presumed innocent until he has been pronounced guilty, if it is thought indispensable to arrest him, all means that may go beyond what is strictly necessary to secure his person ought to be strictly suppressed by law."[9] Codified verbatim into the French Constitution, it also enjoys prominent placement in most constitutions and criminal codes.

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[5] Andrew Ashworth and Lucia Zedner, 'Defending the Criminal Law: Reflections on the Changing Character of Crime, Procedure, and Sanctions' (2008) 2 Criminal Law and Philosophy 21, 22.
[6] Francois Quintard-Morenas, 'The Presumption of Innocence in the French and Anglo-American Legal Traditions' (2010) 58 The American Journal of Comparative Law 107, 108.
[7] J. Harvie Wilkinson, "The Presumption of Civil Innocence," *Virginia Law Review* 104, no. 4 (June 2018): 589.
[8] Quintard-Morenas (n 6), 110-120.
[9] *Déclaration des droits de l'homme et du citoyen du 26 août 1789*, (26 August 1789), https://www.refworld.org/docid/3ae6b52410.html (last accessed 26 January 2022).

Accepting that at its core the presumption protects citizens against arbitrary punishment by the state, it may be considered as a formative aspect of the state-citizen relationship. This relationship like any other, consists of mutually reinforcing responsibilities, rights, and expectations. It has been suggested of the presumption that it very specifically informs a level of trust and respect between the parties providing assurances that define and foster effective legal certainty. In the case of criminal law, the presumption ensures that the state allows accused citizens the right to a fair defense, accepting that charges and evidence may be wrongly classified or factually untrue, and the defendant accordingly has the right to make that case. In turn, trust and respect of the citizen is earned, or re-earned, by fulfilling civic prescriptions for instance in the form of abiding law, or fulfilling retributive or restorative measures.[10] The healthy maintenance of this relationship should accordingly guard against the pre-emptive labeling of individuals as suspects, as a matter of diligence against wrongful punishment. Where a conflict arises, for instance the commission of a crime, this guidance acts to set the rules of the mediation between the state and accused individual.[11]

Having explored the function of a presumption, this sub-section next outlines the scope of innocence. Innocence generally indicates a lack of culpability. However as is regularly noted in the literature, innocence in the legal setting must be qualified as regards a specific act, as no one may be perfectly innocent of everything at all times. Even when qualified, innocent is a loaded term in the legal setting because one may not be fully innocent or perhaps culpable but not guilty in both factual and legal terms.[12] If innocence is the inverse of guilt, it must be determined what is construed as guilt and whether guilt is synonymous to culpable. The determination of intent,

[10] Magnus Ulvang, 'Presumption of Innocence versus a Principle of Fairness: A Response to Duff' (2013) 42 Netherlands Journal of Legal Philosophy 205, 209-2012.
[11] Hamish Stewart, 'The Right to Be Presumed Innocent' (2014) 8 Criminal Law and Philosophy 407, 408.
[12] David Brink, "The Nature and Significance of Culpability," *Criminal Law and Philosophy* 13 (2019): 347–73.

the foreseeability of consequences and damage incurred may imply a lack of culpability even when the individual clearly committed the act. Or in other words, is factually guilty. In these cases it is also possible that culpability is shared with an accomplice(s) or only partially attributable to each individual.[13] Similarly, a criminal act may be fully attributable to an individual, but due to the presence of an adequate defense he/she may not be legally culpable. Legal innocence may be construed in a variety of manners in relation to a specific allegation and its designation *vis-a-vis* the presumption is generally considered to mean innocent as to the accusation in question.[14]

Based on definition alone, the presumption evades clear, specificity outside of context. Regardless, it plays a key role at trial and in criminal procedure, which despite varying treatment across jurisdictions, retains an important place in rights of the defense in most systems.[15] Therefore it is here simply proposed that the normative underlying value to the presumption cannot be discarded, even if procedural qualifications define its use differently according to context and procedure. The chapter describes differing implementations of the presumption, seeking common practices as already established in law and which may also apply to predictive policing.

1. Putting the presumption into context

As established, in the practical sense the presumption prescribes the state to treat an individual as though he/she is factually innocent of a particular offense, despite simultaneously

[13] ibid, 216.
[14] For an expanded approach to the presumption of innocence as it relates to substantive criminal law and potentially inchoate or preparatory offenses, *see* Victor Tadros, "Rethinking the Presumption of Innocence," *Criminal Law Adn Philosophy* 1 (2007): 193–213.
[15] Ulvang, "Presumption of Innocence versus a Principle of Fairness: A Response to Duff."

adhering to the burden that it produce sufficiently convincing evidence to support an allegation to the contrary.[16] In the courtroom, it is a legal principle set in juxtaposition to the prosecution's *prima facie* assertion that a charged individual has engaged in an act which meets the statutory elements of a crime.[17] Therefore the presumption acts as a procedural instruction to the court based in legal, if not actual fiction.[18] Whether the defendant is legally or factually innocent is not relevant to applying the presumption; it is only relevant that the determination of guilt or innocence be made fairly and without prejudice. The presumption sets the basis from which the trial will proceed as regards the relative positions of the parties.[19] It requires a formal stance that an individual is innocent so to avoid insinuating or causing prejudgment, which may lead to undue deprivation of liberty. It is not an assertion that he/she is innocent, but rather ensures that the rule of law is maintained in the criminal process.[20] Therefore the concept underlying the presumption is in practice, often counterfactual and does not distinguish between culpability, guilt, and excuse. However with the increasing use of automated crime prevention, the formerly contrasted scopes of innocence and guilt are practically blurred.[21]

This blurring may be demonstrated through a corollary to the presumption of innocence, the presumption of harmlessness. The notion of harmlessness, or in its inverse, dangerousness, is

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[16] Thomas Weigend, 'Assuming That the Defendant Is Not Guilty: The Presumption of Innocence in the German System of Criminal Justice' (2014) 8 Criminal Law and Philosophy 285 https://doi.org/10.1007/s11572-013-9271-4, 286-287 accessed 10 May 2021.

[17] "The presumption of innocence does not have any cognitive pretensions but prescribes the hypothetical starting point of due process." Van Sliedregt, 'A Contemporary Reflection on the Presumption of Innocence [2009] 80 RIDP 1, 264; Antonella Galetta, 'The Changing Nature of the Presumption of Innocence in Today's Surveillance Societies: Rewrite Human Rights or Regulate the Use of Surveillance Technologies?' [2013] 4 European Journal of Law and Technology.

[18] Carl-Friedrich Stuckenberg, 'Who Is Presumed Innocent of What by Whom?' [2014] 8 Criminal Law and Philosophy 301, 305.

[19] Sherman Clark, 'The Juror, the Citizen, and the Human Being: The Presumption of Innocence and the Burden of Judgment' [2014] 8 Crim Law and Philos 421, 424.

[20] Hamish Stewart, 'The Right to be Presumed Innocent' [2014] 8 Crim Law and Philos 407, 407.

[21] Ferry de Jong and Leonie van Lent, 'The Presumption of Innocence as a Counterfactual Principle' [2016] 12 Utrecht Law Review 32.

important to the below discussion of a so-called presumption of guilt as initiated by the police. The practice of predictive policing rests wholly on the theory that certain individuals pose a risk to society, generally in the form of a crime they are deemed likely to commit, based on past behavior or the cumulative weight of individual characteristics.[22] By categorizing individuals as 'risky' we may also say that we consider them to be 'dangerous' or, not harmless. However like 'innocent,' the term dangerous when applied to a person is quite ambiguous. Often criminal law prohibits dangerous or reckless acts, but stops short of prohibiting an individual from *being* an inherently dangerous person. Just as 'innocent' is ambiguous outside context, 'danger' as a label is problematic when applied to an individual. However it is increasingly used in the context of crime prevention. Limits on defining harm, risk, and danger are well illustrated by the arguments made around the use of pretrial detention. Debate as to whether the presumption applies to pretrial detention, and to what degree it is influential is often couched in terms of harmfulness. Pretrial detention is generally considered a necessary derogation of the presumption, as it may be justified in particular circumstances in which the interest of community safety outweighs the possible costs to the individual detained.[23] In the Netherlands, for instance, a judge has the discretion to determine the necessity of pretrial detention based on factors including the seriousness of the crime and whether the individual is *dangerous* to society.[24] If the judge determines that there is a "grave suspicion" of danger, he/she may deem the individual unfit for release.[25] Though the system is generally intended to be balanced toward the presumption, it is

[22] Andrew Ashworth and Lucia Zedner, 'Risk Assessment and the Preventive Role of the Criminal Court', *Preventive Justice* (Oxford University Press 2014), 131.
[23] Lonneke Stevens, "Pre-Trial Detention: The Presumption of Innocence and Article 5 of the European Convention on Human Rights Cannot and Does Not Limit Its Increasing Use," *European Journal of Crime, Criminal Law and Criminal Justice* 17 (2009): 165–80.
[24] Other factors include whether the crime was isolated, as well as the nature of the crime and criminal history of the defendant.
[25] Lonneke Stevens, 'The Meaning of the Presumption of Innocence for Pretrial Detention: An Empirical Approach' (2013) 42 Netherlands Journal of Legal Philosophy 239, 242.

impossible to ignore the fact that it is not only the alleged act of the defendant, but the infinite range of possible acts resulting from their inherent dangerousness. Like a generic label of innocence, the propensities of an individual as perceived, become actionable due to a calculated risk of danger.[26] Therefore in the case of assessing risk of future harms, the feared behavior need not be defined, rather the focus shifts to harmfulness of the individual.

Equating innocence with harmlessness illustrates a stark misalignment in the application of criminal standards. The use of risk assessments leads to an the application of *harmful*, or *dangerous* to individuals' potential criminal capabilities during pretrial processes. However upon becoming a suspect and subject of subsequent investigation, an individual must be treated as legally innocent of an act that is ill-defined. On other words, *dangerous* does not align to the inverse of innocent in the legal context. As established, innocence is relative to a particular object, or allegation. Just as the prosecution must prove the elements of a charge at trial, police may initiate an investigation based on observations that allow the presumption of acts which constitute elements of a criminal act. It is therefore argued that an approach to policing that prioritizes crime prevention based on individual propensities, so determined, does not meet the standards necessary to ensuring the presumption.

2. Policing and the 'presumption of guilt'

Already discussed in preceding chapters, police are responsible for a wide and varied range of official duties. Relative to crime control, they are bound to spotting, identifying, and thwarting criminal acts. They must therefore act with the belief that someone will at some point commit a crime and that suspicious behavior may indicate that person and criminal act. As

[26] RA Duff, 'Presuming Innocence' (University of Minnesota Law School 2012) Legal Studies Research Paper Series 12–32, 21.

described in the previous sub-section, a person is not inherently guilty, just as they cannot be inherently innocent. The presumption of guilt herein refers to the value attached to suspicion by police which is discussed at length in Chapter 4. In policing "certainty" is generally defined by a reasonable suspicion, meaning that in the absence of quantifiable certainty action is not justified. The bounds of acceptable action are further defined in accordance with applicable law and policing regulations, but always in balance with individual rights. Therefore the duty to act simultaneously constrains the acceptable range of actions in order to avoid an arbitrary or misapplication of law.[27] Therefore police like other actors in criminal justice systems, act according to a legal standard that is devised according to the impact policing may have on individuals' rights. While a prosecutor may maintain the power to ensure the incarceration of an individual, a police officer may be at liberty to stop an individual if he/she reaches the lower standard of probable cause, or reasonable suspicion, whereas the prosecutor must overcome the much higher reasonable doubt standard.[28] Thresholds of suspicion act to guard against the same due process and personal rights infringements as does the presumption in the trial, the operative difference being the object of its counterweight. Whereas a police officer may not intrude upon your home without a warrant, a judge may not deprive an individual of liberty without a satisfactory finding of the elements of a criminal act to proof beyond a reasonable doubt. This is an intentional and important distinction, but illustrates that these standards are not truncated and borne of discrete purposes. Instead it demonstrates that the presumption that an individual may be innocent protects him/her against the deprivation of liberty just as it protects him/her against unreasonable searches and seizures by police. The burden is different only in that it is set to

[27] Supra 33.
[28] Doaa Abu Elyounes, 'Bail or Jail? Judicial versus Algorithmic Decision-Making in the Pretrial System' (2020) 21 Columbia Science and Technology Law Review 376, 63.

match the level of potential wrongful intrusion to the individual.[29] Accordingly, in jurisdictions where a judicial warrant is necessary for police to conduct a search, the limits of the allowance are set to be as narrowly tailored and specific as possible. This ensures the fairness of the fact-finding process which begins with the police and follows through the trial.[30] This view of the relative burdens in the criminal process demonstrates the role of the presumption in policing.

As discussed, harmfulness as a metric for crime prevention is also problematic when equated in practice with an inference of guilt. 'Dangerous' individuals, so-called, may become subjects of police scrutiny. Insofar as a risk assessment evaluates an individual based on his/her distinct traits, the category of risk is defined as a group profile. Therefore an individual may be deemed dangerous in relation to the group but there is no individualized manner of suspicion based on the acts of a crime.[31] It has been suggested that the shift toward prevention prioritizes process over prosecution. In other words, suspicion is generated by relative risk and only from this point does investigation for a potential harm proceed to later discover harm.[32] In the way innocence lacks definition and context, the notion of harmful drives a presumption of a guilty individual, rather than toward a specific offense. However at the point of trial innocence must be tied to an allegation, which previously missing in the policing action propels a trial that rests on faulty foundations.

Stepping back from the normative aspects of the presumption in policing, there are additional considerations as to the more tangible ways in which perceptions of guilt may be induced. In many jurisdictions, the notion of innocence cannot lawfully be called into question

[29] Wilkinson (n 7), 607-609.
[30] Ferguson, "The Presumption of Innocence and Its Role in The Criminal Process."
[31] Linnet Taylor, "On the Presumption of Innocence in Data-Driven Government, Are We Asking the Right Question?," in *Being Profiled* (Amsterdam University Press, 2018).
[32] David Carson, 'Models of Investigation', *Handbook of Criminal Investigation* (Routledge 2007), 411-412.

by illegitimate acts of state authorities, lest this prejudices the trial. The obvious power of the police to project a showing of innocence or guilt with whatever effects it may have on forward processes of investigation, make clear the degree to which the presumption is affected by policing. It may be logically inferred that public acts by police have the potential to sway public opinion or that of other state actors, as police are similarly state authorities acting within an official capacity.[33] Individual who witness another being arrested, handcuffed, or put into custody, are more inclined to form a belief in guilt just as the use of courtroom restraints and excessively securitized transfers from the detention facility to the court promote a sense of danger.[34] Though the use of arrest or constraints may at times be necessary, this thesis suggests that the inconclusively of predictive policing may make such actions beyond reasonably necessary. The power of policing on public perception is shown by the fact that police in some jurisdictions use their position to an advantage in order to publicize high profile arrests or potentially influence public opinion against a prolific suspect.[35] Though it generally occurs in jurisdictions where it is permissible, it ironically demonstrates the rationale for its prohibition elsewhere.

Police are expected to act according to an objectively observed set of facts in making the assumption that an individual is guilty of an offense. These observations are "descriptive and factual" and inform the presumption of guilt of a criminal act.[36] This informed belief should guide the collection of evidence and subsequent investigation. It is an important caveat to note

[33] William Schabas, *The European Convention on Human Rights: A Commentary* (Oxford University Press 2015), 302-303.
[34] Tom Tyler, 'Police Discretion in the 21st Century Surveillance State' (2016) 14, 610.
[35] Fair Trials, 'Innocent until Proven Guilty? The Presentation of Suspects in Criminal Proceedings' (Fair Trials 2020), 52.
[36] Kevin Cyr, 'The Police Officer's Plight: The Intersection of Policing and the Law' (2015) 52 Alberta Law Review 889 *citing* Herbert Packer, 'Two Models of the Criminal Process' (1964) 113 University of Pennsylvania Law Review, 12.

the discretionary aspect of treating evidence objectively may in many cases allow unconscious biases to seep into a criminal investigation. This is well displayed in particular types of crime, such as child deaths, alleged suicides, or apparent acts of arson, for which there is a readily apparent, if not obvious explanation available according which police may guide their investigation. In so doing they may unconsciously discard other theories of a case or subconsciously only note evidence which helps to confirm their suspicion.[37] The use of a risk assessment to guide a belief in guilt, may similarly shape the theory of an investigation or patrol. Though this chapter deals with substantive, legally challengeable types of infringements to the presumption, this point is intended to illustrate that there are numerous other ways in which a presumption of guilt may trickle into the criminal process.[38] Based on the foregoing, it is clear that policing cannot be seen as occurring in a vacuum apart from the criminal trial process. The following sections will explore the state of case law on policing and the presumption to support a supposition on how it may apply to predictive policing.

C. Applications and contexts

The application of the presumption is generally defined by the jurisdiction in question, resulting in a dichotomy of categorizations such as 'broad/narrow' or 'think/thin.'[39] A narrow definition of the presumption usually dictates that it is defined by its practical role in the trial and it is not applicable in pre-/post-trial processes. The broad, or thick categorization is one in which the definition tracks more closely to its normative roots. Though it also encompasses a practical

[37] Michael Naughton, 'How the Presumption of Innocence Renders the Innocent Vulnerable to Wrongful Convictions' (2011) 2 Irish Journal of Legal Studies 40; *see also*, Jessica Henry, *Smoke but No Fire, Convicting the Innocent of Crimes That Never Happened* (University of California Press 2020).
[38] Marianne FH Hirsch Ballin, *Anticipative Criminal Investigation: Theory and Counterterrorism Practice in the Netherlands and the United States* (TMC Asser Press 2012), 547.
[39] Jackson Allen, 'Rethinking the Relationship between Reverse Burdens and the Presumption of Innocence' (2021) 25 The International Journal of Evidence & Proof 115, 116.

trial purpose, it generally extends into other aspects of the process of a criminal case following an effects-based approach. The distinction in implementation also falls generally along lines of procedure. Typically common law jurisdictions which exercise the trial via an adversarial system apply a stricter interpretation, while civil law countries with inquisitorial trial systems apply a broader contextualization.

1. Wide interpretation: Case of the European Convention of Human Rights

CoE jurisdictions are subject to the European Convention on Human Rights (ECHR) and accordingly apply the presumption according to its role within the suite of fair trial rights guaranteed in Article 6. Article 6.2 stipulates that 'Everyone charged with a criminal offence shall be presumed innocent until proved guilty according to law.'[40] According to the Article, the presumption does not *de facto* manifest until the issuance of a charge nor does it *de facto* apply following the trial, giving the impression of a narrow interpretation.[41] However this doctrinal baseline from which the presumption is guaranteed is expanded upon by the case law of the ECtHR, which broadens the scope of its application.

i. ECtHR case law/guidance

Case law on policing acts in which the presumption applies prior to the opening of an investigation are limited to very specific scenarios. However the Court has offered some indication on how it may adjudge related questions of law in issues raised by predictive policing. Series of holdings suggest that the Court interprets the presumption in the manner least likely to

[40] European Convention for the Protection of Human Rights and Fundamental Freedoms as amended by Protocols Nos. 11 and 14 [1950] ETS 5 art 6.2.
[41] Van Sliedregt [15] 260.

eviscerate its value, taking a holistic, fact based approach that preserves the essence of fairness as a consistent feature of the criminal process. Firstly, the Court has confirmed that in certain situations the presumption may be applicable prior to formal pretrial processes as well as beyond the trial. This includes both police driven pretrial procedures, such as pretrial detention, as well as actions taken following an acquittal. Secondly, it has addressed the categories of individuals who may be considered public authorities with the power to influence public opinion as regards the defendant's innocence, as well as the content and form of such actions. And finally, it has supported an expanded reading of the presumption when necessary to ensure its larger, practical applications by highlighting its effect on/by other fundamental rights as relate to the trial.

The Court appears hesitant to apply the presumption to determining permissive uses of coercive pretrial processes such as pretrial detention and intrusive criminal investigatory measures too broadly, however the rationale underlying the presumption remains the operational justification for limits on coercive measures.[42] In the use of pretrial detention it has held that there is no comprehensive prohibition, but rather the essence of Article 6.2 should guide the limit on the use of practices deemed acceptable prior to trial.[43] This must necessarily be true. As the presumption protects the innocent against wrongful convictions and subsequent punishment, the innocent must also be protected against undue harsh treatment prior to the trial.[44] If the trial were to function according to the requirements of the presumption but a gap in application allows that a suspect may languish in pretrial detention for an unreasonable period, it is arguable that punishment has already been enacted and to apply the presumption only at the beginning of a

[42] Directive (EU) 2016/343 on the strengthening of certain aspects of the presumption of innocence and of the right to be present at the trial in criminal proceedings [2016] OJ L65 art 2.
[43] Lonneke Stevens, 'Pretrial Detention: The Presumption of Innocence and Article 5 of the European Convention on Human Rights Cannot and Does Not Limit Its Increasing Use' [2009] 17 European Journal of Crime, Criminal Law and Criminal Justice, 165, 167-168; Van Sliedregt [15] 263.
[44] Herbert Packer, 'Two Models of the Criminal Process' [1964] 113 University of Pennsylvania Law Review 1, 16; Stewart [18].

trial is completely arbitrary and meaningless.[45] Pretrial detention is to be considered as a practical tool for effectuating public safety and is inherently not intended to be punitive in nature, but due to these competing interests, it must be carefully considered.[46] In the context of the ECtHR, member states are required to ensure that pretrial detention does not exceed reasonable duration per Art. 6(1).[47] This approach extends the presumption's legitimacy throughout the criminal justice process in order to ensure its value is solid, rather than an itinerant procedural principle.[48]

Similarly, the Court has held that the presumption remains applicable post-trial to those who are not found guilty. In the case of acquittals, the ECtHR has held that the presumption applies against actions, statements, and manifestations of a belief by state authorities that the acquitted individual is in fact guilty. In *Asan Rushiti v. Austria* the Court held that the issuance of a final acquittal makes even the 'voicing of suspicions regarding the accused's innocence' by a public authority 'incompatible' with the presumption.[49] In this case, the applicant's claim to an awarded compensation was denied following his narrowly achieved acquittal due to a judicial determination that there was still a reasonable, and credible suspicion that the individual was in fact guilty.[50] The ECtHR held that in the case of an acquittal, "the person who was the subject of the criminal proceedings is innocent in the eyes of the law and must be treated in a manner consistent with that innocence."[51] By extending the presumption beyond the scope of trial the Court is not only reinforcing its procedural value, but ensuring that its underlying rationale

[45] Ibid 411.
[46] Halsey Frank, "Shedding Light on the United States Pretrial Services Agency's Pretrial Risk Assessment Tool," *Criminal Justice Magazine*, 2021.
[47] *Letellier v. France* (1991) 14 EHRR 83, para 35.
[48] Marco Mendola, 'One Step Further in the "Surveillance Society": The Case of Predictive Policing' [2016] Leiden University Tech and Law Center.
[49] *Case of Asan Rushti v. Austria* App no 28389/95 (ECHR, 21 March 2000) para 31.
[50] Ibid.
[51] *Allen v. the United Kingdom* [GC], no. 25424/09, para 103, 12 July 2013.

retains legitimacy.[52] Were the presumption to be distinguished by anything other than a finding of guilty, the state may informally and indiscriminately treat the acquitted as guilty and the court's power to find an individual innocent would be practically hollow.

The Court makes a clear distinction between found not guilty and not found guilty, determining that the presumption applies to both. In the case of *Clive v. Germany* the Court held that in order to ensure the presumption is 'practical and effective,' it applies beyond the context of pending criminal proceedings, including following an acquittal, dismissal, or discontinuance,[53] building on a prior holding in *Minelli v. Switzerland*, which held that in the absence of a guilty finding a judicial opinion which suggests that an individual is guilty will violate the presumption, even in the absence of a formal finding.[54] In *Allen v. United Kingdom*, the Court offered this:

> "in keeping with the need to ensure that the right guaranteed by Article 6 § 2 is practical and effective … Its general aim … to protect individuals who have been acquitted of a criminal charge, or in respect of whom criminal proceedings have been discontinued, from being treated by public officials and authorities as though they are in fact guilty of the offence charged. In these cases, the presumption of innocence has already operated, through the application at trial of the various requirements inherent in the procedural guarantee it affords, to prevent an unfair criminal conviction being imposed. Without protection to ensure respect for the acquittal or the discontinuation decision in any other proceedings, the fair trial guarantees of Article 6 § 2 could risk becoming theoretical and illusory."[55]

This interpretation of the presumption may be problematic, as predictive policing relies upon police records which are not often updated to reflect the disposition of legal processes, creating an inaccuracy as regards the disposition of charges.[56] In relying upon risk assessments to

[52] William Schabas, *The European Convention on Human Rights: A Commentary* (Oxford University Press 2015), 299.
[53] *Case of Cleve. v. Germany* App no 48144/09 (ECHR 15 January 2015) para 35.
[54] *Case of Minelli v. Switzerland* App no 8660/79 (ECHR 25 March 1983) para 37.
[55] *Case of Allen v. The United Kingdom*, App no. 25424/09 (12 July 2013) para 94.
[56] Mendola [31] 17.

generate suspicion, police may therefore be acting in reliance on data relative to a prior arrest, despite the fact that a court may have subsequently found him/her not guilty of the offense. However the correct application of the presumption following an acquittal should require that the acquitted be treated the same as any other citizen, not only one against who a prosecution could not establish guilt, but one who should be treated as "material[ly] innocent."[57] It is therefore argued that risk assessments relying on historic crime data for the purpose of building suspicion similarly leads to categorizing individuals according to their degree of risk, creating new distinctions between citizen, suspect, and defendant.[58] It therefore follows that predictive policing predicated on the use of any arrest record that resulted in anything other than a conviction may cause a violation of the presumption when relied upon by policing authorities to identify potential 'suspects.'[59] This misapplication of data directly invokes the Court's assertion that authorities may violate the tenets of the presumption when ascribing guilt in the absence of a guilty finding.[60]

In parallel, one may look to the definitions and standards set forth in the General Data Protection Regulation (GDPR) for better insight into the weight and treatment of personal data as relates to criminal justice. Though the use of personal data for criminal justice processes are specifically governed by the Law Enforcement Directive rather than the GDPR, the way in which the Regulation categorizes data is illustrative of the importance the legislature believes the categories of criminal data to hold. For instance, the disclosure of alleged offenses or charges

[57] Ferguson (n 44), 140.
[58] Amber Marks, Benjamin Bowling and Colman Keenan, 'Automatic Justice? Technology, Crime and Social Control' (Roger Brownsword, Eloise Scotford and Karen Yeung eds) *The Oxford Handbook of the Law and Regulation of Technology* (OUP 2017); Andrew Ashworth, 'Four Threats to the Presumption of Innocence' [2006] 10 The International Journal of Evidence & Proof 241.
[59] *Case of Minelli v. Switzerland* [57] 37.
[60] *Case of Sekanina v. Austria* App no 13126/87 (ECHR 25 August 1993) para 37; Galetta [15] citing *Sekanina v. Austria.*

that did not end in conviction are considered "more likely" to have an "unjustified impact on an individual's interest, rights and freedoms" than other categories of data.[61] Though the use criminal records and data clearly serve relevant and important interests in many cases, they carry a significant amount of meaning and must be used proportionate to their magnitude. The example of non-conviction data may reflect a charge based on suspicion and unproven allegations, yet still have a seriously detrimental effect on the subject individuals' well-being. In applications of policing practices not demonstrably successful such as predictive policing, further determinations of proportionality must be met. Chapter 5 discusses the data protection issues with predictive policing in more depth.

As the Court has clarified the temporal and procedural limits of the presumption,[62] it has also clarified what actions taken by which parties are subject to Article 6.2. Series of cases recognize that police and comparable authorities are state authorities or agents, who have in their control the capacity to make public manifestations that would have the same adverse, substantive effects on an individual's right to be viewed as innocent as if spoken by a courtroom official.[63] The public use of coercive measures by police in the pursuit of an arrest arguably represents a high degree of belief in the guilt of an individual and may increase public perceptions of legal culpability.[64] The unique role of police is indicated by the Court's bright line distinctions

[61] 'Thomson Reuters UK Practical Law' (Thomson Reuters 2020) 0.1.16 123915, 5-8 <http://uk.practicallaw.thomsonreuters.com/Link/Document/Blob/I2f28b74523f111ebbea4f0dc9fb69570.pdf?targetType=PLC-multimedia&originationContext=document&transitionType=DocumentImage&uniqueId=32279c06-722b-42fe-a488-948280c8ffcc&contextData=(sc.Default)>.
[62] *Gogitizde and Others v. Georgia*, app no. 36862/05 (12 May 2015); *Raimondo v. Italy*, app. no. 12954/87 (22 February 1994).
[63] Council of Europe, *Guide on Article 6 of the European Convention on Human Rights; Right to a Fair Trial (Criminal Limb)* (2020) 62; Dovydas Vitkauskas and Grigoriy Dikov, *Protecting the Right to a Fair Trial Under the European Convention on Human Rights; A Handbook for Legal Practitioners* (2nd ed Council of Europe 2017) 113 <https://rm.coe.int/protecting-the-right-to-a-fair-trial-under-the-european-convention-on-/168075a4dd> accessed 10 February 2021.
[64] Campbell [23] 685; Clark [17]

between the police and other influential actors, such as media, political actors, and prosecutors.[65] Indeed, it would diminish the value of the presumption to apply this proscription to only some state authorities with influence on public opinion. In *Allenet de Ribemont v. France*, the Court held that the obligations imposed by the presumption are not limited to officials of criminal courts, but also other authorities.[66] In its assessment, the Court held that a proclamation of guilt by a senior police officer 'firstly, encouraged the public to believe him guilty and, secondly, prejudged the assessment of the facts by the competent judicial authority.'[67] It further determined that statements made by police in the course of an investigation parallel to arrest and detention, have the 'foreseeable' effect of prejudicing the defendant in a public manner, amounting to prejudgment.[68] Therefore the presumption can be infringed by any public authorities who in their official capacity may have some bearing on the outcome of a trial.[69]

The Court distinguishes legitimate acts, such as the factual notification to the public of the existence of a criminal investigation.[70] It further clarifies that actions may be considered indirect statements of a belief in guilt, and may amount to a violation of the presumption, whereas a passive utterance of suspicion alone will unlikely constitute a violation.[71] The Court has further indicated that, '…a fundamental distinction must be made between a statement that someone is merely suspected of having committed a crime and a clear declaration.'[72] It is then a reasonable assertion that the public arrest of an individual in the presence of bystanders is an inherently clear declaration of official suspicion against an individual that supersedes 'mere'

[65] Council of Europe [34] 65.
[66] Case of Allenet de Ribemont v. France [43] para 33.
[67] Ibid 41.
[68] *Case of Allenet de Ribemont v. France* [43] 37; Campbell [23] 694.
[69] Galetta [15] citing *Case of Allenet de Ribemont v. France* [43].
[70] Council of Europe [34] 65.
[71] Liz Campbell, 'A Rights-Based Analysis of DNA Retention' [2012] Criminal Law Review 12, 7.
[72] *Case of Ismoilov and Others v. Russia* App no 2947/06 (ECHR 1 December 2008) para 166.

suspicion.[73] In its analysis in *Marper*, the Court held that though not a formal declaration of guilt, the retention of acquitted individuals' DNA equates to treating innocent people as guilty, in practical contradiction of an acquittal and outside the spirit of the presumption.[74] Predictive policing which is predicated on the use of data, similarly relies on the retention of records of arrests which may have also ended in acquittal.[75] Inclusion in a DNA database, though certainly more intrusive, is only used to compare a subject's record against evidence. Risk assessments used by police are continuously and proactively searching out new correlations and inducing police action. This process clearly meets the standard as described in the reasoning by the Court in *Marper*.

Finally, the Court has demonstrated the importance of maintaining the presumption's essence, even when its aims are achievable only via the implementation of other fundamental rights. For instance, the ECtHR has stopped short of extending the presumption to informal manifestations of suspicion, but it has recognized the power of a label or categorization of suspicious (dangerous) for the practical effects it has on individuals' rights.[76] The Court in *Marper* accordingly supported the value of an individual's right to be seen as innocent and asserted that there is a 'reputational' aspect to the presumption, such that a finding of innocence should not be undermined by a stigma of guilt.[77] The Court has additionally held that to allow the negative impact on a person's reputation may undermine the presumption,[78] in the course of also skirting the protection set forth in Article 8(1) of the ECHR.[79] It accordingly found that the

[73] DeAngelis [39] 56.
[74] Campbell [65] 902-905.
[75] Campbell [23] 5-6, 21-23.
[76] Galetta [15].
[77] Liz Campbell [23]; O.J. Gstrein, A. Bunnik, and A. Zwitter, 'Ethical, Legal and Social Challenges of Predictive Policing' [2019] 3 Catolica Law Review 77, 10.
[78] *Taliadorou and Stylianou v. Cyprus*, nos 39627/05 and 39631/05, para. 26 (16 October 2008).
[79] *Allen v. the United Kingdom* [GC], no. 25424/09, para 94 (12 July 2013); C*ase of S. and Marper v. The United Kingdom* App nos 30562/04 and 30566/04 (ECHR 4 December 2008).

presumption is not violated by the mere retention of acquitted individuals' data in a law enforcement database, the reasoning was instead based on the status of the individual as regards privacy and reputation.[80]

The category of suspect, or even defendant, brings with it some degree of deprivation of liberty as well as other unavoidable varieties of treatment to which an innocent person will not be subjected.[81] Similarly, an individual deemed to be in a class of persons likely to commit a crime, becomes subject to a different type of treatment than the individual considered innocent.[82] The stigma of an arrest and even more so the accompanying record, *de facto* label and separate the guilty from the rest of society.[83] It is well documented that increased police encounters and scrutiny result in 'evidence-based' stigmatization,[84] which extends well beyond the criminal justice system into applications for jobs, housing, and credit.[85] Studies demonstrate that in both the U.K. and U.S. criminal justice systems, which utilize predictive policing at increasing levels, criminal stigmatization often extends to whole communities. In this sense the presumption may also be viewed as a protection against "wrongful criminalization," accounting for the myriad ill-effects of a wrongful conviction.[86] Per the above discussion on the use of a DNA repository, the Court further held that to be treated as guilty after having been found not guilty of an offence

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[80] Jamie Grace, "Human Rights, Regulation and the Development of Algorithmic Police Intelligence Analysis Tools in the UK," SSRN, December 18, 2018, http://dx.doi.org/10.2139/ssrn.3303313.; *Marper v. UK* [38]; Campbell [23] 698.
[81] Peter DeAngelis, 'Racial Profiling and the Presumption of Innocence' [2014] 43 Netherlands Journal of Legal Philosophy 1, 43, 54.
[82] Pamela Ferguson, 'The Presumption of Innocence and Its Role in The Criminal Process' [2016] Criminal Law Forum 27, 131, 141.
[83] David Wolitz, 'The Stigma of Conviction: Coram Nobis, Civil Disabilities, and the Right to Clear One's Name' [2009] Brigham Young University Law Review 5, 1277, 1276.
[84] Gstrein, Bunnik, and Zwitter [42] 10; Duff [13] 13.
[85] Amnesty International [10].
[86] Katerina Hadjimatheou, "Surveillance, the Moral Presumption of Innocence, the Right to Be Free from Criminal Stigmatisation and Trust" (SURVEILLE Seventh Framework Programme, September 30, 2013); Victor Tadros, "The Ideal of the Presumption of Innocence," *Crim. Law and Philosophy* 8 (2014): 449–67.

leads to a presumption against innocence and risks stigmatization.[87] It additionally found that inclusion in a database used to locate criminals '…enlarges the category of 'suspect,"'[88] and that this could not be considered necessary in light of the undue consequences on individuals' reputations.[89] Applied to predictive policing, the category of suspect very clearly encompasses those considered to be more risky or dangerous than others.

The ECtHR has given strong indications that the presumption when applied to predictive policing would be interpreted with a view toward its outward effects on individual rights, from the starting point of ensuring its normative value. According to the existing caselaw, a category of dangerous, so indicated by police records, indeed may preclude one's potential to remain legally innocent for practical purposes.

ii. Mid-level interpretation: Case of the United Kingdom

The United Kingdom, as a member of the Council of Europe largely subscribes to the above description of the presumption as it is implemented according to the ECtHR. However it presents several unique attributes that are worth briefly outlining. First, unlike most other CoE countries, the U.K. is a common law system, in which the adversarial process is the manner of criminal trial. Second, the U.K. is similar to the United States in that it has been using predictive policing for longer, and more predominantly than most continental European countries. These together have an effect on the presumption in a larger sense, positioning it somewhere between the more narrow and more expansive approaches.

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[87] Mendola[31] 15; Katerina Hadjimatheou, 'Surveillance, the Moral Presumption of Innocence, the Right to Be Free from Criminal Stigmatisation and Trust' (SURVEILLE Seventh Framework Programme, 30 September 2013).
[88] The ECHR refers to this as the 'pérennisation de la catégorie de "suspect"' Galetta [15].
[89] *Case of S. and Marper v. United Kingdom* [38]; Ibid.

For centuries the law of England has included the presumption as a key mediator of the power of the state in juxtaposition to the citizen, namely the accused.[90] Its function is twofold: to ensure the consistent fairness of the trial and setting the burden of proof upon the state.[91] With the passage of the Human Rights Act of 1998 (HRA), which states, "Everyone charged with a criminal offence shall be presumed innocent until proved guilty according to law," Article 6 of the ECHR was explicitly codified in English law.[92] Though caselaw of the ECtHR is persuasive on the courts of England and Wales, the common law system still requires that "where there is a conflict between domestic and European jurisprudence, courts below the Supreme Court…are bound by domestic precedents."[93] Though not a major matter of discrepancy, an increasing chasm on data protection and privacy may be influential in this area of law. Recent case law demonstrates the willingness of the U.K. to engage on measures leaning further toward security than privacy. Much of the scholarly literature on the subject of the presumption in English law focuses on whether presumption should be as a strictly procedural measure, in which the presumption requires facts be provided at trial by which and only by which a finding of guilty may be achieved. However the second position takes a step back from the trial to argue that the presumption may be violated by the mere criminalization of certain acts by legislating elements of a crime which require a reverse burden to overcome.[94] The HRA further provides that the imposition of reverse burdens of proof on criminal allegations are in contravention of the

[90] Ashworth, "Four Threats to the Presumption of Innocence."
[91] Andrew Stumer, The Presumption of Innocence: Evidential and Human Rights Perspectives (Oxford: Hart Publishing, 2010), xxxviii.
[92] United Kingdom Human Rights Act 1998, Article 6. <https://www.legislation.gov.uk/ukpga/1998/42/schedule/1/part/I/chapter/5>.
[93] "The Code for Crown Prosecutors, Legal Guidance," September 18, 2019, https://www.cps.gov/uk/legal-guidance/human-rights-and-criminal-prosecutions-general-principles.
[94] Federico Picinali, "Innocence and Burdens of Proof in English Criminal Law," *Law, Probability and Risk* 13, no. 3–4 (2014): 243–57.

presumption, whereas the ECtHR has limited the reversal of burdens to those strictly necessary.[95] These debates deepen the substantive/procedural divide on applying the presumption in the U.K.

The narrow approach which focuses on a procedural instruction in the presumption, but broadens it to the criminal act itself to include questions as to correctly defining the crime. This may be of importance to predictive policing, in which context is critical to determining suspicion. For instance, in offenses in which the act is the first element of the offense (carrying contraband), and the second element is motivational (with intent to..). These second elements necessarily invoke a reverse burden, as the first element being proven, the defendant is in the unlucky position to offer a counter-explanation to negate the second element, the intent.[96] In these cases courts of the U.K. have followed the ECtHR in that a reverse burden is not automatically in opposition of the presumption, however states must use it only within "reasonable limits" while minding the "rights of the defence."[97] In other words, reverse burdens must be justifiably reasonable and proportionate[98] between the concerns of public security and the defense rights.[99]

Crimes which include elements that reverse the burden are termed "statutory burdens" and may be either expressly stated within the statute, or implied based on the nature of the act.[100] Courts have further held that if the element which requires a reverse burden of proof is not a necessary element to the crime, there is no infringement of the presumption. In this way English

[95] Federico Picinali, 'Innocence and Burdens of Proof in English Criminal Law' (2014) 13 Law, Probability and Risk 243, 2.
[96] Caroline Gans-Combe, 'Automated Justice: Issues, Benefits and Risks in the Use of Artificial Intelligence and Its Algorithms in Access to Justice and Law Enforcement', *Ethics, Integrity and Policymaking*, vol 9 (2022), 181.
[97] *Salabiaku v. France* (App no. 10589/83) 1991, 13 EHRR 379, 388.
[98] For a delineation of the steps taken by courts to determine whether a reverse burden is appropriate, *see* Victor Tadros and Stephen Tierney, 'The Presumption of Innocence and the Human Rights Act' (2004) 67 The Modern Law Review 402, 404 *citing R v. Director of Public Prosecutions*, Ex p Kebilene, 2 AC 326 (2000).
[99] *R. v. Williams* EWCA Crim. 2162 (2012), para 19.
[100] Victor Tadros and Stephen Tierney, 'The Presumption of Innocence and the Human Rights Act' (2004) 67 The Modern Law Review 402.

courts are afforded room to pass judgment on the appropriateness of substantive criminal law and in so doing act as a check in common law.[101] Indeed the "substance" of the presumption is considered to be the focal point of the presumption.[102] The debate on the legitimacy of reverse burdens dovetails with a comparable review of regulatory and compliance based enforcement, which act as a preventative measure for larger crimes by criminalizing lesser acts. As the larger debate as to the scope of the presumption seems to center on the matter of reverse burdens of proof, English courts seem to straddle the divide between broad and narrow classifications of the presumption.

The types of predictive policing programs utilized in the U.K. include both person- and place-based predictions. In addition to category of crime and the related data such as date and time, one particular program for assessing individuals by risk category takes into account anti-social behavior incident reports for the prior two years, a noteworthy departure from many other prediction programs.[103] Person based risk assessments and such classifications of anti-social behavior speak strongly to the debate on dangerous versus innocent *people*. Many of the predictive programs described above also utilize stop and search data in their crime data.[104] As indicated in the case of *Marper*, the collection of data on such a wide scale is common practice and in many situations outside the appropriate scope of police data retention.

The tendency toward rooting out the risk of 'dangerous' individuals seems to resonate in the U.K. The pending (as of writing) 'Police, Crime, Sentencing and Courts Bill' (Bill) expands multiple powers of the government in order to provide a tough on crime stance that is intended to

[101] *Sweet v. Parsley* AC 132 (1970); 53 Cr App R 221 (1969).; *also, Gammon Ltd. v. Attorney General of Honk Hong* AC 1 R 194 (1985).
[102] *R. v. Lambert*, 2 AC 545 (2002); 2 Cr App R 28, at 526.
[103] Couchman at 58-59.
[104] Big Brother Watch at 12; Alexander Babuta and Marion Oswald, "Data Analytics and Algorithms in Policing in England and Wales, Towards a New Policy Framework" (Royal United Services Institute, February 2020) at 5.

increase public security.[105] The Bill, which in its original text includes the word 'risk' 189 times, refers to "high-risk" and "at-risk" to describe individuals throughout in order to "justify 'pre-emptive interventions.'"[106] In addition, the Bill proposes an extension of a stop and search power practice entitled 'Serious Violence Reduction Orders' (SVRO) which allow the issuance of conditions and prohibitions on individuals who have been convicted of certain crimes.[107] The extension of the SVRO would also make an associate of an SVRO subject at the time of the crime also a potential SVRO recipient; and the SVRO conditions may also be implemented for failure to comply with the SVRO as a separate incident.[108] Neither offense actually entails the criminal behavior at the initial core of the SVRO justification.[109] As stated above, though the HRA is intended to codify the ECHR, domestic public security laws may allow the circumvention of ECHR standards on the ground.

Also per the Bill, the pre-emptive use of criminal data for non-criminal uses, such as the Enhanced Criminal Record Certificate (ECRC) has likewise raised question of the presumption. The ECRC is generally used for criminal records, not exclusive to convictions, which may be relevant to vetting potential employees for agencies that work with vulnerable populations. An appellate court affirmed that the disclosure of a rape allegation, though acquitted, was not in violation of the presumption because an acquittal does not conclusively mean the individual did

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[105] Police, Crime, Sentencing and Courts Bill, Bill 268-EN, introduced Legislative Session 2019-21 <https://publications.parliament.uk/pa/bills/cbill/58-01/0268/200268.pdf>.
[106] Fair Trials, 'Written Evidence Submitted by Fair Trials, Police, Crime, Sentencing and Courts Bill' Committee Stage briefing PCSCB28 <https://publications.parliament.uk/pa/cm5802/cmpublic/PoliceCrimeSentencing/memo/PCSCB28.htm> accessed 2 February 2022, para 1.15.
[107] Police, Crime, Sentencing and Courts Bill, Clause 139.
[108] *Id.*
[109] Fair Trials, 'Written Evidence Submitted by Fair Trials, Police, Crime, Sentencing and Courts Bill' Committee Stage briefing PCSCB28 <https://publications.parliament.uk/pa/cm5802/cmpublic/PoliceCrimeSentencing/memo/PCSCB28.htm> accessed 2 February 2022, para 2.4-2.5.

not commit the offense. It further held that the disclosure is appropriate so long as the policing agency responsible did not indicate a belief in the guilt of the applicant.[110] However it is also true that by making the disclosure, a state authority has apparently taken the claim seriously enough to record and investigate, thereby contributing a degree of legitimacy that may have very real, adverse effects on the individual's prospects even in the absence of an overt adverse statement.[111] This may be another example, like the case of *Marper,* in which the presumption may be in question but better suited to a legal remedy under Art. 8. Returning to the discussion on pretrial detention and the presumption, the Bill further increases the likelihood that an individual will be subject to pre-charge bail, in which the subject is put on conditions pending a police investigation. In other words the subject may be required to post bail despite the fact they have not been charged with a crime. The Bill proposes extending the allowable pre-charge bail duration from 28 days to three months.[112] These legal reforms operational in a common law system risk the proper enjoyment of the presumption by enlarging the lawful exceptions to its application.

iii. Broad interpretation: Case of France

France is included here as a demonstration of a criminal justice system which explicitly includes the presumption as a critical feature of pre-charge due process. The presumption is embodied in Article 9 of the *Déclaration des droits de l'homme et du citoyen* and similarly codified in the Constitution.[113] Though its implementation waned during the Revolutionary

[110] *R. (AR) v. Chief Constable of Greater Manchester Police,* EWHC 2721 (2013).
[111] Joe Purshouse, "Non-Conviction Disclosure as Part of an Enhanced Criminal Record Certificate: Assessing the Legal Framework from a Fundamental Human Rights Perspective," *Public Law*, no. 4 (2018): 668–86.
[112] Police, Crime, Sentencing and Courts Bill, Part 2, Chapter 4.
[113] Constitution of the Republic of France, October 4, 1958 <https://www.conseil-constitutionnel.fr/sites/default/files/as/root/bank_mm/anglais/constiution_anglais_oct2009.pdf>.

years, it has in recent times been renewed in several areas of the *Code de procédure pénale*. This may similarly act to explain the general reticence by the Republic to enact predictive policing on a large scale.[114] This section will not offer a comprehensive analysis of the presumption and herein acknowledges that areas of law, such as pretrial detention in practice may be quite restrictive. Instead, it illustrates a broad codification of the presumption in criminal justice processes, specifically to pre-charge investigations.

As in the U.K., the issue of personal data is one that receives a great deal of the attention in discussions on predictive policing. In France much of the hesitance toward the use of predictive policing seems to stem from the notion that the mass collection and use of personal data by police would amount to an automated surveillance, which has already been debated in the context of counterterrorism and facial recognition technology.[115] The data protection body which has overseen predictive policing software trials to date in France,[116] CNIL (*Commission nationale de l'informatique et des libertés*) has been opposed to these sophisticated technologies due in large part to the fact that individuals in public places are not able to easily oppose or challenge (or potentially even identify) their use.[117] However relevant to the above discussion on law enforcement DNA databases in the U.K., as well as the analysis set forth by the ECtHR in *Marper*, it is worth noting that France also utilizes large-scale databases that track the convicted and accused individuals of crimes for reference in future investigations.

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[114] "Facial Recognition: For a Debate Living up to the Challenges" (CNIL, December 19, 2019), https://www.cnil.fr/en/facial-recognition-debate-living-challenges.
[115] Simon Barbarit, "Lutte-Antiterroriste: Qu'est Ce Que La Surveillance Par Algorithme?," April 28, 2021, https://www.publicsenat.fr/articles/politique/lutte-antiterroriste-qu-est-ce-que-la-surveillance-par-algorithm-188855.
[116] One of the few and best known predicting policing trials in France to date remains PAVED, in which 11 Departments tested a system for predicting burglaries and vehicle thefts from 2017-2019. PAVED showed some positive effects on vehicle theft but little to no difference in lowering rates of burglary. Yann Lecorps and Gaspard Tissandier, "PAVED with Good Intentions? An Evaluation of a French Police Predictive Policing System," December 29, 2022, http://dx.doi.org/10.2139/ssrn.4314831.
[117] CNIL, Deliberation no. 2020-136 (17 December 2020), regarding specifically the use of intelligent videosurvillance to monitor the obligation to wear masks during the COVID-19 lockdown.

One such databased, the French fingerprint database, *Fichier national automatisé des empreintes génétiques* (FNAEG), collects the fingerprints of individuals who have been found guilty or were the object of a criminal investigation.[118] Similarly, the fingerprints of missing persons and unidentified, deceased individuals are maintained in the FNAEG, as well as some categories of kin. The allowable duration for the retention of the records varies by the category of individual and factors such as the reason for their being included in the system, the nature and severity of the related offense if applicable, and whether they are a minor. As the data of acquitted individuals may in some circumstances be included, the retention of these data seem to run against the holding in *Marper*. A review of the system by the Constitutional Council found that the database was constitutional, as it was used only for the identification of individuals after manually and proactively testing against biometric evidence.[119] As ensured by the Constitutional Council, derogations on the presumption must be in proportion to the offense, as very clearly defined in the FNAEG regulation on allowable inclusions and compulsory omissions, as well as categories of data considered temporary.[120] The law also restricts the use of FNAEG for particular categories of searches, such as for employee background checks. As the database is well circumscribed in its function, it is likely to be found as more proportionate to its objectives than those achieved by the use of predictive policing risk assessments.

As stated above, this section will not fully unpack practical applications or shortcomings of the French implementation of the presumption. Suffice only to say that pretrial detention is

[118] "Fichier National Automatisé Des Empreintes Génétiques (Fnaeg)," *France Direction de l'information Légale et Administrative (Première Ministre)*, January 26, 2022, https://www.service-public.fr/particuliers/vosdroits/F34834.
[119] Conseil Constitutionnel, Décision 2010-25 QPC du 16 Septembre, 2010 (16 September 2010) <http://www.legifrance.gouv.fr>.
[120] H. Westermark et al., "The Regulation of the Use of DNA in Law Enforcement (Austria, Belgium, Canada, Denmark, Espagne, France, Germany, Italy, The Netherlands, Slovakia, Sweden, Taiwan, United Kingdom, USA, European Union) Current to: 28.08.2020," August 28, 2020, https://www.isdc.ch/media/1953/e-2020-02-20-016-use-of-dna.pdf.

outside of the scope of this work but does present a problematic case. A report by the French Ministry of Justice stated in 2021, that 28 percent of the French prison population was as yet unsentenced, that is, legally innocent and awaiting trial.[121] Though currently pending reform, the French justice system allows somewhat broad and vague justifications for pretrial detention.[122] Traditionally criminal justice in France was approached as three discrete phases, 1. A police phase for the non-judicial investigation; 2. Preparation of the charge and defense (investigation); and 3. The public judgment.[123] The police custody/investigation and judicial investigation phases may be subject to differing levels of detention and restrictions.[124] Following the "Outreau Affair," which resulted in an intense soul-searching in the French judiciary, as well as formal regrets and apologies by the Prime Minster for what he categorized as "un désastre judiciaire sans précédent," the issue of pretrial attention has again been raised.[125] However most relevant to predictive policing is 'Phase 1: the custodial questioning of suspects by police,' even prior to the issuing of a charge.

An assessment of the evolution of the Code of criminal procedure demonstrates a strong belief by the government that the presumption is also very relevant to policing practices. In June,

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[121] Ministere de la Justice Administration penitentiaire, Bureau de la Donnee, 'Mouvements au cours du 2eme trimestre 2021, Situation au 1er juillet 2021,' *Statistique trimestrielle des personnes ecrouees en France* <http://www.justice.gouv.fr/art_pix/Trim_2107.pdf>. *See also*, Fair Trials International, 'Communique of the Local Expert Group, Pretrial Detention in France' (2013).

[122] If the only means necessary to ensuring the following goals is the use of pretrial detention, it may be ordered according to Article 144, of the Code de procedure penale, Sous-section 3: 1. To preserve necessary evidence; 2. To prevent pressure on witnesses or victims as well as on their families; 3. Prevent fraudulent consultation between the accused and accomplices; 4. Protect the subject of investigation; 5. Ensure that the accused is kept at the disposal of the justice system; 6. Prevent the recurrence of the offense; 7. To end an exceptional and persistent disturbance to public order caused by the seriousness of the offence, the circumstances of its commission or the extent of the harm it has caused. This disturbance cannot result from the media repercussions of the affair alone. (English translation, paraphrased). De la detention provisoire <https://www.legifrance.gouv.fr/codes/article_lc/LEGIARTI000021332920>.

[123] Conseil Constitutionnel, 'Commentary on decision no. 2010-14/22 QPC – July 2010, Mr. Daniel W. and Others,' *The Notebooks of the Constitutional Council*, Notebook No. 30.

[124] Serge Portelli, 'Entre Le Soupcon et Le Verdict, Quel Espace?' (2006) 6 Revue Projet (C.E.R.A.S.) 19, 20.

[125] Delphine Roucaute, Alexandre Pouchard and Leila Marchand, 'Comment l'affaire d'Outreau a ebranle la justice francaise,' *Le Monde* (19 May 2015) < https://www.lemonde.fr/les-decodeurs/article/2015/05/19/comment-l-affaire-d-outreau-a-ebranle-la-justice-francaise_4636450_4355770.html>.

2000 the legislature passed Law No. 2000-516, 'strengthening the protection of the presumption of innocence and the rights of victims.'[126] The law adapted the Code of criminal procedure to include the following prefacing article, which states that "Anyone suspected or prosecuted is presumed innocent until his guilt has been established. Attacks on [its] presumption of innocence are prevented, remedied and repressed under the conditions provided for by law." It further follows that any "measures of constraint" must be "strictly limited" to what is necessary and "proportionate to the gravity of the alleged offense and not to undermine the dignity of the person."[127] It proceeds to limit and delineate the terms of lawful police custody of an individual, including measures permissible, duration and conditions of custody, and rights afforded to the individual.[128] In 2018, Directive (EU) 2016/343 on the strengthening of certain aspects of the presumption of innocence and the right to be present at the trial in criminal proceedings was transposed into French law. This Directive, though applying to the context of criminal proceedings recognizes that "at all stages of the criminal proceedings, from the moment when a person is suspected or accused of having committed a criminal offence, or an alleged criminal offence…" has a real effect on future proceedings.[129] It is recognized that the pre-trial phase of a criminal proceeding encapsulates the majority of evidence collection and analysis and therefore directly impacts proceedings.[130]

[126] Republic of France, Loi no. 2000-516 du 15 juin 2000 renforcant la protection de la presomption d'innocence et les droits des victimes, (15 June 2000) <https://www.legifrance.gouv.fr/jorf/id/JORFTEXT000000765204/>.
[127] Id., Art. 1 III.
[128] Id., Chapitre Ier, Section 1, 'Dispositions relatives a la garde a vue.'
[129] Directive (EU) 2016/343 of the European Parliament and of the Council of 9 March 2016 on the strengthening of certain aspects of the presumption of innocence and of the right to be present at the trial in criminal proceedings, Art. 2.
[130] European Union Agency for Fundamental Rights, "Presumption of innocence and related rights," Professional Perspectives (2021), cited by Athina Sachoulidou, "Going beyond the 'Common Suspects': To Be Presumed Innocent in the Era of Algorithms, Big Data and Artificial Intelligence," *Artificial Intelligence and Law*, February 22, 2023.

These provisions very clearly highlight the legislative view that the presumption applies to policing and is not strictly constrained to courtroom processes, with remedy for findings to the contrary. The limitations put forth in the highlight the need for proportionality, due strictly to applying the presumption as a right of the accused. These modifications drastically reformed the way in which police may bring individuals into custody and treat them within that time. Prior to the passage of the law, lawyers were *de facto* without the right to accompany their clients to custodial interrogation with the exception of particular circumstances and strict limits.[131] The notion of the presumption in policing was further clarified and reinforced by the Court. In making a priority preliminary ruling on a prior decision of the *Cour de cassation*,[132] the Constitutional Council ruled that certain articles of the were in violation of defendants' rights as set forth in Article 9 of the Constitution (on the presumption).[133] The Council, which exercises the ability to determine whether state actions are necessary and in proportion to any infringement on an individual freedom,[134] found that the defendant was unable to benefit from effective assistance of counsel, and that they were not notified of the right to remain silent. It held that as statements made in custody have direct effect on the trial, they implicate a presumption and therefore counsel must be available. As a result of these findings, Parliament adopted a new law with reforms to restrictions and allowances to police custody, which was implemented on July 1, 2011.[135]

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[131] Jacqueline Hodgson, "The French Garde À Vue Declared Unconstitutional," *Criminal Law and Justice Weekly*, August 24, 2010, Warwick School of Law Research Paper Series edition.
[132] Cour de cassation, Decision no. 12030 (31 May 2010).
[133] Conseil constitutionnel, Deceion no. 2010-14/22 QPC (30 July 2010), finding several provisions of the Code of Criminal Prodcedure unconstitutional, specifically as relates to the conditions of police custody and rights afforded to the subject of questioning. The articles invalidated were Articles 62, 63-1, 63-4 para 1-6, and Art. 77.
[134] Conseil Constitutionnel, 'Commentary on decision no. 2010-14/22 QPC – July 2010, Mr. Daniel W. and Others,' *The Notebooks of the Constitutional Council*, Notebook No. 30.
[135] Republic of France, Loi no. 2011-392 du 1 juin 2011 relative à la garde à vue, (1 June 2011) , <https://www.legifrance.gouv.fr/loda/id/JORFTEXT000023860729/>.

This decision, which made necessary the review and amendment of the relevant articles of the Criminal Code, was in alignment with a series of cases of the ECtHR that recognized the role of earlier criminal processes on fair trial rights. Namely, the Court ruled that "in order for the right to a fair trial to remain sufficiently 'practical and effective'…Article 6.1 requires that, as a rule, access to a lawyer should be provide…The rights of the defence will in principle be irretrievably prejudiced when incriminating statements made during police interrogation…are used for a conviction."[136] This case outlined the effects of pre-charge processes in the criminal trial process, acknowledging their importance to fair trial processes.[137] These together signal recognition by the French state that policing is also subject to the presumption as its effects on a trial cannot be discarded.

By the way, even journalism and any kind of public presentation of a person as guilty before she was condemned by a criminal court (article 9-1 of the **civil** code).

2. Narrow interpretation: Case of the United States

As established, the presumption is generally interpreted in terms of procedure in adversarial settings and its main function is to ensure that the burden of proof is correctly applied between parties.[138] In inquisitorial systems it likewise provides protection to the individual as regards official public treatment and investigatory measures, however it lacks the hard procedural shell it is afforded in the adversarial context which arguably constrains it to the courtroom.[139] In one of the most narrow, Western interpretations of the presumption, this sub-

[136] *Salduz v. Turkey*, No. 36391/02 (27 November 2008).
[137] *See also, Imbrioscia v. Switzerland*, No. 13972/88 (24 November 1993), in which the Court held that the primacy of the right to a fair trial in Article 6 does not mean that there is no application to "pretrial proceedings."
[138] Elies Van Sliedregt [15] 247–67; Liz Campbell, 'Criminal Labels, The European Convention On Human Rights And The Presumption of Innocence' [2013] 76 The Modern Law Review 4, 681.
[139] Weigend [14] 290-291.

section provides the example of the American contextualization of the presumption. Though heralded as a "golden thread"[140] in the formulation of a fair criminal trial, its application is decidedly much more narrow.[141] One of the striking characteristics of the presumption as applied in the U.S. is its apparent dual treatment. In the course of trial the presumption performs a very strong and ceremonious instruction to the court that conveys the somber nature of the burden of proof. In prescribing the 'beyond a reasonable' doubt standard, it shields defendants against wrongful conviction while also sending the jury a strong message as to its societal importance. However at the same time, it bears little weight prior or subsequent to trial.[142] This section will first review case law and guidance from the courts in the form of jury instructions to illustrate the predominant role that the presumption plays. It will then outline the role of the presumption in criminal sentencing to illustrate the clear distinction in applying the presumption.

i. Courtroom application of the presumption

The presumption is a tenet of procedural due process according to the Due Process Clause of the Fourteenth Amendment to the Constitution.[143] Its characterization as a procedural due process guarantee sets it apart from substantive due process. This distinction is a curious, but clear indication of its procedural purpose. Whereas substantive due process protects intrusions on liberties which may be considered tangible, such as property ownership, the right to be considered innocent as manifest as physical liberty is considered a matter of procedural due process. Procedural due process requires that in the case of a dispute an individual is entitled to

[140] The term "golden thread" running through the criminal justice process comes from the U.K., *Woolmington v DPP*, UKHL 1, AC 462; (1936).
[141] Lum, "The Presumption of Innocence Is like a Golden Thread in the Criminal Justice System."
[142] Stewart (n 5), 410.
[143] Ferguson, "The Presumption of Innocence and Its Role in The Criminal Process."

notice, the opportunity to be heard, and an impartial tribunal, both in the criminal and civil contexts.[144] In contrast to the stance taken by the ECtHR, a clear preference in security over dignity may be seen as the driving force of this understanding of the presumption.[145] However despite whatever damage may be done to the application of the presumption in a given case prior to trial, its weight is protected within the confines of the courtroom. One way in which this stance is protected is through the use of a jury as a fact-finding body.

In a criminal case, there must be unanimous jury consensus that the prosecution has proven the elements of its case beyond a reasonable doubt. In the civil context the burden is often lower, frequently set as a default at a preponderance of the evidence. This reflects the gravity of denying an individual liberty, or as is the case in the United States, even his/her life.[146] Though the use of civil sanctions either formal or informal may still be severely detrimental to the individual, the high standard of proof in the criminal trial is intended to protect the right to liberty. The role of the jury in making determinations of fact may be seen to serve two purposes. The first takes the weight of depriving a citizen of liberty from the state, such that a determination of fact may be assessed by a neutral party, distinguished from the state which also embodies the prosecution. Inversely, the act of jury service reinforces the ideal of legal certainty.[147] By demonstrating conviction to be as serious and weighty as possible, individuals may be assured that they will receive similar, fair treatment by their fellow citizens and the state, and in turn this lends legitimacy to the rule of law.[148]

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[144] *Mullane v. Central Hanover Bank & Trust Co.*, 339 U.S. 306 (1950).
[145] Quintard-Morenas, "The Presumption of Innocence in the French and Anglo-American Legal Traditions."
[146] For a discussion on the Presumption in the U.S. and capital cases, see, Richard Lippke, "The Presumption of Innocence in the Trial Setting," *Ratio Juris*, May 22, 2015.
[147] Wilkinson (n 7), 605.
[148] Sherman Clark, "The Juror, the Citizen, and the Human Being: The Presumption of Innocence and the Burden of Judgment," *Criminal Law and Philosophy* 8 (2014): 421–29.

Conveying the burden on the state to prove its case is imparted to the jury in the instructions by the judge, who as trier of law ensures that the trier of fact correctly understands its role. It is frequently argued that the jury instructions are largely intended to impart the weight of a finding of beyond a reasonable guilt upon the members of the jury, in addition to explaining the charges in lay terms.[149] The terms of jury instructions vary by jurisdiction and courts within, but generally follow this general format:

> "The defendant is not required to prove that he/she is not guilty. In fact, the defendant is not required to prove or disprove anything. To the contrary, the People have the burden of proving the defendant guilty beyond a reasonable doubt. That means, before you can find the defendant guilty of a crime, the People must prove beyond a reasonable doubt every element of the crime including that the defendant is the person who committed that crime. The burden of proof never shifts from the People to the defendant. If the People fail to satisfy their burden of proof, you must find the defendant not guilty. If the People satisfy their burden of proof, you must find the defendant guilty."[150]

Similarly, a diligent defense attorney will also invoke the principle that the defendant as he/she sits before the court remains legally innocent of the offence until the point of a verdict and that only a finding of beyond a reasonable doubt, based solely on the facts presented in the courtroom can transform the accused into the convicted. The U.S. Supreme Court has consistently held that the defendant is to be found innocent unless all elements necessary to execute the crime can be satisfactorily proven beyond a reasonable doubt.[151] The presumption is so important in the course of the trial, that "strong measures" are taken to ensure that juries serving in trials subject to extensive publicity are formally sequestered in confined quarters for the duration.[152] However

[149] *Taylor v. Kentucky*, 436 U.S. 478 (1978).
[150] Final Jury Instructions, Criminal Jury Instructions & Model Colloquies, New York Unified Court System <https://nycourts.gov/judges/cji/5-SampleCharges/SampleCharges.shtml> last accessed 25 Jan. 2022.
[151] *In the Matter of Samuel Winship*, 397 U.S. 358 1970.
[152] *Sheppard v. Maxwell,* 384 U.S. 333, 357-63 (1966).

despite the lofty foundations from which the presumption springs, the caselaw of the Supreme Court has effectively eroded its power such that it may only apply nearly exclusively to the trial process. In one of the most impactful cases challenging an application of the presumption, the Court held that the standard of 'beyond a reasonable doubt' is one fully separate from the presumption. In the relevant case, the Court held that a minor who had been determined by a state juvenile court to have committed a crime on a preponderance of the evidence, was due the right to be convicted only upon proof beyond a reasonable doubt, as any adult would also be subject. In weighing the due process rights afforded to juveniles in criminal cases, it held that the reasonable doubt standard is "concrete substance for the presumption of innocence."[153] Where a defendant may claim to have been prejudiced as a result of stigma, the Court has taken a "stigma-plus" approach, in which the claimant must show stigma as well as a concrete harm (such as loss of employment).[154]

While this chapter argues for a flexible contextualization of the presumption, the precedential nature of case law in the U.S. has allowed a continued winnowing of the right. Over the course of the late twentieth century, the Court became increasingly likely to frame the presumption in its procedural role as a response to 'tough on crime' political pressures. In *Bell v. Wolfish*, the Court expanded that the purpose of the presumption is to allocate "the burden of proof in criminal trials; it also may serve as an admonishment to the jury to judge an accused's guilt or innocence solely on the evidence adduced at trial."[155] This instruction both solidified the role of the presumption in the trial while further circumscribing its potential expansion outward. However despite this being its primary purpose, the Court later held that a judicial failing to

[153] *In the Matter of Samuel Winship*, 397 U.S. 358 1970.
[154] Wayne Logan and Andrew Guthrie Ferguson, 'Policing Criminal Justice Data' (2016) 101 Minnesota Law Review 541, 576, citing Paul v. Davis, 424 U.S. 693 (1976).
[155] *Bell v. Wolfish*, 441 U.S. 520, 533 (1979).

explain the relative burdens of proof to the jury may amount to an automatic case reversal, but omitting the presumption in the course of jury instructions is not a constitutional requirement in every case but instead should be considered as a part of a 'totality of the circumstances' assessment.[156] As the foregoing sub-section discussed, the application of the presumption in French criminal procedure may differ across stages of the criminal process, the U.S. offers a comparably bifurcated approach. Though the presumption remains a critical part of the criminal trial, its bounds outside the courtroom have been considerably frayed by this narrowing.

ii. The presumption beyond the perimeters of the courtroom

Despite the strong invocation of the presumption as a pillar of the criminal trial in the U.S., its reach does not far exceed the confines of the adjudicatory phase. As highlighted above, the role of police may hold a high degree of influence over public opinion toward a suspect or defendant. Indeed the use of the press to showcase 'successful' policing, sensationalize a murder investigation, or meet target quotas is generally accepted practice – up until the point that a jury is seated, in apparent contradiction of the presumption itself.[157]

Similarly, the use of pretrial detention or bail is determinatively outside the application of the presumption.[158] The most relevant restriction on the use of bail is the Eighth Amendment to the Constitution which dictates that "excessive bail shall not be required" in order to avoid detention prior to trial.[159] Excessive bail is considered to be that which is in excess of what is necessary to ensure attendance of the defendant.[160] Though public security and assurances that

[156] *Kentucky v. Whorton*, 441 U.S. 86, 789-90 (1979); See also, LeRoy Pernell, 'The Reign of the Queen of Hearts: The Declining Significance of the Presumption of Innocence - A Brief Commentary' (1989) 37 Cleveland State Law Review 393 at 413; *Coffin v. United States*, 156 U.S. 432, 453 (1895)..
[157] Goff, How Police Reports Became Bulletproof.
[158] *Bell v. Wolfish*, 441 U.S. 520, 533 (1979).
[159] Eighth Amendment to the Constitution of the United States (1791).
[160] *Stack v. Boyle*, 342 U.S. 1, 5 (1951).

the individual will attend the trial are paramount to the determination of whether bail will suffice, there is no judicial requirement that the presumption, play any role in this process. Despite this, it has been linked to early holdings on the presumption in which bail is considered a critical part of limiting pretrial detention, despite modern debates on its implementation.[161]

In addition to the deprivation of liberty, there are many negative aspects to detaining individuals prior to a court hearing that further intrude upon applying the presumption at trial. These include the physical appearance of the defendant when appearing for the trial, for example if forced to wear a jail uniform; their ability to access a lawyer; and the likelihood that they will take a plea deal in order to obtain a shorter sentence and ameliorate time in custody.[162] Even if it is not the stated purpose of pretrial detention to achieve a high level of confessions, it is a practical effect which is well-documented across the American criminal justice system that plea deals are frequently taken by detained individuals who recognize their poor odds of success in a jury trial. This unfortunately also cuts off their opportunity to pursue a future appeal.[163] Despite this, the Court has held that the presumption is not relevant to a determination of whether pretrial detention is appropriate, as a finding of any possible reason for the detention beyond punishment as justification makes its use permissible.[164] Instead the use of pretrial detention is considered regulatory, rather than punitive, and therefore permissible.

Similarly, in the presumption is decidedly absent in the sentencing phase of a criminal trial. This is true of the myriad considerations allowed to judges, which include the use of prior criminal history, including police stops or charges that did not result in conviction; acquittals;

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[161] *Id* at 285*, citing*, *Hudson v. Parker*, 156 U.S. 277 (1895); *also Coffin v. United States*.
[162] Brandon Garrett, 'Response: The Myth of the Presumption of Innocence' (2016) 94 Texas Law Review 178, 180, *quoting Missouri v. Frye*, 132 S. Ct. 1399, 1407 (2012); *see also*, Jessica Henry, *Smoke but No Fire, Convicting the Innocent of Crimes That Never Happened* (University of California Press 2020).
[163] Henry, *Smoke but No Fire, Convicting the Innocent of Crimes That Never Happened*.
[164] *United States v. Salerno*, 481 U.S. 739 (1987), 746-747.

and other forms of dismissals. In a more expansive application of the presumption, this use of an acquitted charge would be expressly inappropriate when sentencing a defendant for a wholly distinct crime. Though the conviction acts to stop the application of the presumption as it applies in the courtroom, the use of acquitted charges illustrates the proliferating fascination with criminal records, mug shots, and police radio transmissions in the American justice system.[165] It is similarly the case that because criminal trials are public, the associated records are information which may be publicly published.[166] These examples illustrate the hard stop at the courtroom door for the presumption which similarly does not find support via alternative rights such as privacy or protection of personal data as it does in CoE jurisdictions.

The presumption in the American context is decidedly confined to a procedural role. However the thesis argues that as the use of predictive technologies increase for policing, as well as the acceptance of digital forensics and evidence, notions of fairness must also evolve. Despite the strongest burden set upon the prosecution, unfettered use of sophisticated police technology will unavoidably hinder a fair evidential presentation to the jury by blocking a proper challenge to incriminating evidence by the defendant.

D. Analysis

This chapter has outlined the presumption of innocence as a principle of fairness that is implemented differently in various jurisdictions and at different point in the criminal justice

[165] For more on the allowances made in the sentencing phase in the U.S., specifically the ability of victim advocates to visibly and audibly lobby the judge to choose a harsh sentence in the use of videos, written statements, clothing or posters, or victim impact statements. S. Elizabeth, 'The Newest Spectator Sport: Why Extending Victims Rights to the Spectators' Gallery Eroded the Presumption of Innocence' (2008) 58 *Duke Law Journal* 275. *See also*, Sarah Esther Lageson, *Digital Punishment; Privacy, Stigma, and the Harms of Data-Driven Criminal Justice* (Oxford University Press, 2020).

[166] James B. Jacobs, Mass Incarceration and the Proliferation of Criminal Records, 3 University of Saint Thomas Law Journal (2006) 387, 392-96, 407-410.

process. By demonstrating the different role of the presumption across jurisdictions, the chapter aims to argue that the presumption applies to acts by police and specifically predictive policing, regardless of the contextualization of its use. It has been demonstrated that certain approaches to applying the presumption such as in France, already view policing as critical to future fairness in trial. In others, such as the U.S., procedural aspects are given much greater weight, despite proven effects of policing on the presumption and in contrast, significant lip service to its importance. The principle of preventing crime is not *de facto* contrary to the aims of protecting individual liberties, however when applied to a framework as powerful but also prone to error as predictive policing, its effects must be carefully considered. Therefore the frequently cited balance between protecting the innocent but convicting the guilty endures.

Where an individual may be stopped and questioned or even put into police custody, there is the definitely outward implication that the individual is guilty of some act which meets a police officer's standard for the suspicion of guilt at a minimum. The use of predictive policing widens the group of individuals who may potentially fit a risk profile or may be in the range of a location considered to be prone to crime. This thereby creates a categorical profile for suspects who warrant heightened police attention in the form of what may equate to or become a criminal investigation. This is comparable to the transformation of a suspect into a defendant at the issuance of a charge, but instead turns a citizen into a suspect with the input of data into a risk assessment.[167] The designation of suspect, or 'person of interest' is one that may have tangible effects on an individual's life and therefore the standards of suspicion relevant to the point in the investigatory phase are in effect to protect the innocent. Indeed there are numerous examples across jurisdictions in which the designation of the status 'suspect' has evolved and with it, the

[167] DeAngelis (n 57), 48.

"triggering mechanism" for "related procedural safeguards."[168] Beyond the countless ways in which individuals may be continually punished for having a criminal record is the stigma and social exclusion that arises of this type of labelling.[169] Stigma may be perfectly captured by the use of the terms 'ex-convict' or 'ex-offender.' This form of labelling precludes an individual from being someone other than the person who has committed an offence in the past and is theoretically one who is more likely to reoffend, despite having completed a sentence, or even been acquitted. This arrested legal state of being may be termed an inability to "re-biography."[170] In other words, the effects of policing according to risk may follow an individual through their life.

In the context of predictive policing, this may cut an individual off from the opportunity to be treated as innocent.[171] Legally, the record of police interactions may generate a higher level of future suspicion by police officers when next encountered on the street. Despite limits on data retention, each new stop may beget a new record, carrying the initial interaction into perpetuity. In the case of an acquittal which remains in the record as a basis for future police stops, this use of policing data may run directly afoul of the case law of the ECtHR stating that an acquittal, or other dismissal, prolongs the application of the presumption to an individual for a specific allegation. When a series of events such as this hypothetical occurs in the course of predictive policing, it may be argued that these fact patterns implicate the individual's right to be presumed innocent. Though further expanded readings of applying the presumption may be warranted in

[168] John AE Vervaele, 'Special Procedural Measures and the Protection of Human Rights' (2009) 5 Utrecht Law Review, 108-109.
[169] Wolitz (n 61), 1312.
[170] James B Jacobs, *The Eternal Criminal Record* (Harvard University Press 2015), 114.
[171] Lucia Zedner, 'Seeking Security by Eroding Rights: The Side-Stepping of Due Process', *Security and Human Rights* (Hart Publishing 2007), 271.

ECHR jurisdictions, this use of police data is at a minimum in violation of the presumption as interpreted by the Court and leads to ongoing treatment as guilty.

Formal punishment is generally straight forward and may include methods such as incapacitation, financial or other sanctions, or probationary measures either on movement or professionally, for instance. Informal methods of punishment are much more difficult to quantify, as they extend from state action into society and permeate different areas of social life, generally termed as collateral punishment. Collateral punishment may be state sanctioned and at times so seemingly extreme that it is difficult to consider it informal. In jurisdictions such as the U.S., previous offenders of federal crimes may remain ineligible to vote or run for office, be excluded from public benefits and barred from certain professions. In the U.K., individuals convicted of certain sexual offenses must remain registered with the state and provide regular updates as to any movement outside of the jurisdiction. In the U.S. it is further required in many jurisdictions that individuals inform their neighbors of past convictions of a sexually violent nature.[172] These so-called informal punishments range from invoking stigmatization to limited social mobility, despite their onset following the completion of a sentence.[173] In addition they are frequently cited as violations, or at least gross deviations from the presumption. In the U.K. an increase in the use of preventative orders formalizes this move toward extending or supplanting the role of the criminal court in meting out punishment.[174]

The above examples demonstrate the tension between ensuring security as in the use of pretrial detention or monitoring of offenders of serious crimes. But also in each of the surveyed

[172] Duff (n 3), 13-15.
[173] DeAngelis (n 57), *citing* Joel Feinberg, 'The Expressive Function of Punishment,' *The Monist* 49 (1965): 397-423.
[174] Andrew Ashworth and Lucia Zedner, 'Defending the Criminal Law: Reflections on the Changing Character of Crime, Procedure, and Sanctions' (2008) 2 Criminal Law and Philosophy 21, 35-37.

jurisdictions, the matter of proportionality is also emphasized. Where many of the police practices considered to date by courts may be concrete acts with measurable results, predictive policing does not provide such an easy justification of proportionality. It is therefore proposed that applying the pre-discussed principles and caselaw would find predictive policing in frequent violation of the presumption.

It is further argued here that the act of predictive policing mirrors a criminal investigation much more closely than a police patrol and therefore should be subject to the protection of the presumption afforded subjects of criminal investigations. Criminal investigations, a recognized pretrial process, require that police resources be utilized to determine the perpetrator of a crime which has been committed and catalogued by police. Criminal investigation is a process which is organized and methodical, using all available information.[175] The use of tools that may generate a profile based on factual evidence allow for the targeting of individuals who are in some way connected to the details of a crime.[176] Predictive policing uses a similar method, whereby the evidence and elements of former crimes are used to build the profile of individuals who may be similar to past offenders and therefore potentially likely to commit future crimes.[177]

Whereas earlier forms of sophisticated techniques, or first generation forensic technology, were used to confirm or deny suspicion, the second generation is capable of being used for proactive investigations, perfectly illustrated by risk assessments.[178] The main difference between the two methods is the commission of a crime, a temporal place holder at which a charge may be filed and the pretrial protections are afforded the suspect. In the case of France, where a pre-charge investigation and judicial investigation are distinguished, predictive

[175] Garland [3].
[176] DeAngelis [39].
[177] Marks, Bowling and Keenan [73].
[178] Ibid.

policing does not clearly fit established standards. Without the crime there is no charge and the potential suspect, so treated by police, may not also garner the protections of the legal process. This can similarly be stated in terms of the evidence which generally propels an investigation, which in the proactive sense is missing. Instead, intelligence, or information often not for public consumption, is used to drive anticipatory action.[179] As alluded to above, this has real, detrimental effects on an individuals' rights. It is argued that as action against the individual is increasingly executed in a preventative context, the protections against arbitrary state action should follow accordingly.[180] Therefore the clear distinction between the burdens put upon police to pursue a belief in guilt during the investigative phase and the burden on the state during the adjudicative phase, are blurred by an extension of the investigation into preemption.[181] This will be discussed at greater length in Chapter 4.

However it is not necessary to progress this far into the argument of applying the presumption to policing. Policing requires the level of suspicion necessary to assume that an individual is, was, or will imminently be engaged in a criminal act. The entire criminal process is dedicated to proving that this is indeed true. If proof to the level necessary to meet the burden is not advanced, depending on the point in the process, the burden is not met and the individual is not found to be guilty of the act. Similarly, the collection of evidence, the search and or stop of an individual and eventual arrest are also subject to a burden, albeit a lesser one. It is acknowledged in the body of literature and law that the status of defendant, or he/she who is accused, has more to lose than his/her accuser. Therefore the individual is also afforded rights

[179] Jude McCullogh and Sharon Pickering, 'Pre-Crime and Counter-Terrorism: Imagining Future Crime in the "War on Terror"' (2009) 49 British Journal of Criminology 628, 632.
[180] Lucia Sommerer, 'The Presumption of Innocence's Janus Head in Data-Driven Government' (Emre Bayamlioglu, Irina Baraliuc, Liisa Janssens, Mireille Hildebrandt eds) *Being Profiled* (Amsterdam University Press 2018).
[181] Cyr (n 38), 898.

and guarantees that do not apply to the accuser.[182] It would be an artificial assumption to state that limits on police coercion are not in place to protect the innocent, as well as the rights of the guilty. The thresholds of also suspicion, discussed in the following chapter, are accordingly designed to maintain a burden on police that the requisite level of suspicion has been generated to treat an individual as potentially guilty and indeed safeguard the trial rights of the defendant.[183]

As the suspicion of guilt drives progress in all points of the process, the allocation of resources, the framing of evidence, as well as the theory of the case a defendant must eventually match, is built by the prosecution.[184] As this process progresses, the stakes to the defendant increase, as does the burden of proof which the accuser must overcome. However as policing and consequent evidence may be increasingly built on a foundation of digital processes or machine learning assessments, it may be argued that there is in practice a reversal of burdens at trial, according to which the defendant must prove that his/her standing in some contrived category is innocent.[185] Even in jurisdictions such as the U.S., where policing sits roundly outside trial processes, a focus on digital evidence as an insurmountable challenge to defendants may arrive at the same conclusion; that such an early designation as defendant denies an adequate level of due process in the policing stage by nullifying aspects of the reasonable suspicion standard, without which the presumption is not applied.

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[182] Wilkinson (n 7), 594.
[183] Mireille Hildebrandt, 'Domains of Law: Private, Public, and Criminal Law', *Law for Computer Scientists and Other Folk* (Oxford University Press 2020), 69.
[184] Michael Naughton, 'How the Presumption of Innocence Renders the Innocent Vulnerable to Wrongful Convictions' (2011) 2 Irish Journal of Legal Studies 40, 41-44.
[185] Radina Stoykova, 'Digital Evidence: Unaddressed Threats to Fairness and the Presumption of Innocence' (2021) 42 Computer Law & Security Review, 2-3.

Accepting this, the presumption is not merely a procedural tool, nor an outcome, but instead it is a "burden of process."[186] The process both protects the individual, the legitimacy of punishment and the state, but also the general fairness of the criminal trial.[187] This is not to overstate the presumption as encompassing the full suite of fair trial rights, however it is certainly an important key to the successful implementation of those rights. That is to say that the rights may function well together but once undermined, the full realization of the others may be impossible. Even in the context of the U.S., in which criminal procedure is the place where the presumption starts and ends, it is critical to the other trial guarantees provided criminal defendants. Though individual, fundamental rights in the trial are closely intertwined it is important that they retain their distinct functions, so that the narrow interpretation of one does not circumscribe the effects of the others.[188] Similarly, to constrain the presumption to post-charge or as in the case of the U.S., after the evidence is collected, witnesses questioned, and jury selected, the case against a defendant has already been effectively established, as well as their opportunity for defense.

Finally, important to any legal system and particularly with criminal justice, is the principle of legal certainty. Risk assessments, which are based on prior behaviors neglect this principle, as a punishment already served may act as impetus for future punishment.[189] Legal certainty, or *lex certa*, which requires that individuals must be aware of law and the law made accessible, must also necessarily include certainty of punishment. If the punishment for an offence is clear, and duly served, to be punished or potentially treated differently despite having

[186] Wilkinson (n 7), 591.
[187] Caroline Kemper, 'Kafkaesque AI? Legal Decision-Making in the Era of Machine Learning' (2020) 24 Intellectual Property & Technology Law Journal 251, 270.
[188] Pamela-Jane Schwikkard*, Presumption of Innocence*, (Juta, 1999).
[189] Završnik (n 55), 14.

fulfilled this requirement, it may be asserted that legal certainty is lacking. The principle of the presumption is captured in the concept of legal certainty, by which an individual who is aware of a criminal action may avoid it, but similarly who serves a criminal sanction may be rest assured that he has satisfactorily completed the debt he owes. To allow the cyclical use of records of past crimes, even if duly accounted for, robs punishment of legal certainty and even directly infringes legal certainty against future allegations.

The chapter outlines clear examples of jurisdictions in which the presumption plays an acknowledged role in policing. By accepting its power in the policing stage shields the defendant from compulsory self-incrimination.[190] In the example of the French Criminal Code for instance, it is clear that incriminating facts, deprivations of liberty, or overly harsh treatment in the course of police custody are recognized to have direct ramifications on the trial process as well as well-being of the subject. This is an important step in applying the presumption to policing, and more directly, predictive policing. However to take it a step further, it may also be argued that by making data a central feature of suspicion and building evidence for the case, the role and importance of interrogation and witness statements may be of secondary importance or limited in scope due to a predisposed notion of the case.[191] This may be an important step in progressing the argument that the presumption applies to policing in jurisdictions such as the U.S., where its role is much more narrow. As predictive policing increasingly affects evidence and evidential burdens, it will become indispensable to recognize the importance of police practices in trial outcomes.

[190] Van Sliedregt [15].
[191] Radina Stoykova, 'Digital Evidence: Unaddressed Threats to Fairness and the Presumption of Innocence' (2021) 42 Computer Law & Security Review, 5.

It is nearly impossible to sever the normative implications of the presumption from its wider role in ensuring the fairness of the trial.[192] The question to which the chapter proposes an answer, is at which point an individual becomes a suspect subject to investigation and, what protections apply to this process before he/she formally becomes a defendant.[193] This analysis is already well underway by the ECtHR, which has held out the reputational aspects as affected by policing. The chapter herein argues that the use of a criminal record to assess an individual for future likeliness of criminal behavior is not far from the aforementioned types of collateral consequences, particularly when actionable by police. It is the argument set forth in this chapter that to fail to apply the presumption to predictive policing would risk lessening its value as a "guiding principle" in criminal trials progressing with sophisticated technologies regardless of jurisdiction.[194] As a categorization of 'dangerous' makes one more like a suspect, the legal reading is more likely to be guilty, translated into not innocent. This is problematic as innocence requires an object, as should the label of suspect.

E. Conclusion

In the case of predictive policing, criminal investigations may be initiated with a belief in the likelihood that a future crime will occur based on the fact that a past crime of a particular nature was already committed. The first and clear question should be whether the information on which this assumption is based, is perfect, and whether the 'future' suspect is in fact presently innocent.[195] Predictive technologies have a *de facto* tendency to label individuals as a means of

[192] Weigend [14].
[193] Duff [13] 4.
[194] Sabine Gless, 'Predictive Policing - In Defense of "True Positives"', *Being Profiled: Cogitas Ergo Sum; 10 Years of Profiling the European Citizen* (Amsterdam University Press 2018), 79.
[195] Duff (n 3), 9.

categorizing risks, which guides the ongoing relationship between the individual and state, regardless of the legal label of the individual.[196] Whereas previously an individual was not rendered a suspect until a crime occurred and an investigation ensued, individuals may now be treated as a suspect in advance of a crime. It is an arbitrary application of the presumption to treat some suspects as innocent and not others rendering predictive policing mis-aligned to fair trial standards.[197]

[196] Duff.
[197] Marco Mendola, 'One Step Further in the "Surveillance Society": The Case of Predictive Policing' [2016] Leiden University Tech and Law Center, 10-12.

Chapter 4: Misaligned Thresholds: Triggering Rights and Quantifying Suspicion

A. Introduction

This chapter explores the legal standards that trigger protective rights surrounding the police use of stops and arrests. Namely, it analyzes thresholds relevant to police actions and protections, and the ways in which they may be affected or altered by the use of predictive policing. In so doing, it will propose two arguments. First, it is argued that the effect of predictive policing on reaching the adequate threshold of suspicion necessary in policing is altered due to the use of risk assessments, effectively changing the standard for police intervention, as in the cases of the U.K. and U.S.. Secondly, the chapter posits that the effects of predictive policing often mirror that of criminal investigation, but rarely meet the threshold for fundamental rights protections as explored in the case of the ECHR. The analysis concludes with the submission that in both common and civil law countries, predictive policing acts outside the thresholds traditionally applied to policing, detrimentally allowing police increased power directly inverse to the rights and protections of the policed.

The chapter proceeds by first examining the inextricable processes of applying discretion and forming suspicion, before discussing the ways in which either are altered by the use of risk assessments and predictive policing. It will posit that discretion becomes highly influenced by the methods of prediction such as risk assessment tools, causing suspicion to become what may be categorized as algorithmic, or machine generated. The effect on officer anticipation, discretion, and his/her perception of a given situation, when armed with a predictive analysis, is necessarily altered, that is to say that the officer approaches the situation with a degree of

existing suspicion. Therefore any suspicion formed in the course of an interaction must meet a lower threshold to reach the legal standard and thus the practical meaning of a threshold of suspicion is lessened. This may be additionally problematic in the case of bad or inaccurate data.

This chapter will apply the above analysis to the case of a high crime area as designated by a risk assessment to demonstrate how the relevant threshold of suspicion is altered in common law countries, using the U.S. and U.K. examples. It will explore the exercise of discretion across the varying jurisdictions through an examination of police regulations and case law as generally applied without predictive analyses. The analysis of predictive policing and discretion will be applied to the thresholds of suspicion therein, to determine whether it does indeed operate at a lower standard with predictive policing and whether such an application of suspicion still meets the criteria of police fairness.

The following sub-section will explore the effect of predictive policing on the application of fundamental rights in civil law systems, as in the ECHR countries. The argument will be offered that though predictive policing is distinct from a criminal investigation, there are parallel processes and effects on individuals, pushing criminal law into prevention without expanding individual protections. The chapter will continue to apply the identification of a high crime area in the framework of the threshold of suspicion, in an attempt to demonstrate the practical effects of the practice. Finally, the chapter will explore the effects of algorithmic suspicion in the absence of individual protections on future due process rights of individuals who may become the subject of police scrutiny due to predictive policing.

B. Predictive Policing & Suspicion

1. Discretion and suspicion

Discretion is an invaluable part of policing in common law and civil law systems and informs broad areas of police activity. Indeed the exercise of discretion is critical to timely and effective policing, as decisions over whether and how to pursue, stop, arrest, investigate and prosecute are critical components of crime control whether investigations are led by prosecutors, judges, or police officers. Whereas common law policing involves a blend of autonomously driven crime prevention and control, the principle of legality in civil law countries furcates these tasks.[1] In the case of a crime, civil law generally dictates that a prosecutor may with police assistance, initiate an investigation, whereas in common law systems, police may autonomously begin an investigation at the discovery of a crime. With predictive policing, there is no crime to set a temporal marker for investigation, nor a crime to investigate. Therefore police intervention is appropriate according to a lower standard, herein suspicion.

As discussed in Chapter 2, the effect of predictive policing is particularly noticeable in the practice of discretion, where the competencies of patrol and investigation are inherently blurred and the use of data becomes uniform across competences. Discretion is defined as a form of efficiency, entrusted to officers as a result of proper training and lived experience.[2] The police officer as a "street-level bureau[crat]" cannot be trained in advance of every iteration of a situation and therefore must be able to act according to his/her informed judgment.[3] Discretion may therefore manifest as the decision that action is inappropriate or inadvisable for any variety

[1] Simon Bronitt and Philip Tenning, 'Understanding Discretion in Modern Policing' (2011) 35 Criminal Law Journal 319, 320-321.
[2] Tilley, "Modern Approaches to Policing: Community, Problem-Oriented and Intelligence-Led."
[3] Georgina Ibarra, David Douglas and Meena Tharmarajah, 'Machine Learning and Responsibility in Criminal Investigation' (CSIRO 2020) EP205485, 18.

of reasons. In the scenario in which an officer observes someone acting erratically in a public place, he/she must determine whether this is indeed erratic according to context; whether this suggests illegal behavior; whether it poses a risk to himself and/or others; whether it is appropriate for the officer to intervene; according to which grounds the officer may intervene; whether it is safe for the officer to intervene; what applicable laws or regulations may be relevant, *et cetera*. It is clearly necessary that an officer has the ability to make these decisions instantaneously without adhering to inflexible standards which may not meet the reality of the circumstances.[4] Police are similarly given the ability to use coercive measures when necessary within a system of police standards and principles. In order for him/her to determine the situations in which coercion is necessary or appropriate, he/she must be able to act in the moment without stopping to consult the relevant guidelines or the competent legal advisor. The ability to quickly and concisely assess a situation is one of the largest responsibilities and skills present in police officers' tool kit and critical to effective crime control. Discretion must therefore be rooted in sound judgment, as a basis for articulable decision-making.[5]

Though an officer may be aware of the relevant laws implicated by an observation, or the reputation that may apply to the area in which he/she is present, these are useless bits of information without the ability to synthesize this knowledge with observations as they occur in context. Discretion as formed at the scene will inherently include any prior knowledge or preconceived notions. Here the use of risk assessments obviously affects discretion. As discussed, a risk assessment provides advance information on a situation, before the officer steps into the context. It may be claimed that using risk assessments provide enhanced knowledge of

[4] Elizabeth Joh, 'Feeding the Machine: Policing, Crime Data & Algorithms' (2017) 26 William & Mary Bill of Rights Journal 287, 297.
[5] Elizabeth Joh, 'Policing by Numbers: Big Data and the Fourth Amendment' (2014) 89 Washington Law Review 35, 58-59.

any given situation as may be encountered by police. And indeed because predictive policing is not intended to be automated decision-making, it provides only one component of the available knowledge applied to real-time observation.[6] Granted, the more information an officer possesses, the better he/she should be able to do their job. However in the case of the risk assessment, the officer must know with what weight to apply the output of the risk assessment and how far it should be applied to a situation, given its limitations or other unknowns.

The use of discretion is very closely tied to a situation in context, and though historical data may accurately relay historical details, to apply them without regard for context risks mis-application of the utilized data. Risk assessments are developed to efficiently sort data in a statistical manner totally removed from the real world of social processes and therefore portable between contexts. It may then be said that predictive policing programs are modular, in that they are practically isolated in function.[7] An officer is then exercising discretion with 'knowledge' that was formed out of context, so much so that it does not adapt to the situation in which it is applied. Discretion is therefore altered by allowing machine based predictions to suggest a blind interpretation of a situation, influencing officer perceptions according to their 'enhanced' understanding of the observations at hand.[8] Interestingly, the bifurcated approach taken by a mechanized prediction therefore also mirrors the distinction between police implementing predictive policing and those exercising discretion in the field. Police discretion is most frequently exercised by officers in the lowest ranks who interact most often with citizens; however the officers responsible for the implementation of risk assessments and even likely

[6] Nick Lally, '"It Makes Almost No Difference Which Algorithm You Use": On the Modularity of Predictive Policing' [2021] Urban Geography, 5.
[7] Id.
[8] Sun-Ha Hong, "Prediction as Extraction of Discretion," 2022 ACM Conference on Fairness, Accountability, and Transparency, June 2022.

responsible for their use and related oversight use less discretion in their own work.[9] This all together illustrates the assertion that though enhanced police information may advance a collective benefit, its abstract nature does not align to its use by police when used to inform discretion. Therefore even if risk assessment outputs are minimally observed, they may still play an outsized role in the actual exercise of discretion.

The knowledge of local context informs the officer's use of discretion and guards against a 'fragmentation of information.'[10] If an officer is directed to a location based on a prediction that individuals are more likely to carry weapons there, rather than temper his/her observations with contextual knowledge, the wearing of bulky clothes by anyone in the area may be considered as suspicious before the officer even actually encounters such a person. However this may be normal behavior for an individual leaving his/her shift at the ice rink a block away. With the officer's real-time discretion so altered, the situation may be perceived differently from what it actually is. Here it is clear to see the role that discretion plays in the context of a police patrol. Even if the officer is aware of the nearby ice rink, the wearing of bulky clothes makes all patrons or employees automatically a degree of suspicious more than others. The subsequent actions to meet a threshold of suspicion are necessarily lowered. Herein lies the crux of the relationship between suspicion and discretion.

Discretion is also extremely critical to the formation of suspicion. Suspicion comes from the perception of a situation, based on facts and resulting inferences and is used to gauge the appropriateness of police intervention. Suspicion is inherently difficult to quantify and though should be articulable, cannot be parsed into readily discrete, requisite factors. As will be

[9] Paul Quinton, Nick Bland and Joel Miller, 'Police Stops, Decision-Making and Practice' (U.K. Home Office 2000) 130, 15.
[10] Grace, "Human Rights, Regulation and the Development of Algorithmic Police Intelligence Analysis Tools in the UK."

discussed in more detail below, suspicion provides a check on certain police activities, ensuring that individual liberties are not arbitrarily disturbed.

In addition to the fragmentation of knowledge referenced above, the process of the risk assessment is very linear in nature: by detecting a crime pattern over time (using past data), officers may determine the form that a similar, future crime may take. That is, because according to the finding of the risk assessment, it is 'recommended' to expect that the trend will continue and follow it accordingly.[11] However human decision making is not subject to the same context-less, linear process through which the risk assessment functions, not to mention human autonomy. Indeed most behaviors are not reducible to a numeric, probabilistic calculation and this embodies the notion of discretion which relies on a degree of intellect and inductive reasoning as illustrated in the example above.[12] The distinction between statistical analysis and individual discretion may be termed as "mechanical prediction" versus "clinical judgment."[13] Similarly, in the exercise of their discretion officers also rely upon what is called an inference to the best explanation."[14] This is to say that despite a statistical likelihood that one may be guilty, by adjudging the evidence and information available, statistical recommendations are relevant only insofar as it offers a plausible conclusion. Forming suspicion requires a combination of facts as observed, tempered by reason, and applied to the law. A purely statistical approach to suspicion cannot truly meet the standards of discretion necessary in policing.[15] Therefore to rely on a risk assessment to provide any degree of influence on discretion, albeit not even the guiding influence, but the starting point, risks misconstruing all that follows.

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[11] Helene Gundhus, Niri Talberg, and Christin Wathne, "From Discretion to Standardization: Digitalization of the Police Organization," *International Journal of Police Science & Management*, 2021, 1–15.
[12] Goldberg (n 1), 14.
[13] Ric Simmons, 'Quantifying Criminal Procedure: How to Unlock the Potential of Big Data in Our Criminal Justice System' [2016] Michigan State Law Review 947, 952.
[14] Emily Berman, "Individualized Suspicion," *Iowa Law Review* 105 (2020): 463–506.
[15] ibid, 494-5.

In addition to present context, a human officer should consider the causal sequence of consequences of a particular decision beyond the immediacy of the action itself.[16] The risk assessment does not retain this ability to consider iterations of a decision, that is to say, it lacks discretion. It may only predict the future abstractly while assessing the past linearly; in other words, AI acts with bounded rationality.[17] The knowledge of a trend and its accordant details is important to an officer, but the officer can see crime as a multi-dimensional event, rather than from a strictly binary, data-centric perspective.[18] Algorithmic suspicion is a non-human application of facts to human-derived legal standards which cause real, human collateral consequences.[19] Similarly, just as police and crime records are often incomplete or inaccurate, so too are the probabilistic correlations that are taken as the result of risk assessments. Therefore as risk assessments produce relative possibilities, in the case that correlations are missing information, the 'most probable' likely criminal act is only the most probable with the information available, not necessarily in truth.[20] In the case of a human officer on the ground, the use of discretion and deductive reasoning may allow for informed 'filling in' of the blanks.[21] The shortcomings in relying upon a two dimensional output to guide discretion clearly raises challenge to the role of risk assessments in building suspicion.

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[16] 'Report on Algorithmic Risk Assessment Tools in the U.S. Criminal Justice System' (Partnership on AI 2019), 22 <https://partnershiponai.org/paper/report-on-machine-learning-in-risk-assessment-tools-in-the-u-s-criminal-justice-system/>.

[17] Independent High-level Expert Group on Artificial Intelligence, 'A Definition of AI: Main Capabilities and Disciplines' (European Commission 2019), 3.

[18] Helene Gundhus, Niri Talberg and Christin Wathne, 'From Discretion to Standardization: Digitalization of the Police Organization' [2021] International Journal of Police Science & Management 1, 8.

[19] James Johnson, "Delegating Strategic Decision-Making to Machines: Dr. Strangelove Redux?," *Journal of Strategic Studies*, 2020.

[20] Mohammad A Tayebi and Uwe Glässer, 'Social Network Analysis in Predictive Policing' in Mohammad A Tayebi and Uwe Glässer (eds), *Social Network Analysis in Predictive Policing: Concepts, Models and Methods* (Springer International Publishing 2016) <https://doi.org/10.1007/978-3-319-41492-8_2> accessed 9 January 2020, 64.

[21] Ira Flatow, "How Imperfect Data Leads Us Astray with Kasia Chmielinski," *Science Friday*, accessed August 19, 2021, <https://www.sciencefriday.com/segments/imperfect-data/#segment-transcript>.

2. Machine generated suspicion versus manual suspicion

The result of discretion driven, or at least influenced by risk assessment, may result in a move toward policing that more closely resembles a dragnet than suspicion of an observable individual's behavior. The focus of suspicion lies with the potential offender, which prior to the commission of a crime, could be anyone. From this baseline, any individual fitting correlated bits of a profile derived of historical data is more suspicious than others even before being observed by an officer.[22] This results in a lack of individualization and detracts from the exercise of discretion. As a result, the threshold of suspicion necessary for that individual is lowered in practice against those who did not match the automated profile regardless of his/her actions.[23] For instance if a risk assessment indicates that a certain aged man in a particular neighborhood at a given time indicates a higher risk of committing a crime than others, the threshold of suspicious behavior necessary by the man to warrant police scrutiny is much lower than for others. As discussed in Chapter 5, this relegates all men of a particular age in a set location to a profile group.

Some scholars have argued that the only difference between a categorical (as applied to automated predictions herein) suspicion and human-derived, individualized suspicion is the quantitative nature of the automated risk assessment. This argument follows that the same types of data used by the risk assessment are similarly applied by the human officer, such as neighborhood history of crime.[24] Indeed, in the absence of witnessing a crime in progress an officer's educated expectations and deductive reasoning applied to a given situation remains a

[22] Sarah Brayne, 'Dye in the Cracks: The Limits of Legal Frameworks Governing Police Use of Big Data' (2021) 65 Saint Louis University Law Journal 823, 829.
[23] Tyler (n 12), 597.
[24] Christopher Slobogin, 'Policing and The Cloud' (National Constitution Center), 8.

probabilistic assessment.[25] While there is general truth to arguments of practical equivalency, they however miss the mark by undervaluing the power of automation and the quantity and substance of data involved. Data used to make predictive assessments is comprised of myriad categories of information that may be based upon historical facts that are either static (correct but no longer applicable) or outright false.[26] Another difference notable in categorical suspicion is the linking of 'innocent' data with data actually relevant to criminal behavior.[27] A patrol officer does not need knowledge of an individual's school or family history when encountered on the street. However the use of a risk assessment allows a case to be built, in which the individual may be retrofitted to a crime when it actually may occur. This is to say that the case algorithmically built may be applied after the fact to justify an officer's suspicion, despite no real relevance at the time of interaction. This categorical suspicion may be described as 'programmatic policing' whereby the population is algorithmically filtered for police identification of suspicious individuals, whereas previously 'transactional policing' centered on an interaction between individuals (citizen and officer).[28]

This sub-section has assessed the importance of discretion in policing and its role in forming suspicion. It has been posited that a risk assessment will in some way affect discretion by altered pre-knowledge or expectations of a situation, therefore changing the interpretation of what may be considered suspicious. It finally compared the use of automated suspicion to a dragnet, in which individuals are replaced as composite predictive profiles.

[25] Brayne (n 23), 830.
[26] Renee Jorgensen, 'Algorithms and the Individual in Criminal Law' [2021] Canadian Journal of Philosophy 1, 4.
[27] Elizabeth Joh, 'The New Surveillance Discretion: Automated Suspicion, Big Data, and Policing' (2016) 10 Harvard Law & Policy Review 15, 27.
[28] Hannah Bloch-Wehba, 'Visible Policing' (2021) 109 California Law Review 917, 949.

C. Thresholds and legal protections

This section will analyze the mis-match of thresholds across jurisdictions and the way in which predictive policing has stretched the beginning point of the criminal process, affecting both fundamental rights and police standards. In Council of Europe countries, it will be shown that though the criminal investigation triggers the applicability of rights set forth for criminal suspects and defendants, this poses a problematic starting point for a subject of predictive policing against whom no charges have been levied. Similarly, in the United States it will be shown that the standard of reasonable no longer resembles the reasonable suspicion standard originally envisaged, just as in the United Kingdom the definitions of suspicionless and for cause stops has blurred. As a result, the use of predictive policing sits problematically outside the reach of fundamental rights and due process alike.

1. Council of Europe

This sub-section will address the fundamental rights set forth in the ECHR as applied to criminal suspects and defendants. It will be argued that the threshold for an individual to raise a claim of violation is cut off by the threshold point as interpreted by the Court, specifically as relates to Article 5 and Article 8. Just as the previous chapter discussed the application of the presumption of innocence to predictive policing and the necessity for recognizing the potential criminal justice harms of expanded prevention, this sub-section will address the applicability to the right of liberty and security when policing sits outside the formal criminal justice process.

Though at times the ECtHR has treated state surveillance generally, allowing for select *in abstracto* claims where otherwise inadmissible, the ECtHR generally turns on the assumption that the applicant may be identified: either as a natural person or group, and that the applicant

was the victim of a violation.[29] As established, predictive policing is the origin point of real violations of fundamental rights with criminal law consequences, such as a criminal record, stigmatization, collateral forms of punishment and a general intrusion onto one's dignity. At the point of predictive analysis there is generally no Art. 5 or 6 claim to make under current interpretations of the ECHR, despite the virtually identical collateral effects to that of arrest or detention.[30]

In defining liberty, the Court has determined that it refers to the fact that any intrusion on the physical liberty of an individual beyond that of a mere restriction, such as arrest or detention, must not be arbitrary.[31] Liberty is further clarified by the Court in a similar but distinct manner apart from the freedom of movement.[32] The Court distinguishes between a deprivation of liberty, which requires a higher threshold infringement, versus a restriction on liberty which may also be referred to as a restriction on movement and does not need to meet as high a standard of justification.[33] It has made clear that though a restriction on movement may at some point reach the level of a deprivation of liberty, on its face, these are separate rights which are treated as such and are guarded by different standards (Art. 2, Protocol IV; Art. 5, respectively).[34]

Though the Court has not comprehensively set forth all actions which will constitute a deprivation of liberty, it has clarified several points which will not serve as definitive indicators of deprivation in isolation. Generally an assessment of deprivation relies on the 'degree of

[29] Eleni Kosta, "Algorithmic State Surveillance: Challenging the Notion of Agency in Human Rights," *Regulation & Governance*, 2020.
[30] In *Klass v. Germany*, the Court found that the existence of a regulation governing secret surveillance indicates its existence and potential application to an applicant.
[31] Schabas, *The European Convention on Human Rights: A Commentary*.
[32] Id.
[33] *See, De Tommaso v. Italy*, No. 399/02 (13 November 2007), Para 80.
[34] Richard Edwards, 'Police Powers and Article 5 ECHR: Time for a New Approach to the Interpretation of the Right to Liberty' (2020) 41 Liverpool Law Review 331, 336.

intensity' of the act, rather than the nature or substance.[35] Relevant factors to be considered include the type, duration, manner, and consequences of the measure, all taken together to assess their cumulative effect.[36] Though a coercive act by police or the inability for an individual to physically leave his/her space of detention often indicates a deprivation of liberty, the fact that no coercive measures were used, such as physical restraints, does not indicate that a stop or detention was not a deprivation.[37] Similarly, nor is the purpose or length of the measure in question necessarily determinative of whether there was a deprivation.[38] It may therefore be posited that the determination of a deprivation of liberty may be assessed from both an objective and subjective standard, adjudged in its totality. The objective nature of an act includes the aspects referenced above: the ability to leave detention, control or supervision over the subject, and the availability (or lack thereof) of outside contacts.[39] Subjectively, the main factor to consider is whether the individual consented to the detention, e.g., whether custody was against the will of the subject individual.[40]

The critical distinction between deprivation of liberty and restriction on the freedom of movement is frequently a source of dispute raised to the Court, as no clear bright line rule can be discerned but only a factually-based analysis in which the "concrete situation" will guide the

[35] Rohaida Nordin and Shajeda Akther, 'Rights Guaranteed under the ECHR for the Protection of Persons Deprived of Their Liberty at Pre-Trial Stage' [2015] The Law Review 80, 82-83.
[36] *Guzzardi v. Italy*, App. No. 7367/76, 1980. Para 92.
[37] *Krupko and Others v. Russia*, No. App. 26587/07 (26 June 2014). Para. 36; *Brega and Others v. Moldova*, App. No. 61485/08 (24 January 2012). Para 43.
[38] *See, Rozhkov v. Russia* (no. 2), App. No. 38898/04 (31 January 2017). Para 74.
[39] *See, Case of Gillan and Quinton v. The United Kingdom*, App. no. 4158/05 (28 June 2005).
[40] William Schabas, *The European Convention on Human Rights: A Commentary* (Oxford University Press 2015), 226-227. Generally the Court holds that the consent, or voluntariness, to a detention negate the accusation of deprivation. In the *Case of Storck v. Germany*, the Court held that " a person can only be considered to have been deprived of his liberty if… he has not validly consented to the confinement in question." *Case of Storck v. Germany*, App. no. 61603/00 (16 June 2005) Para. 74.

relative ambit of the protection.[41] In ensuring that a deprivation of liberty is lawful, the Court is taking a holistic approach to ensuring that the "security of the person" is protected.[42]

In the case of predictive policing, as has been discussed at length, groups and neighborhoods may become the subject of increased police surveillance, due to a predictive analysis indicating that they are at a higher risk for perpetrating, becoming the victim of, or the scene of a crime. Though this does not necessarily mean that any individual in this area will be stopped or arrested, it makes it more likely that this group will become the target of increased police scrutiny, which inherently means a disproportionately higher rate of arrests. In addition, the collateral consequences as listed in the foregoing will affect these individuals and groups disproportionately. Therefore applying the Art. 5 analysis to predictive policing in cases in which nothing beyond surveillance or a brief stop occur, there is no claim to make as to a deprivation of liberty. As discussed as regards the presumption of innocence and the potential for discriminatory policing, there is little available recourse readily available to individuals, as there is no violation on which to make a claim. For this reason it is necessary that predictive policing be defined so as to fit under the auspices of threats to liberty, or for the right to be expanded in interpretation.

Alternatively, were a stop to occur, predicated on the use of predictive policing, a violation of Art. 8 arises in the absence of reasonable suspicion according to the following reasoning and precedents. First, the Court has held that to meet the threshold for suspicion, it must exceed the level of a "genuine and bona fide" suspicion, indicating essentially that while a suspicion must be indeed genuine, this alone is not sufficient grounds for acting upon it. [43] The

[41] *Case of Gillan and Quinton v. The United Kingdom*, App. No. 4158/05 (June 28, 2010).
[42] *Bozano v. France*, App. No. 9990/82, December 18, 1986. Para 54, 60.
[43] *Fox, Campbell and Hartley v. The United Kingdom*, App. No.s 12244/86; 12245/86; 12383/86 (August 30, 1990). Para 32.

threshold requires that a reasonable suspicion "presupposes the existence of facts or information which would satisfy an objective observer...", which are articulable at the time of the determination,[44] and formed in reliance and consideration of all circumstances surrounding the act in question.[45] Therefore observations and inferences which are based in cumulative, known facts may contribute to the degree of reasonableness.[46] Suspicion may also legitimize a brief deprivation of liberty effectuated for the purpose of furthering an investigation or to acquire specific knowledge from a subject, as well as for the collection of fingerprints or biometric data.[47] It may also be legitimate to detain an individual for the purposes of bringing the subject in front of a competent legal authority. In such a situation, a police officer is considered a competent legal authority who as an investigating officer is authorized by law to order the release of a determined subject.[48] Conversely, to continue the detention of an individual, the reasonable suspicion must be ongoing and justified.[49]

Article 8(1) states that "there shall be no interference by a public authority with the exercise of this right except such as is in accordance with the law and is necessary…for the prevention of disorder or crime…"[50] The Court has held the act of indiscriminately stopping individuals in a public place is not in accordance with law and there is a violation of Article 8.[51] 'In accordance with law' may also be defined as foreseeability. The Court has held sufficiently foreseeable to include that an individual must not be completely certain of the effects of a

[44] Case of Urtans v. Lativa, no. 16858/11 (28 October 2014).
[45] Id.
[46] Schabas (n 22), 238.
[47] 'Human Rights and New Technologies in Policing: Issues Paper for the Independent Advisory Group on Emerging Technologies in Policing' (Scottish Human Rights Commission 2021), 21.
[48] *See, Ireland v. the United Kingdom*, App. no. 5310/71 (18 January 1978), Para. 199-200.
[49] *Case of Moldoveanu v. The Republic of Moldova*, no. 53660/15 (14 September 2021)
[50] ECHR Art. 8(1).
[51] *Gillan and Quinton v. United Kingdom*, no. 4158/05 (2010) para 61; *see also M.M. v. the Netherlands*, para 46, holding that non-accordance with the law is sufficient for a finding of a violation of Article 8, it is not necessary to further the analysis to whether it is necessary.

particular law, but it be reasonably foreseeable that an application of a law apply to them in specific circumstances.[52] This has been regarded in varying ways in the context of surveillance, however as policing sits outside national security, this thesis will not address surveillance *per se*. However in the case of policing, inclusion in a specific database which is not known or accessible to the public, for the monitoring of specific behaviors or individuals based on group membership has been held as an unlawful interference into private and family life.[53]

Looking to the second limb of the right, an interference must also be subject to "adequate" safeguards under domestic law. Without valid restrictions or review of enhanced control measures, it has been found that domestic law safeguards may be inadequate and constitute an arbitrary interference with the Art. 8 right.[54] The factors which may be used by the Court in assessing safeguards include, 1) geographic and temporal scope for the authority; 2) discretion as to the authority's use of the relative power; 3) degree of interference; and 4) oversight.[55] It is therefore the positive obligation of the state to ensure that adequate safeguards and checks are in place within domestic law, without which such measures may amount to an Art. 8 violation.

As officers are required to identify articulable factors, based on real-time observations which would satisfy an objective observer as to the level of suspicion, the use of a risk assessment will likely obscure the relationship between context and prior known information. Even if data are purportedly objective, the use of discretion by an officer who has considered the output of a risk to anticipate a situation in advance potentially nullifies objectivity and an appropriate analysis of the total circumstances. To the degree that a risk assessment may provide

[52] *Slivenko v. Latvia*, no. 48321/99, (9 October 2003).
[53] *Shimovolos v. Russia*, no. 30194/09, (2011), para 66.
[54] *Vig v. Hungary*, no. 59648/13, 2021.
[55] *Beghal v. the United Kingdom*, no. 4755/16 (2019).

a high probability for a specific category of crime, the lack of specificity as to any additional details of the crime makes it unlikely that a specific offense may meaningfully be identified.[56] Without specificity predictive policing acts more as a blanket protection against crime, prohibited as a justification for a brief deprivation of liberty without further justification.[57] Finally, the requirement that a 'specific offense' be identified with enough certainty that it is necessary to intervene is unlikely to be met. By default a general threat of harm cannot meet the requirement of necessity, as it is nearly impossible to know what is a necessary response without a specified harm threatened, nor can a threat be perceived of as imminent if unidentifiable in the first place.

However even the adequate level of suspicion will not necessarily legitimate the use of predictive policing powers to affect a stop. It is herein argued that stops in the course of predictive policing are not adequately foreseeable, as the use of databases to aid the formation of suspicion is based in unseen information, much of which is utilized unknown to the subject. In the case of place-based predictive policing it is nearly impossible for an individual to understand the degree of information being used to compile a risk assessment and how it may affect any one person at a given time. Similarly, as this thesis aims to demonstrate, the existing uses of predictive policing are largely executed with a lack of safeguards and with little direct recourse to an individual.

According to the foregoing analysis, the use of predictive policing causes individual harm by circumventing the protection of the Art. 5 right to liberty; and/or violating the right to private life, depending on the policing action taken. Therefore, as will be discussed in the following

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[56] Infra Note 25.

[57] *Jecius v. Lithuania*, App. No. 34578/97 (31 July 2000). Para. 50-52; also Schabas, *The European Convention on Human Rights: A Commentary*; Arkadiusz Lach, "Preventive Arrest in Criminal Procedure and Police Law in Light of Article 5 of the ECHR," *Revista Brasileira de Direito Processual Penal* 7, no. 3 (2021): 1597–1630..

jurisdictions, the traditional thresholds for police action are not appropriate or adequate to the use of predictive policing.

2. United States

In the United States the threshold of suspicion necessary to stop, search, question, or arrest an individual is a "reasonable" level of suspicion. The standard of reasonable suspicion as applied in the United States has its basis in the Fourth Amendment to the Constitution and is defined according to caselaw of the Supreme Court. Findings of police misconduct specifically unreasonable stops, are generally determined by courts and applied as standard setting precedent. However unlike in European jurisdictions, the matter of privacy as relates to surveillance and policing hinges not on the use of data, but distinguishes public from private to determine the bounds of legitimate behavior.[58] The Fourth Amendment also acts as the main source of individual privacy against the state, providing that,

> "The right of the people to be secure in their persons, houses, papers, and effects, against unreasonable searches and seizures, shall not be violated, and no Warrants shall issue, but upon probable cause..."[59]

The threshold of reasonable is one that is considered the standard for an exception of probable cause and allows for searches without a warrant. It should also be noted that for the purpose of the Fourth Amendment, a 'search' may also be defined as interrogation. [60] As in the caselaw of the ECtHR above, the Court also distinguishes what is a "brief investigatory stop" of an individual and the situations in which it is permissible.[61]

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[58] Joh (n 8), 63.
[59] Fourth Amendment to the United States Constitution.
[60] Wilkinson (n 1), 602.
[61] Margo McGehee, "Predictive Policing Technology: Fourth Amendment and Public Policy Concerns," *University of Cincinnati Law Review*, February 17, 2021, https://uclawreview.org/2021/02/17/predictive-policing-technology-fourth-amendment-and-public-policy-concerns/.

Like any other area of law affected by technology, interpreting the Fourth Amendment requires careful attention to how "reasonable" applies to a given situation. Indeed, a literal reading of "houses, papers, and effects" would cover very few subjects of modern searches and seizures. Where 'person' refers to the corporal aspect of an individual, his/her essence is now extended into his/her data kept in any number of devices, such as a smart phone, tablet, or watch.[62] Similarly, our houses are no longer simple, wooden structures, but rather networked via smart alarms, appliances, and monitoring features that contain more personal information on an individual than may be privy to family members.[63] The Amendment may be read as a protection against a physical search, rather than the four dimensional, digital world in which we now live,[64] however due process in any real sense must supersede an analog interpretation and be extended to capture the essence of the protection provided therein.[65] Courts generally weigh the intrusiveness of a stop against the officer's belief in a criminal occurrence and the gravity of the alleged act in order to determine reasonability. This judicial approach is seemingly flexible enough to stand the fluctuations caused by technology, yet also ties the appropriate use of discretion to commonly accepted interpretations of due process.

There is a deep trove of caselaw on the application of the Fourth Amendment as to what is considered "unreasonable," as well as the contours of requirements for a warrant and even situations in which a warrantless search is appropriate. The Supreme Court offers two categories of search which may be considered acceptable exceptions to the probable cause requirement for a warrant. The first form of allowable derogation from the probable cause standard is according to

[62] Andrew Ferguson, "Structural Sensor Surveillance," *Iowa Law Review* 106 (2020): 47–112.
[63] Ferguson (n 3), 27.
[64] Joh, 'The New Surveillance Discretion: Automated Suspicion, Big Data, and Policing' (n 30), 38.
[65] National Academies of Sciences, Engineering, and Medicine, *Proactive Policing: Effects on Crime and Communities* (The National Academies Press 2018), 86.

the 'exigent circumstances doctrine.' The second and the category more likely to be applicable in the case of predictive policing is the 'Terry stop.'[66]

The exigent circumstances doctrine lowers the standard of proof necessary in order to make a warrantless search in a situation in which an officer may believe to observe an ongoing emergency likely to cause imminent harm to an individual, or the apparent potential for destruction of evidence.[67] This exception is generally applied to the search of a property but may also sometimes be applied to the suspicionless search of an individual in the immediate aftermath of a crime, when the search is tailored to a narrowly defined crime and geographic area.[68] Police are required to determine exigency based on the totality of the circumstances, according to his/her knowledge of the circumstances at that time.[69] In a situation in which police action causes apparent exigency, this alone is generally not sufficient to carry out a warrantless search.[70]

The Supreme Court tested the validity of a high crime designation as the basis for the suspicionless stop according to the exigent circumstances doctrine in *United States v. Curry*.[71] In the instant case police officers were responding to a call reporting gunshots at an apartment complex and in the course of assessing the scene encountered several men, including the appellant, in the vicinity of the subject building.[72] Upon encountering the men the police stopped and searched the appellant and finding a firearm on his person, arrested him on suspicion of being involved with the shooting. The lower court found the police to be acting in response to exigent circumstances and upheld the search and subsequent arrest despite the absence of

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[66] McGehee, "Predictive Policing Technology: Fourth Amendment and Public Policy Concerns."
[67] *Carpenter v. United States*, 138 S. Ct. 2206 (2018) at 2223.
[68] *United States v. Curry*, 965 F.3d 313 (4th Cir. 2020).
[69] *Hopkins v. Bonvicino*, 573 F.3d 752, 763 (9th Cir. 2009) at 535, *quoting United States v. Licata*, 761 F.2d 537, 543 (9th Cir. 1985).
[70] *See United States v. Arvizu*, 534 U.S. 266, 273 (2002), *quoting United States v. Cortez*, 449 U.S. 411, 417-18 (1981); *also United States v. Lundin*, 817 F.3d 1151, 1158 (9th Cir. 2016).
[71] *United States v. Curry*, 965 F.3d 313 (4th Cir. 2020).
[72] *United States v. Curry*, 965 F.3d 313 (4th Cir. 2020).

probable cause. However on reaching the Supreme Court, it held that the exigent circumstances doctrine was applied to this case in error, as it is not appropriate basis for the indiscriminate, investigatory stop of an individual without narrowly defined parameters, but rather due to the location of the individuals.[73]

In finding the stop unlawful, the Court indicated that exigent circumstances include, "the need to pursue a fleeing suspect, protect individuals who are threatened with imminent harm, or prevent the imminent destruction of evidence."[74] Because the appellant was neither acting suspiciously or threateningly nor fleeing or destroying evidence, the Court held the stop to be inappropriate. In other words, short of an emergency or clear indication that the individual was involved with the commission of a crime, reasonable suspicion was still required to make the stop and search of the appellant in the given circumstances. Therefore if applied to predictive policing, the threshold of suspicion necessary for searching an individual due to a 'suspicious' location, would not be met.

However the more applicable exception to warrant requirement is the so-called Terry stop. A feature of police patrol, this stop is used by an officer who observes behavior that with a level of reasonable suspicion, may be relevant to an ongoing or imminent crime. So called for its namesake, *Terry v. United States*[75] involved an officer who observed what he believed to be behavior indicating that Terry and his companion may be planning a burglary. On this suspicion, the officer stopped them to question the motivation for their actions and in the course of the conversation he observed what he believed to be a handgun in Terry's jacket. Upon searching the men, police discovered that both carried a weapon. The men challenged the searches as

[73] Erwin Chemerinsky, "Chemerinsky: Supreme Court Looks to Common Law for Guidance in Fourth Amendment Cases," *ABA Journal*, July 6, 2021, https://www.abajournal.com/authors/9822/.
[74] *United States v. Curry*, *citing Carpenter*, 138 S. Ct. at 2223.
[75] *Terry v. Ohio*, 392 U.S. 1 (1968).

unreasonable and claimed the weapons were inadmissible as evidence. Following appeal, the Supreme Court ultimately held that,

> "…we consider first the nature and extent of the governmental interests involved. One general interest is of course that of effective crime prevention and detection; it is this interest which underlies the recognition that a police officer may in appropriate circumstances and in an appropriate manner approach a person for purposes of investigating possibly criminal behavior even though ….We merely hold today that where a police officer observes unusual conduct which leads him reasonably to conclude in light of his experience that criminal activity may be afoot and that the persons with whom he is dealing may be armed and presently dangerous…he is entitled for the protection of himself and others in the area to conduct a carefully limited search …"[76]

Terry provided a legal framework for stop and frisk; the stop being the precursor and opening for forming a reason for frisk (search). The stop is lawful if based on a properly formed reasonable suspicion and because it may often be the pretext for identifying a basis for probable cause (for an arrest or search), it may be called an 'investigative stop' or 'pretextual' stop.[77]

The Court established that the threshold of reasonable suspicion is met when "the totality of the circumstances lead the officer to believe criminal activity is afoot."[78] Totality is defined as the specific and articulable, particularized facts, which with rational inferences applied to the context, lead "an objectively reasonable officer" to believe the intrusion is warranted.[79] The suspicion must be derived of an objective basis, rather than a hunch.[80] Totality then requires an assessment of the individual's behavior based within the context of time and place, as well as well as what else may be occurring at that time.[81] In instances in which an officer's observations could not reasonably warrant the conclusion used to justify a stop, the Court has held that the

[76] *Terry v. Ohio*, 392 U.S. 1 (1968).
[77] McGehee, "Predictive Policing Technology: Fourth Amendment and Public Policy Concerns."
[78] *Terry v. Ohio*, 392 U.S. 1 (1968).
[79] *United States v. Kehoe*, 893 F.3d 232 (4th Cir. 2018).
[80] *United States v. Kehoe*, 893 F.3d 232 (4th Cir. 2018), *quoting United States v. Sokolow*, 490 U.S. 1, 7 (1989).
[81] Kelly Koss, 'Leveraging Predictive Policing Algorithms to Restore Fourth Amendment Protections in High-Crime Areas in a Post-Wardlow World' (2015) 90 Chicago-Kent Law Review 301, 314-315, *citing Terry* at 30.

standard has not been met.[82] As has been discussed, the risk assessment's divorce from context causes an abstraction of its predictions and if included as a component of the totality of circumstances, may artificially contribute to the threshold of reasonable suspicion.

Having established that the use of risk assessments lowers the practical threshold of suspicion necessary to be considered 'reasonable', the question remaining is whether this is legally defensible. Though in the case of the exigent circumstances doctrine, predictive policing is unlikely to be an acceptable justification for action, police are afforded wide latitude to be wrong in making a Terry stop. On a question of liability for incorrect police records data, the Supreme Court has held similarly to the actions of an officer executing an invalid warrant in good faith.[83] It has held that it is not the fault of an officer who in good faith relies upon a source of information which is purported to be fully and adequately maintained, and with which he/she mistakenly arrests an innocent individual.[84] Similarly, not only will the exclusionary rule not apply to evidence collected in this manner, but it is the burden of the wrongly arrested to prove that the officer was not acting in good faith and knew the individual to be innocent.[85] Based on this line of jurisprudence, it seems that the use of algorithmic predictive policing may be considered a legally appropriate contributor to officer discretion. However this again neglects the potential for bad data or algorithms, effects on individuals, and possible remedies for harms caused by error. As the Supreme Court has not yet ruled on the use of risk assessments for policing, it may be advocated that harm resulting of their use is dissimilar to a good faith officer error, as officers are generally unaware of the content or make-up of a risk assessment. Therefore

[82] *Reid v Georgia* [1980] Supreme Court of the United States 448 US 438, 441.
[83] Wayne Logan and Andrew Guthrie Ferguson, 'Policing Criminal Justice Data' (2016) 101 Minnesota Law Review 541, 577.
[84] Renan (n 22), 1089, citing Arizona v. Evans, 514 U.S. (1995) at 137.
[85] Logan and Guthrie Ferguson (n 99), 580-581.

while a risk assessment is unlikely to be an allowable justification for suspicionless stops, its use may be a permissible inclusion toward discretion.

3. United Kingdom

The threshold of suspicion necessary to make a stop and search in the United Kingdom follows similar guidance that is provided in the ECHR. As in other Council of Europe countries[86] if it is determined that there was an infringement, it must next be determined whether the action was proportionate to the legitimate aim of preventing crime, and whether "the power under which it was done is in itself incompatible with…the character of 'law' as required by the Convention."[87] The principle of legality is defined as a lawful, accessible, domestic basis for an action, as upheld by the ECtHR. In addition, the legal basis must contain "sufficient safe guards to avoid the risk that power will be arbitrarily exercised," causing an "unjustified interference" with a fundamental right.[88] There are three categories of the stop and search function in the U.K., each with a specific legal basis.[89] This sub-section will only address the use of a 'reasonable grounds search' also called a "Section 1" search, and the 'pre-condition' or "Section 60 search."

The reasonable grounds search refers to Section 1 of the Police and Criminal Evidence Act 1984 (PACE).[90] The PACE includes eight Codes of Practice that provide an explanation of the relevant police power for various aspects of their work. Critically to this analysis, Code A

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[86] Murdoch and Roche, "The European Convention on Human Rights and Policing; A Handbook for Police Officers and Other Law Enforcement Officials."
[87] *R (on the application of Roberts) v Commissioner of Police of the Metropolis*, [2015] UKSC 79, para. 15.
[88] *Beghal v. Director of Public Prosecutions*, [2015] UKSC 49, para. 29-30; *citing, Malone v. United Kingdom* (1985) 7 EHRR 14; and *S & Marper v. United Kingdom* (2008) 48 EHRR 1169.
[89] The other two types of stop and search are the 'no suspicion' or "Section 60 search" which requires the pre-authorization of a senior officer based on pre-conditions demonstrably being met. The third type of search also relies on a reasonability test in identifying potential terrorists or terrorist activity. See Jennifer Brown, "Police Powers: Stop and Search" (United Kingdom House of Commons Library, March 10, 2021).
[90] United Kingdom Home Office, Police and Criminal Evidence Act 1984 (PACE) codes of practice, 2020 <https://www.gov.uk/guidance/police-and-criminal-evidence-act-1984-pace-codes-of-practice>.

provides "Police Officers of Statutory Powers of stop and search."[91] Also of note, though not covered herein, stop and search powers vested in the police are also complemented by numerous subject matter statutes which confer and expand the power in particular instances that border on civil enforcement.[92] PACE Section 1 provides that officers may stop an individual on a suspicion based in reasonable grounds, for one of a list of enumerated crimes, including the 'misuse of drugs,' or possession of stolen or 'prohibited articles.'[93] The reasonable grounds search must be rooted in a "genuine suspicion" and based on "objective factors."[94] Factors must also be directly linked to the individual in question, so as to individualize the person to the suspected behavior.[95] Factors are not pre-determined, but generally fall into two categories: intelligence or information, namely information relayed to the officer; and suspicious behavior as observed by the officer.[96] In either case, whether an officer had reasonably formed suspicion as grounds to make a stop is viewed both from a subjective and objective vantage point. Subjectivity is determined by looking to the discretion of the officer, and objectivity may be similarly determined by whether it was it was an objective examination of the facts that led to this subjective conclusion.[97] Further, for an officer to attribute a reasonable suspicion to the situation, it must be based on possession of "sufficient" relevant information, rather than a requirement that all information supports the suspicion.[98] Put differently,

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[91] United Kingdom Home Office, Code A Revised Code of Practice for the exercise by: Police Officers of Statutory Powers of stop and search, 2015 <https://www.gov.uk/government/publications/pace-code-a-2015>.
[92] Tim Newburn, Tom Williamson and Alan Wright, 'Law and Criminal Investigation', *Handbook of Criminal Investigation* (Routledge 2007), 103.
[93] United Kingdom Home Office, Police and Criminal Evidence Act 1984 (PACE) Code A, Section 1.
[94] Id.
[95] Andrew Ashworth and Lucia Zedner, *Preventive Justice* (Oxford University Press 2014), 57.
[96] Brown (n 19), 7.
[97] Id.
[98] *The Commissioner of the Metropolis v. Raissi*, [2008] EWCA Civ 1237, para. 15-17; *citing also, McKee v. Chief Constable for Northern Ireland*, [1984] 1 WLR 1358; *Fittschen v. The Chief Constable of Dorset Police*, [2022] EWHC 399 (QB), para. 15.

> "It relates entirely to what is in the mind of the arresting officer when the power is exercised. In part it is a subjective test, because he must have formed a genuine suspicion in his own mind that the person has been concerned in acts…in part also it is an objective one, because there must also be reasonable grounds for the suspicion which he has formed. But the application of the objective test does not require the court to look beyond what was in the mind of the arresting officer. It is the grounds which were in his mind at the time which must be found to be reasonable grounds for the suspicion which he has formed. All that the objective test requires is that these grounds be examined objectively and that they be judged at the time when the power was exercised."[99]

Discretion therefore encapsulates the formation of reasonable suspicion in large part on the account of the officer. Despite this, neither a simple hunch, nor an individual's personal characteristics, may form the basis for meeting the threshold of suspicion.[100]

Though the test of objectivity generally requires consideration of what others may consider reasonable, the High Court of Justice of Northern Ireland has posited that courts are to have no "regard to different considerations that might have influenced others," as the determination of what factors are relevant is in itself a form of exerting discretion.[101] The articulable suspicious behavior of the individual in context may be sufficient to meet the reasonable standard, even in the absence of specific information or intelligence.[102] "Suspicion in its ordinary meaning is a state of conjecture or surmise where proof is lacking…[it] arises at or near the starting point of an investigation of which the obtaining of *prima facie* proof is the end."[103] It is therefore not necessary that an officer is in possession of evidence that amounts to a

[99] *O'Hara v. Chief Constable*, [1997] 1 All ER 129, 138-9; also quoted by *An Application for Judicial Review by Silvana Alexander, and Others*, [2009] NIQB 20, para. 13.
[100] Brown, "Police Powers: Stop and Search."
[101] *An Application for Judicial Review by Silvana Alexander, and Others*, [2009] NIQB 20, para. 11.
[102] Home Office, Code A Revised Code, Section 2.6B, 8.
[103] *Fittschen v. The Chief Constable of Dorset Police*, [2022] EWHC 399 (QB), para. 6*; quoting Hussien v. Chong Fook Kam* [1970] AC 942.

prima facie case or sufficient to make an arrest. It also therefore follows that hearsay evidence may contribute to forming a reasonable suspicion, so long as the officer is aware of such information at the time of the stop, as the ability to determine discretion "vests" in that individual officer in that moment.[104] Similarly, that an individual was previously convicted of a crime is not sufficient cause for stopping them in this context,[105] nor is the social relation between particular individuals, though relevant, grounds alone to constitute suspicion.[106]

As in other jurisdictions, courts find that actions taken with good faith discretion, even when the result is apparent error, does not necessarily mean that a police officer acted unlawfully. Indeed, the Supreme Court Judicature Court of Appeal held that "it is a possibility inherent in the need for police investigations into serious offences to be diligent that it may sometimes happen that a person is arrested on reasonable grounds but it turns out that he was not responsible….suspicion is a state of mind well short of belief and even further short of a belief in guilt or that guilt can be proved."[107] Instead what is considered is the "single question which [is] whether the policeman had reasonable grounds for suspecting" that an individual was implicated in a crime.[108] Though the use of a stop and search is namely to apprehend suspects or thwart crime, as in other jurisdictions stops may also fulfill the purpose of an investigatory inquiry. It was reported that of one million stops in the years 2012-2013 under Section 1 of PACE in the U.K., only ten percent ended in arrest.[109] In applying the use of categorical or algorithmically generated suspicion to a reasonable grounds stop, the use of inarticulable information may be

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[104] *The Commissioner of the metropolis v. Raissi*, [2008] EWCA Civ 1237, para. 13; *citing also, Hussien v. Chong Fook Kam* [1970] AC 942, 949; and *Mohammed-Holgate v. Duke*, [1984] AC 437, 464, 446.
[105] Home Office, Code A Revised Code, Section 2.2B.
[106] *Buckley & Ors v. The Chief Officer of the Thames Valley Police*, [2009] EWCA Civ 356, para. 9.
[107] *Castorina v. Chief Constable of Surrey* [1998] LG Rev Rep 241, *quoted* in *Buckley & Ors v. The Chief Officer of the Thames Valley Police*, [2009] EWCA Civ 356, para. 6.
[108] *Buckley & Ors v. The Chief Officer of the Thames Valley Police*, [2009] EWCA Civ 356, para. 6.
[109] College of Policing (n 61), 3.

sufficient to meet the threshold of suspicion necessary, but seemingly only in the case that an officer can accurately tie it to an individual and within real-time context.

In the case of a reasonable grounds search, predictive policing may lawfully meet the threshold as intended, dependent upon how the officer interacts with a risk assessment. This requires guidance on not only "high-level principles" like data ethics, for example, but also practical information for the users of the technology (police officers) who need to understand how the tool functions, further validating the intelligence garnered by the tool.[110] In determining whether an officer's decision to make a stop was lawful, courts will apply the test of subjectivity and objectivity. For instance, given a statistical likelihood that a burglary will take place in a neighborhood one evening per the risk assessment, the officer must also weigh whether one's behavior is additionally suspicious in that context rather than just the individual happens to be there at night. The use of a risk assessment to determine the profile of a likely burglar may be considered as indirect evidence, only if the officer observes an individual acting in a way suggestive of burglary would there be potential direct evidence. Therefore the officer's reliance on the indirect evidence as provided by the risk assessment may only be objectively sound if he/she understands the tool and why it is (or not) trustworthy. Whereas case law of the ECtHR is heavily reliant on the certainty and specificity of a perceived to-be likely offense, a reasonable grounds stop according to PACE relies in large part on officer discretion as to determining whether suspicion exists.

[110] Justice and Home Affairs Committee, 'Technology Rules? The Advent of New Technologies in the Justice System', 34.

D. 'High crime areas' in practice

The foregoing has analyzed the way in which predictive policing alters police standards and related protections. To test the integrity of a true suspicion in the case of predictive policing, and the degree to which a threshold is truly met as set out in law, the designation of a high crime area will be applied to the thresholds discussed above.

The designation of a high crime area according to the output of a risk assessment is one of the most well debated subjects in discussing suspicion and predictive policing. The concept itself is at immediate odds with the notion of an individualized suspicion, and rather may be described as a form of categorical suspicion, in which suspicion is based on a particular profile or category of (place or person).[111] A high crime designation (identifying one area over others as most prone to crime) is one in which heuristic methods would follow an identical logic, in that known correlates to past crime may indicate relevance to future crime. It could be argued that high powered data processing may come to the same conclusion as an officer familiar with an area when provided the statistics on particular types of crimes, their details, and perpetrators.[112] In fact one of the most stated complaints by officers using risk assessments is that they do not provide much added value.[113] However the use of an algorithmic assessment may increase the nuance of the designation or widen the scope of what may qualify as 'high crime' due to the ability to synthesize myriad data. It is also worth noting that by identifying a location as high crime it will be the subject of more frequent patrols, therefore the site for heightened arrest

[111] Pete Fussey, Bethan Davies and Martin Innes, '"Assisted" Facial Recognition and the Reinvention of Suspicion and Discretion in Digital Policing' (2021) 61 British Journal of Criminology 325, 326.
[112] L. Waardenburg and Marleen Huysman, "Digitizing Crime" (34th European Group for Organizational Studies Colloquium, Tallin, Estonia: Vrije Universiteit Amsterdam, 2018).
[113] 'Towards Policing 3.0: Digital Transformations in Policing to 2025: Anticipation and Performance' (National Institute for Advanced Studies in Security and Justice 2016) Strategic Diagnostic Group n.3, 48-50.

numbers, and eventually the risk assessment has not only determined where may be suspicious, but in fact made statistically more likely to be considered suspicious in the future.[114]

Regardless of jurisdiction, the high crime designation alone is problematic and similar to the lack of definition on what constitutes a "high" level of crime, the minimum or maximum physical bounds of what may constitute an "area" is largely undefined in many jurisdictions.[115] Though particular programs identify high risk by chosen parameters, these are often artificially constructed and do not necessarily conform to the actual geography of a place. In addition, it has been shown that 'automation bias' increases trust in AI tools, by which the output of machine generated content is believed to be more reliable than information that may have been generated by a human mind.[116] This may lead to reliance on machine generated predictions in the absence of actually understanding the internal processes, or what 'high crime' means in practice. This is doubly problematic if machine or human-programmed biases are also present. It is argued herein that unquestioning acceptance of the designation may indeed be the main point of convergence from high crime as determined by traditional discretion. Despite this, high crime still has not been defined or quantified in any meaningful or uniform way, but may be seen only as a relative measure which alone means very little.[117]

Thinking about a high crime area in the context of jurisdictions subject to the ECHR, it is argued that policing, even in the absence of arrests affects individuals and groups without the protection of Art. 5 and Art. 8 ECHR. As discussed, a high crime area designation in predictive policing inherently means that more patrols will be directed to a particular area. Statistically,

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[114] Matthias Leese and Simon Egbert, 'The Police and Technology', *Criminal Futures; Predictive Policing and Everyday Police Work* (Routledge 2020), 61.
[115] Andrew Ferguson, 'Crime Mapping and the Fourth Amendment: Redrawing "High-Crime Areas"' (2011) 63 Hastings Law Journal 179, 203.
[116] See Chapter 5 for a discussion on the various forms of bias that may be present in AI and as in the practice of predictive policing.
[117] Goldberg, "Getting Beyond Intuition in the Probable Cause Inquiry."

stops and arrests in this area are likely to increase by virtue of a police presence. This also means the generation of additional police records where they may otherwise not been created, as well as the collateral effects that include the increased likelihood of a future arrest in intensification of later legal action. In addition is the enhanced stigmatization of individuals and neighborhoods therein, as well as potentially racial or ethnic stereotypes attached to individuals due to their presence therein. As in a criminal investigation large amounts of data are collected on individuals and communities, allowing for the accumulation of data that may be used at a later date.

However as discussed in the foregoing, in the absence of an arrest or other form of custodial stop, the protective function of Art. 5 against infringements on liberty is unlikely to apply. Though predictive policing acts as a *de facto* investigation in tactics and allows for similar outcomes for individuals implicated as suspects, there is no violation and no claim to be made according to ECtHR jurisprudence. Similarly, the Art. 8 right to privacy can do little to protect individuals against the use of risk assessments that may portray circumstances necessary to believing that an innocent individual may be more suspicious based on whereabouts and group characteristics. Despite the lack of protection against these *de facto* preventative investigations, individuals are subject to enhanced police scrutiny.

The U.S. presents a somewhat divergent picture, as the designation of a high crime area, which informs a large portion of predictive policing patrols, presents an apparent grey area between the application of a Terry stop based on reasonable suspicion, and the reasoning of the exigent circumstances analysis, much like the Section 60 stop in the U.K., and exposes an inherent separation from police discretion. In 2000, the U.S. Supreme Court declared that a high crime area may play a large part of the totality of the circumstances analysis as officers are “not

required to ignore the relevant characteristics of a location." The Court even further elaborated that unprovoked flight in such an area was enough to warrant an investigatory stop outright.[118] However it is unclear as to what weight the prediction should receive in this analysis. Based on the Court's analysis in *Curry*, it appears that a high crime designation as utilized in a predictive policing patrol will not meet the requirements of exigency without an objective emergency, nor will it warrant an investigative stop without additional justification.[119] The Court then seems likely to adopt the approach that place-based predictive policing may be sufficient for prioritizing patrols, however its use may not provide the sole impetus for suspicion upon which a stop is based. Despite this, it is well established in reasonable suspicion doctrine that location may lend strongly enough to the totality of the circumstances to make otherwise non-suspicious behavior appear suspicious, therefore *de facto* lowering the standard for forming suspicion.[120]

Applying the high crime designation to reasonable suspicion is well debated among legal scholars in the context of American jurisprudence as relates to predictive policing and various tests have been put forward to define 'high crime.'[121] The First Circuit has deemed the quantification of 'high crime' as a "factual issue" which requires a uniform definition, consistently applied methodology, and the determination of what will constitute a rebuttable presumption.[122] More importantly to the focus of this work, courts generally hold that if an officer acted on a reasonable suspicion in the belief that an area is more likely to experience high levels of crime, then regardless of whether the designation was faulty, the officer is credited with

[118] *Illinois v. Wardlow*, 528 U.S. 119, 124 (2000).
[119] *Curry* at 331.
[120] Decker, John, 'Emergency Circumstances, Police Responses, and Fourth Amendment Restrictions' 89 Journal of Criminal Law and Criminology 2 (1999) at 457-459.
[121] Koss, "Leveraging Predictive Policing Algorithms to Restore Fourth Amendment Protections in High-Crime Areas in a Post-Wardlow World."
[122] *United States v. Wright*, 485 F.3d 45, 53 (1st Cir. 2007), *quoted in* Andrew Ferguson and Damien Bernache, 'The "High Crime Area" Question: Requiring Verifiable and Quantifiable Evidence for Fourth Amendment Reasonable Suspicion Analysis' [2008] American University Law Review at 1613.

having acted in good faith, absent a showing to the contrary.[123] High crime is "an articulable fact" that with other, " more particularized factors" may support reasonable suspicion.[124]

As a second matter, a lack of individualization is implicated. The high crime designation is suggested herein as a 'reverse' formulation of reasonable suspicion, in which rather than particularize suspicion to an individual, the environment is the focus of anticipation and individuals as members of a demographic constitute factors which may then be implicated in suspicion, rather than the initial subject of focus. U.S. courts have taken up the issue of particularized suspicion in a case in which a judge relied on a statistical analysis for enhancing a defendant's sentence on the basis of others similarly situated, addressing him as a member of a reference class rather than an individual.[125] With the resulting information, the judge found it appropriate to give the Appellant an enhanced sentence based on the pattern and severity of his assumed crime(s), calculated and extrapolated from statistical inference based on the group.[126] As was raised in appeal, this use of statistical analysis is problematic, as it assumes that because the majority of members of a class have acted in a certain manner, that all individuals of the class

[123] National Academies of Sciences, Engineering, and Medicine, *Proactive Policing: Effects on Crime and Communities* (The National Academies Press 2018), 92.
[124] *United States v. Kehoe quoting United States v. Sprinkle*, 106 F.3d 613, 617 (4th Cir. 1997).
[125] Following a series of appeals, the Second Circuit Court was tasked with determining the appropriateness of using a 'reference group' to extrapolate individual details for determining an adequate, fair prison sentence.125 Among other details, the Court was to determine whether a sentence may be enhanced at least in part on the findings of a statistical analysis, in this case, the similarly situated comparison. In the original case, the Appellant was convicted of drug smuggling into John F. Kennedy International Airport in New York City, in possession of 427.4 grams of heroin, ingested prior to departure from Nigeria. At the time of sentencing the judge noted that the Appellant had made numerous other trips on the same itinerary and had even previously been arrested on drug charges in the past. Though the Appellant was never convicted of smuggling, the judge inferred that based on the his patterns of travel and previous charges it was likely that he had also smuggled drugs on previous trips to Nigeria.
Using the details of the Appellant's known crimes, details of the instant conviction, and prior travel on the same route, set against the details of 128 other convictions of individuals smuggling heroin from Nigeria to New York in the same time frame, the judge estimated the likely amount that the Appellant would have smuggled on previous trips to a degree of 0.99 certainty. Therefore the judge found that by treating the Appellant as a member of this group, or class of convicted smugglers, it could be ascertained if and how much heroin the Appellant was likely to have smuggled on previous trips in the absence of evidence or charge.
[126] In the analysis of the Court it is considered to be one part of the decision to enhance the sentence and not the sole factor. In addition the Court weighs the perjury of the defendant as grounds for issuing an enhanced sentence. See, *United States v. Shonubi*, 895 F. Supp. 460 (E.D.N.Y. 1995).

should be automatically treated as also having acted in this way under similar circumstances. As has been pointed out, the Appellant belonged to more than a single reference class, likely hundreds, accounting for occupation, domicile, education, nationality, etc.; variables many of which when relied upon to predict illegal behavior would not come to the same conclusion.[127]

Applied to a Fourth Amendment analysis of the use of predictive policing in a high crime area, it may be asserted that a reasonable suspicion is based largely on a reference class-like formulation in which an officer treats an individual as behaving as other members of a group based on their shared location. As such, it lacks individualization and discards other groups to which a person may belong, not to mention personal autonomy.[128] This issue is similarly at the core of profiling, however it is relevant to the use of high area crime designations as well, as the designation dilutes discretion and individualization, but instead treats location as an environmental factor to which individuals 'belong.' This may translate into a form of contextual integrity whereby sets of rights such as data protection are defined according to context. Applied to an individual in the reasonable suspicion analysis, this is a perverse application of discretion and undermines the role of suspicion in policing.[129]

In the case of the U.K., there have been no directly applicable judgments to date, however looking to two parallel examples may lead to the conclusion that a high crime designation is not an appropriate meeting of the suspicion threshold. First, looking to jurisprudence on the use of automated facial recognition (AFR) technology as used by the police, the Court of Appeals held in *R (Bridges) v. CC South Wales*, that the law must provide protections against arbitrariness and clearly identify the scope of discretion as exercised by the

[127] Mark Colyvan, Helen Regan and Scott Ferson, 'Is It a Crime to Belong to a Reference Class?' (2001) 9 The Journal of Political Philosophy 168, 172.
[128] Jeremy Davis et al., "Five Ethical Challenges Facing Data-Driven Policing," *AI Ethics*, 2022.
[129] Helen Nissenbaum, "Privacy as Contextual Integrity," *Washington Law Review* 79 (2004): 119-.

relevant authorities.[130] In this case the Court held that the quality of law was not met in the use of AFR technology by police as there were not appropriate safeguards in place specifying the degree and bounds of discretion afforded the police when using this technology, therefore risking arbitrariness. Though the discretion of police using risk assessments to determine high crime areas is bounded by the requirements of a reasonable grounds stop, it is herein argued that the use of an area rather than the characteristics of an individual as described above, risks an arbitrary allocation of suspicion. Where an area is designated high crime and therefore individuals situated within may be considered *de facto* at a higher level of suspicion, it may be argued that the quality of law requirement it not adequately met.

Second, an alternative argument to the foregoing is that the lack of individualization and recourse to victims of wrongful stops in the form of a Section 60 stop may provide a parallel analysis. The Section 60 stop is characterized by the lack of a necessary reasonable suspicion and is generally for obtaining evidence of a crime, or would-be evidence of a potential crime which is usually a weapon, that would not be recoverable in a typical search.[131] The search may be authorized for up to 24 hours,[132] and may be executed within that time frame regardless of an individual officer's independent belief that the person or place to be searched is related to a crime.[133] The Section 60 search is highly controversial as it allows an officer to stop and question an individual, based on certain pre-conditions and with advanced blanket approval, without justifying it by reasonable suspicion.[134] According to Section 60 of the Criminal Justice and Public Order Act 1994, a senior officer may authorize subordinate officers to make suspicionless

[130] R (Bridges) v. CC South Wales, no. C1/2019/2670 (2020), at para. 94.
[131] College of Policing, "Best Use of Stop & Search Scheme."
[132] *R (on the application of Roberts) v Commissioner of Police of the Metropolis*, [2015] UKSC 79, para. 36.
[133] Home Office, PACE Code A, Sec. 60(1)(a-b).
[134] Home Office, PACE Code A, Sec. 60.

stops in a particular area, based on the "reasonable" belief that a violent crime has or will occur there.[135] In practice, the Section 60 authorization functions much like an arrest warrant but without specificity for an individual or item. Among the guidelines for the use of Section 60 is that authorizations are only granted when necessary ("rather than merely expedient") and for a statutory purpose, in relation to future serious violence that an officer reasonably believes "'will', rather than 'may', take place…"[136] According to such an authorization an officer is authorized to "stop any pedestrian and search him or anything carried by him for offensive weapons or dangerous instruments; and to stop any vehicle and search the vehicle, its driver and any passenger" for the same.[137] Applying the Section 60 criteria to a high crime designation, it is easy to imagine the discrepancy between "will" and "may" commit a crime, and the potential for bad data or any number of biases to affect the output.

Even in the case of a Section 60 stop which requires prior authorization in the confines of pre-determined oversight mechanisms, the Supreme Court of the U.K. echoed this conclusion, finding that "the temporal and geographical restrictions [are] no real check" as the officer is given no requirement to show reasonable suspicion.[138] The ECtHR confirmed that this form of a stop is in practice "difficult if not impossible" to verify as lawfully executed, as there is little to no discretion necessary for such execution.[139] As the use of suspicionless stops greatly decreases the role of discretion for the subject officer, mirroring the role of a high crime designation for police patrols, there is a demonstrated, comparable disconnect with context. Though a higher ranking officer must reach the standards necessary for securing Section 60 authorization, further

[135] United Kingdom Home Office, PACE Code A, Sec. 60.
[136] College of Policing, "Best Use of Stop & Search Scheme."
[137] Home Office, PACE Code A, Sec. 60(4)(a-b).
[138] Id.
[139] *Gillan v. United Kingdom* (2010) 50 EHRR 1105, para. 86, *quoted by R (on the application of Roberts) v Commissioner of Police of the Metropolis*, [2015] UKSC 79, para. 20.

dissonance is achieved, in that the officer authorizing the power is often not the officer executing the power. Discretion is therefore unhinged from investigation and/or patrol, and the subsequent use of the Section 60 authorization is based more on intelligence than on the ground observations. In the same way, it may be argued that the use of a high crime designation in guiding police controls has a similar effect on the executing officer, in that a certain level of autonomy is inherently relinquished to the mechanics of prediction. To the extent that Section 60 stops are legal, the use of a high crime designation is necessarily different in that there is no verification of the data used or internal processes of the risk assessment. Therefore while the Section 60 search is generally inapplicable to the formation of suspicion, it provides a useful parallel to the use of risk assessments and specifically the high crime designation.

It is herein posited that to the degree that a risk assessment may confer a particular place and time as most likely to be the object of certain categories of crime, police are required to meet much lower barriers for forming reasonable suspicion across thresholds and jurisdictions.

1. Are due process standards met?

This thesis aims to determine what legal framework(s), are the most applicable to the use of predictive policing. This chapter addresses the way in which predictive policing affects thresholds of police suspicion and the initiation of fundamental rights protections. Accepting that it lowers thresholds of suspicion while failing to meet the threshold to trigger protections, the concluding question must be if/how this affects due process rights of future defendants. Though predictive policing necessarily proceeds the issuance of a charge, or policing procedures which proceed a trial, even those occurring prior to a charge and investigation, it necessarily plays a very important role in the outcome of the trial and must be considered relevant to defendants'

trial rights.[140] Police interactions with an eventual defendant, from the point at which an officer is persuaded to have the requisite threshold of suspicion to the arrest and collection of evidence even if in the form of testimony, is relevant to the fairness of a later trial, ensured in part through fundamental rights. Therefore the methods and information used to satisfy suspicion are relevant to due process rights as well as the efficacy of a case for the prosecutor.

First, the use of evidence to propel the prosecution's case at trial begins to occur at first instances of police-defendant interaction, and its substance and procurement directly impacts the ability of the defendant to view and challenge the proffered material. In most situations evidence is inherently collected during a police investigation and may range in collection methods and timeline, sometimes even pre-dating the criminal charge. For instance, a defendant's behavior and the police perception of the same leads to an interaction that may subsequently lead to the procurement of an arrest warrant, on-spot interrogation, and/or issuance of a charge.[141] Therefore if an individual is stopped due to a suspicion falling below the requisite threshold, such as dictated by risk assessment, the individual has unfairly been brough under police scrutiny in the first instance. If the evidence was badly or improperly collected it may be inadmissible, just as if the stop or detention by an officer is unlawful, the charge may be dropped. These standards intended to balance the relative positions of the parties, clearly demonstrate that policing does in fact hold a critical role in a fair trial.

In addition to the genesis of a police interaction, the related information and anything submitted as evidence must be available and accessible to the defendant for challenge.[142] This is

[140] J Harvie Wilkinson, 'The Presumption of Civil Innocence' (2018) 104 Virginia Law Review 589, 591.
[141] Tim Newburn, Tom Williamson and Alan Wright, 'Law and Criminal Investigation', *Handbook of Criminal Investigation* (Routledge 2007), 100.
[142] Danielle Keats Citron, "Technological Due Process," *Washington University Law Review* 85, no. 6 (2008): 1249–1313.

particularly important when tools based on AI are used by police, such as risk assessments that inform predictive policing patrols. Risk assessments rely on complex processes that may hinder the ability to meaningfully engage with and challenge evidence, that is, render it practicably inaccessible to the defendant.[143] Knowledge of the tools' functioning, the data which it is fed, and the ability to synthesize and make sense of the potentially large output of information may similarly keep a defendant from benefiting from access to the evidence as it is in practice unusable.[144] This may result in a situation in which it is the claim of a defendant against that of the officer, with little ability to verify the information actually available to the officer as to how their interaction was initiated and proceeded. Similarly, the officer who may make a stop and subsequent arrest may have the ability to retrofit information after the fact, applying additional weight to the claimed threshold of suspicion.[145] The equality of arms is indeed protected to some degree by policing standards which dictate the collection of evidence, right against incrimination where/however applicable, and rights of individuals when interacting with police.

The second manner in which policing is implicated in the trial is the role of a police officer as a witness. Police are responsible for their actions in the lead-up to an investigation and must be able to provide articulable facts as to the situation in which he/she encountered an individual, how a reasonable suspicion was formed, and the justification for any apprehension or force that was used.[146] The officer must be available for challenge and a successful challenge may indeed cause a case to be terminated if it is determined that he/she acted improperly. Where suspicion may have been based in part on the output of a risk assessment which directed the

[143] Justice and Home Affairs Committee, 'Technology Rules? The Advent of New Technologies in the Justice System', 16.
[144] Anastasia Konina, 'Promoting Human Rights in the Context of Police Procurement: A Study of Predictive Policing Instruments' [2021] McGill Graduate Research Series: Law and the City, 14-15.
[145] Ferguson, "Big Data and Predictive Reasonable Suspicion."
[146] Andrew Sanders and Richard Young, "From Suspect to Trial," in *Oxford Handbook of Criminology*, Fifth (Oxford University Press, 2012), 838–65.

officer to a high crime area for example, there is no meaningful way for the defendant to challenge the officer's testimony as relates to the designation of a high crime area, the decision to patrol the area, and how to rate the weight of the designation in the formulation of suspicion. Police officers may also have the ability to retrofit information or bend their decisions to fit a narrative after making a fortuitous stop. Context, or the circumstances so important to forming the basis for meeting the threshold of suspicion, is technologically determined outside the reality in which a behavior occurs and may only be attributable as a correlated behavior after the fact. For this reason the use of risk assessments may make the perception of context and suspicion derivatively explainable *post facto* in the trial stage.

The effect of policing on fair trial processes is obvious by logic alone. That which precedes or precipitates an arrest, issuance of a charge, and eventual prosecution, obviously affects that which follows. Temporally and practically, a police stop may be seen as the point at which the adversarial process begins and the evidence and progression of a case begins to accrue.[147] It is quite clear that the role of the police cannot be divorced from the processes that grow from their initial patrols or arrests and end in the potential deprivation of liberty for a defendant. Just as certain standards are used to ensure the protection of individuals' rights, ensuring that policing standards are met similarly protects individuals from wrongful arrests or convictions. With the case of predictive policing, the effects may be even more insidious. As is demonstrated throughout the thesis, even in the absence of a charge, police records are likely to include many of the details of a stop which may follow an individual through their lives like a digital thumbprint.

[147] Andrew Sanders and Richard Young, 'From Suspect to Trial', *Oxford Handbook of Criminology* (Fifth, Oxford University Press 2012), 839.

In addition to the positive rights afforded a criminal defendant, there are also larger issues of fairness which must be respected. It is not only the obtaining of a proper outcome in a legal proceeding, but the manner in which the decision is reached is also important.[148] As described in Chapter 2, police legitimacy is built upon public consent and belief in police adherence to social norms and respect for individuals' rights. This may be further complicated by the role of private companies on the utility of predictive policing and the accessibility of the relevant outcomes, creating a hierarchy in which third parties and police sit above challenge.[149] A *de facto* shift in policing power, which automates the role or place of authority or makes it unchallengeable may have severe repercussions for policing.[150]

E. Conclusion

As described in the foregoing, this chapter has outlined the ways in which predictive policing changes police standards and related fundamental rights protections vis-à-vis policing. The threshold of suspicion necessary for police to make an interference with the privacy and dignity of private individuals is an important check on police powers. The move from purely human discretion to one that is influenced by machine output may also be argued as a move from traditional criminal law enforcement, to an automated administrative function of law enforcement, in which individuals need only to meet a certain combination of indicators to be considered as *prima facie* suspicious.[151]

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[148] Caroline Kemper, 'Kafkaesque AI? Legal Decision-Making in the Era of Machine Learning' (2020) 24 Intellectual Property & Technology Law Journal 251, 270. Ric Simmons, "Big Data and Procedural Justice: Legitimizing Algorithms in the Criminal Justice System," *Ohio State Journal of Criminal Law* 15, no. 2 (2018): 573–82.
[149] Joh, "Ethical AI in American Policing."
[150] Matthias Leese and Simon Egbert, 'The Police and Technology', *Criminal Futures; Predictive Policing and Everyday Police Work* (Routledge 2020), 57.
[151] Daphna Renan, 'The Fourth Amendment as Administrative Governance' (2016) 68 Stanford Law Review 1039, 1074.

Set below the probable cause threshold necessary to make an arrest, suspicion requires an officer to be able to articulate in real time, the reasons for which an individual may be involved in a past, current, or imminent crime. In common law countries, the exercise of discretion sits with the officer alone, based on his/her knowledge, experience, and current perceptions. The threshold of suspicion also ensures that the criminal justice process moving forward, be it arrest through trial and sentencing, or immediate release, is predicated on a fair exchange.

In the case of a high crime area, for instance, an officer may guide his/her patrol according to the belief that crime is more likely to occur in a particular area. Therefore, any individual encountered in this area may already be deemed as to some degree suspicious, by nature of being so situated. Therefore the behavior of the individual necessary to meet the threshold of suspicious may be in practice much lower than the standard requires. This form of augmented discretion may lead to what has been termed algorithmic suspicion, or mechanical suspicion, changing the role of the police officer and the use of discretion in encountering a private citizen.

In addition, even where the risk assessment may be accurate and use accurate, true data, there are numerous due process ramifications for an individual whose arrest followed a stop predicated on predictive policing algorithms. The ability to challenge evidence, to hold an officer accountable after the fact, and to dispute the utilized data is skewed against the defendant in cases originating in predictive policing methods. In each of the jurisdictions assessed, it appears clear that the current standards and jurisprudence by which thresholds of suspicion are reached and triggering of protections do not hold up when subject to predictive policing. Even in the U.S. where high crime designations have been held to be acceptable components within the formulation of reasonable suspicion, the future potential for a fair trial is clearly affected.

The chapter has therefore set out to argue that in countries like the U.S. and the U.K., the use of risk assessments and predictive policing supplant or at a minimum, supplement the discretion of a police officer. As a result, the level of officer suspicion actually necessary to reach the threshold is decreased. Consequently, the fairness of a police encounter is tipped in favor of the officer with little recourse for the individual in question. In European and civil law countries, it is clear that the potential harms of predictive policing sit outside the auspices of the fundamental rights framework. In both contexts, individuals face enhanced policing tactics without enhanced application of protective mechanisms, such as due process guarantees or fundamental rights.

Chapter 5: Tensions within Fundamental Rights Framework

Introduction

This chapter examines two forms of protection that may be infringed upon by the use of predictive policing: the right against discrimination and data protection. As anti-discrimination applies to policing generally, this chapter will first seek to examine how potential violations of the right may be exacerbated by predictive policing. It will be further argued that an exhaustive attempt to mitigate discrimination or biases inherent in predictive policing software through the use of comprehensive audits on data populations may paradoxically implicate the right to data protection or privacy. It is therefore posited that much as the previous section on fundamental rights and due process rights indicated overlaps and tensions between application of the various rights, this chapter will seek to demonstrate that within the fundamental rights framework, the pursuit of one right, such as anti-discrimination, may necessarily result in violations of other rights, such as data protection and privacy.

In Part I, the chapter will begin by describing the enforcement frameworks to which police are subject vis-à-vis discriminatory policing. It will next outline the ways in which biases contained in data either human, error, or statistical, are captured and further engrained by algorithmic processing. In this context the use of criminal profiling as a tool for preventing crime herein referred to as 'predictive profiling' will be discussed as a feature of predictive policing. In contrasting the use of 'traditional' (*post facto*) criminal profiles from predictive profiles, it will be demonstrated that the algorithmic processing of police data to prevent crime results in increased instances of potential unlawful profiling based on data or human biases. Finally, the comparative analysis of jurisdictions will assess how discriminatory policing is legally defined

and interpreted by courts in various systems, and how predictive policing may be analyzed in light of the existing caselaw. These findings all allow the argument that the existing enforcement framework for discrimination in policing generally does not necessarily provide adequate protection against discrimination in predictive policing, nor does it account for additional forms of bias that exist within the use of risk assessments.

The second part of this chapter will examine the right to data protection to determine whether its application to predictive policing confers any additional protection to individuals. Though it will be observed that data protection is not engineered with criminal law in mind, looking at its applicability through the lens of predictive policing may be instructive as to inadequacies when applied to algorithmic processing. To this end, the specific laws and data protection regulations applicable in the EU will be juxtaposed with the U.S. where no general data protection applies, to determine whether this is a practically effective right within the context of predictive policing. In concluding, it will be argued that though a data protection framework for law enforcement agencies exists, in practice it is not tailored to criminal law and procedure, particularly when applied to the case of predictive policing.

Finally, the analysis will turn to the specific challenges of using AI for predictive policing as it affects the foregoing rights. Specifically, the section will discuss strategies within AI methods for ridding machines and outputs of bias. However it will be shown that one of the strongest proposed methods for ameliorating discrimination will violate data protection rights. In summary, the chapter will argue that the specific uses and forms of predictive policing cannot be adequately applied to the fundamental rights framework fully.

I. Discrimination

A. Discriminatory policing and traditional enforcement mechanisms

As described in Chapter 2, police act with the power vested in them by the state, either according to affirmative powers conferred upon them, or within a framework from which they may not stray. In either case, there are schema of checks and balances by which they are held accountable for their actions. This section briefly outlines discriminatory policing and the checks against it. It will then go on to discuss biases, as precursors to, but distinguished from discrimination and the role of predictive policing in generating or fostering biases.

Discrimination is the differential treatment of an individual from others similarly situated solely, or predominantly, due to a real or perceived personal trait.[1] It can take different forms and manifest in varying ways.[2] The two most commonly encountered forms of discrimination are direct and indirect discrimination which though potentially comparative in effect are legally distinguished by intent.[3] Direct discrimination is the differential treatment that results of an overt and knowing act or policy toward a particular group over others. Indirect discrimination is the application of a practice that is on its face neutral, however in practice negatively impacts one group disproportionately to others, or has a disparate impact.[4] The traits according to which an action may be considered discriminatory are defined according to statute or another comparable

[1] European Agency for Fundamental Rights, 'Understanding and Preventing Discriminatory Ethnic Profiling: A Guide' (European Agency for Fundamental Rights 2010), 34.
[2] Discrimination may also be multiple, which takes place on the basis of several, separate, grounds; or intersectional, which several grounds of discrimination operate together to form a specific ground of discrimination. See European Agency for Fundamental Rights, "Preventing Unlawful Profiling Today and in the Future: A Guide" at 26.
[3] In the context of U.S. law there are two forms of claims invoking equal protection which both may be the result of direct discrimination; 1) an individual officer acts in a way motivated by race; 2) selective enforcement toward a particular race is the policy of a department. See "Racial Profiling: Legal and Constitutional Issues" (United States Congressional Research Service, April 16, 2012) at 4.
[4] European Agency for Fundamental Rights 23-24.

legal authority. In the case of the ECHR, illegitimate, prohibited grounds for discrimination include sex, race, color, ethnicity, religion, and social origin.[5] These traits may be defined as "protected" characteristics. In the U.S., for instance, the traits are defined relative to the context in which they are adjudged by the Court, subject to differing levels of judicial review. For this reason they are considered "suspect" according to the level of protection they receive relative to the instance in question.[6] Generally, prohibitions on discrimination are levied at state actors and authorities. Discriminatory policing is policing which is predicated on the belief that a particular (usually group) trait makes an individual more or less likely to be the perpetrator or victim of a crime. Officer prejudices held against particular groups may also manifest as an outward apathy or antipathy toward particular areas or communities, resulting in inappropriate applications of law enforcement.

There are numerous, often interrelated means by which police are held accountable for discriminatory actions in the course of their duties. Supranationally, restrictions or affirmative duties may be dictated by bodies such as the Council of Europe or the European Union, through which states are required to implement legislation barring discrimination and/or requiring affirmative actions to prevent it, or investigate instances in which it occurs. At the highest level within a state, police as state actors are bound by constitutional principles, which where applicable often reflect supranational instruments. When this is the only or main source of regulation, as in a system such as the U.S., courts are generally the arbiters of determining instances in which unlawful behavior has occurred and those principles which have been violated. However in most jurisdictions, police are additionally subject to specific policing

[5] European Convention on Human Rights, Article 14.
[6] European Agency for Fundamental Rights, "Handbook on European Non-Discrimination Law," Handbook (European Agency for Fundamental Rights, 2010).

regulations. These regulations are established as the legal basis for specific police actions, such as the use of force or the issuance of an arrest. Guidelines may also set prohibitions on specific behaviors and practices, such as discriminatory arrests, unlawful profiling, and inappropriate use of force. In the U.K., police are subject to the statutory regulations set forth in The Police (Conduct) Regulations 2020.[7] The applicable regulation in France is the Code of Ethics of the Police and Gendarmerie.[8] In these and many other jurisdictions, there are at a minimum two levels of statutory frameworks for enforcement of non-discriminatory policing and available remedy.

In some legal systems individual police departments may provide an additional layer of oversight via internal regulations.[9] These regulations may stipulate that police officers who act unlawfully may be subject to professional sanctions, suspension, or termination. While internal police regulations generally mirror the applicable legal statutes and constitutional prohibitions against discrimination, they also provide a level of professional accountability aimed at deterring occupational malfeasance which is practically, often in the form of unlawful behavior toward citizens. Instances of non-compliance may result in a citizen complaint *post facto*, or sometimes as raised by a peer officer. There may also be mechanisms in place by which monitoring is regularly conducted in order to detect trends in citizen complaints or recorded incidents of unlawful police behavior. In some countries the technologies used for predictive policing are used to regulate police conduct.[10]

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[7] United Kingdom Home Office, "The Police (Conduct) Regulations 2020, No. 4 <https://www.legislation.gov.uk/uksi/2020/4/made>.

[8] Republique Francaise, Ministry of the Interior, Code of ethics of the police and the gendarmerie in France, Book IV, Title 3, Chapter 4 (Internal Security Code), 1 January 2014 < file:///C:/Users/kelly.blount/Downloads/code-deontologie-police-gendarmeie-version-anglaise%20(2).pdf>.

[9] Jill Lepore, "The Invention of the Police," *The New Yorker*, July 20, 2020.

[10] Timothy Cubitt (2021), "Effective management of serious police misconduct: A machine learning analysis," *Trends and Issues in Crime and Criminal Justice*, 633, Canberra: Australian Institute of Criminology, p 3.

Finally, police may be the defendants in a civil or criminal action, when an individual alleges a harm or violation against their person or interests.[11] Police are also accountable for discriminatory actions through an inverse application of individuals' fair trial rights. One example may be evidence improperly obtained in the course of an unlawful search or in the course of a custodial interrogation without a lawyer present, which may cause an entire prosecution to fail. Criminal procedure, rules of evidence, and exclusionary rules are all established to ensure that individuals are treated fairly, but as a result an officer who treats a party in a discriminatory manner will likely forfeit the success of the policing action.[12] However police oversight in most jurisdictions is hybrid in nature, combining some or all of the above mechanisms of enforcement, in addition to myriad forms of partnerships and oversight bodies at all levels of government.

B. Predictive Policing as a Conduit for Bias

This sub-section focuses on the ways in which predictive policing accelerates and reinforces biases in policing. Discrimination as the act of causing an unfair result, may be seen as a reaction to bias, which is the systemic, intentional or non-intentional preference which precedes discrimination.[13] Biases may be intentional or not, obvious or hidden. Compared with traditional policing in several legal contexts and frameworks, it is clear that predictive policing magnifies problems already occurring, without a proper check on the source of bias and means to

[11] In the U.S. the use of Civilian Review Boards may be employed as a community-police partnership which collaborates on police/community relations. For an example, see The Saint Paul, Minnesota Civilian Review Board < https://www.stpaul.gov/departments/police/civilian-review-board>
[12] United Nations Office on Drugs and Crime, *Handbook on police accountability, oversight and integrity*, United Nations Criminal Justice Handbook Series, 2011 <https://www.unodc.org/pdf/criminal_justice/Handbook_on_police_Accountability_Oversight_and_Integrity.pdf>
[13] Batya Friedman and Helen Nissenbaum, 'Bias in Computer Systems' (1996) 14 ACM Transactions on Information Systems 330, 332.

correct it. The following will first briefly describe four types of the biases relevant to predictive policing. It will next highlight specific ways in which not only does predictive policing allow for the propagation of discriminatory policing by replicating biases, it will also demonstrate the way in which it reinforces bias, making it more pernicious and difficult to identify and eliminate. It will be argued that the reliance on data, which are often erroneous and problematic from a practical standpoint, can entrench discriminatory attitudes, robbing predictive policing of its often perceived objectivity. In the following sections and analysis, it will be demonstrated that even in systems which include strong protections against discrimination, the use of predictive policing allows for biases beyond those which are envisioned in the anti-discrimination legal frameworks, as described below.

Human Bias may be the best known form of bias, which may also be the form of bias most often associated with discrimination. Indeed human bias may form the justification for discrimination, in that discrimination is the act predicated upon a bias. It may also be considered synonymous with prejudice, in that it shows a preference for one thing or group over another. In the case of a risk assessment, which mirrors policing attitudes, it may also be termed as 'pre-existing bias.'[14]

Machine Bias, which may also be defined as a form of differentiation, is an inherent part of the machine learning process, allowing distinctions to be made in the data. Machine bias, or also termed automated or technical bias, such as in a machine learning AI system, is merely the ability of the machine to distinguish between data points and make correlations based on some form of ordering. This is the manner in which the machine learning is intended to function and on its face is a neutral process. It may become a problematic when the machine learning becomes

[14] Friedman and Nissenbaum.

imbued with forms of data that may themselves be flawed, training the program in a wrong direction.[15] Similarly, in the case of policing we discuss proxy data as giving omitted categories such as race and gender presence in data through inferred connections. It is therefore necessary to consider the effect of compiling particular sets of data, as will be discussed below.

Statistical Bias, like machine bias is also a function of machine learning. Generally it comes from a gap between an estimated value as determined by the machine and its true value in the world. This is often due to the nature and methodology of measurement, in which quantifying a value in statistical terms does not necessarily match its real-world presence.[16] Relative to risk assessments, statistical bias may be the result of a decontextualization of algorithmic processes.[17]

Confirmation Bias may be viewed as the combination of a machine and human bias, wherein a result may be confirmed by the algorithmic process, becoming a part of the 'knowledge' contained in the data. By continuing the machine process of building upon known data relationships, the inference is self-confirming. This may also occur with a human officer, which in reaching a conclusion that is seemingly confirmed by context, an inference may become considered as fact.

1. 'Bad Data'

In addition to the role of data in generating biased results and potentially fostering discrimination, there are other ways in which data may adversely affect predictive policing. Data are at the core of algorithmic processing, and those most commonly used are police data. Though many other forms of data such as demographic data and open source information are critical,

[15] Hildebrandt, "The Issue of Bias: The Framing Powers of ML."
[16] 'Bias in Algorithms; Artificial Intelligence and Discrimination' (European Union Fundamental Rights Agency 2022), 23.
[17] Friedman and Nissenbaum (n 12), 334.

police records form the core body of information for generating predictions.[18] There are numerous ways in which these data may exponentially cause inaccurate results when used for making algorithmic crime predictions. Some data may be wholly incorrect, such as where an error in recording leads to records that do not reflect reality. Other records may be inconsistently constructed, causing an omission to appear as intentional. Regardless of the source of an error the result is potentially inaccurate assessments and skewed predictive outputs. In addition, data may be reflective of discriminatory policing in the form of over- or under-policing communities, resulting in or leading to, disproportionate arrest statistics between groups, reflecting human or 'pre-existing' biases. It is also well documented that many crimes go unreported, particularly within particular groups and for certain types of crime.[19] All of these inconsistencies will necessarily affect algorithmic biases, resulting policing and possible discrimination (direct or indirect), and the generation of new, flawed police records.

Police records reflect arrests, incidences of crime, calls for assistance, and the use of search and seizure. However these records do not necessarily reflect fact as much as acts of policing. High levels of police discretion have a substantial effect on which calls for assistance and crimes are reported and how, when, and whether arrests are issued, as well as the report that follows.[20] The content of crime and arrest reports as recorded by an officer are produced according to the officer's interaction with the situation and his/her perceptions and preconceived notions of a particular type of crime.[21] Similarly, though the use of emergency calls by citizens is

[18] Kate Robertson, Cynthia Khoo and Yolanda Song, 'To Surveil and Predict: A Human Rights Analysis of Algorithmic Policing in Canada' (University of Toronto 2020) at 19.
[19] Andrew Ferguson, 'Illuminating Black Data Policing' (2018) 15 Ohio State Journal of Criminal Law 503 at 514-515.
[20] Guthrie Ferguson, "Policing Predictive Policing" at 1148-1149.
[21] Brantingham, "The Logic of Data Bias and Its Impact on Place-Based Predictive Policing" at 475. Brantingham describes the way that an officer becomes aware of a crime (emergency call, in the commission, or post facto) affects his perception of the crime, as well as the circumstances on the scene. Each of these affects his decision

generally considered as potentially less affected by police biases than patrol and arrest records, this data may capture implicit community biases or reflect the underreporting of crimes in certain communities.[22]

Another type of data inaccuracy may be a misapplication of police records to current practices. That is, data that may accurately reflect a historic event that will far enough into the future allow inferences that may yield incorrect results. These data, referred to as "stale" or static data, are not necessarily inaccurate, but they are either no longer applicable or they are misleading in an inductive assessment. [23] This is because an arrest or school record is a historical artefact, which remains unchanged by time. Though factually accurate, these data may indicate very little about the present and may be misleading to an inductive reasoning software. This is very important in predictive policing, as these types of records are often prioritized as indicators of propensity for crime even if produced decades prior. Perhaps most critically, details such as the disposition of charges are not always included with the corresponding arrest data, allowing misleading inferences to be taken from an arrest record.[24] Examples of static data causing inaccuracy include attributing high risk to a particular postal code due to an isolated spike in gun violence[25] or an individual who is considered high risk based on a lack of significant educational standing as a child or encounters with the police as a young adult.[26] Though there may be justifications for scrutinizing continual reoffenders, this thesis posits that treating individuals

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whether and how to report or arrest; Henry, *Smoke but No Fire, Convicting the Innocent of Crimes That Never Happened*..

[22] Lum and Isaac, "To Predict and Serve?" at 15-16. *See also* Brantingham, Valasik, and Mohler, "Does Predictive Policing Lead to Biased Arrests? Results From a Randomized Controlled Trial" at 2.

[23] Perry et al at 92.

[24] James B Jacobs, *The Eternal Criminal Record* (Harvard University Press 2015) at 38, 155.

[25] Guthrie Ferguson, "Policing Predictive Policing" at 1179.

[26] A two year study in the U.S. tracked two years of data prior to an individual's arrest, looking at month to month data to understand how short term occurrences relate to arrest. Their findings indicated that short term negative occurrences, such as using drugs, increases propensity to commit crime. Conversely, positive short term events, such as moving in with a girlfriend or attending school reduces recidivism. *See* Perry et al., *Predictive Policing* at 91.

with a record of former police interactions as a *de facto* special class of persons meriting additional police scrutiny may create undue discrimination at the individual level and may constitute a type of bias.[27] These potential discrepancies between data and its translation into real world, actionable information has the potential to produce inaccurate and even harmful results in predictive policing.

2. The feedback loop

The feedback loop is the process through which a system continues to achieve the same result through self-confirmation, becoming a part of the body of the knowledge.[28] The model cannot ascertain if data is incorrect, therefore every bit of data is processed as a new part of the universe in which the machine exists and becomes a relevant part of the model.[29] Therefore every time a bad piece of data is processed in a calculation, its relationships to other data are fortified and it becomes increasingly relevant to the predictive analysis.[30] In the context of predictive policing, this has two practical meanings. The first alludes to feedback loop as a mechanical feature of AI and machine learning, described above.[31] The second element, which is arguably more pernicious, is the societal application in which policing exacerbates the feedback loop and causes real-world discrimination.

Circularly, police actions taken in the present on the basis of a predictive analysis not only rely on prior police records but are also regenerated in new records. Each of the biases previously discussed are typically inherent in predictive policing in some way and may thereby

[27] Campbell, "Criminal Labels, The European Convention On Human Rights And The Presumption of Innocence."
[28] Law Society Commission on the Use of Algorithms in the Justice System and The Law Society of England and Wales, "Algorithms in the Criminal Justice System" at 35.
[29] Lum and Isaac, "To Predict and Serve?"
[30] Wilson, "Algorithmic Patrol" at 120. *See also* Brantingham, Valasik, and Mohler, "Does Predictive Policing Lead to Biased Arrests? Results From a Randomized Controlled Trial" at 2.
[31] *Supra Note* 13.

be amplified through the feedback loop. This is self-reinforcing both algorithmically, when a certain data point or subject acquires more value by virtue of repeat entries into the system; as well as for police, who will be guided back to the same "high crime" areas or individuals.[32] The dual nature of the feedback loop in policing also translates to communities. If a certain ethnic group makes up the majority of individuals arrested for a crime in that locale, they will be more often stopped as the probable suspects for future crime based on their prolific presence in the data as well as the reinforced value of the area as high crime. As a result, the neighborhood becomes a proxy for ethnicity and ergo, the ethnicity for crime. Each time a 'hit' is made, it will confirm the system's prediction and the value of a correlation is reaffirmed and the data as predictors are together strengthened in relevance. In human terms, the end result will often be that individuals fitting these specific categories will statistically be the frequent subject of preventative patrols and stops, by nature of having previously confirmed as having relevant traits,[33] termed the "ratchet effect."[34] The lack of clarity within AI processes render it virtually impossible to dissect the data from the practice of predictive policing in order to correct these technical and human-generated deficiencies.

C. Predictive Profiling

A predictive profile is built using risk assessments based on correlations and inference drawn from myriad data to predict what traits are embodied by the perpetrator or location of an anticipated category of crime. This section will briefly discuss the use of profiling in the course

[32] Lum and Isaac, "To Predict and Serve?"
[33] Andrew Guthrie Ferguson, "Policing Predictive Policing," *Washington University Law Review* 94, no. 5 (2017): 1109–89 at 1148-1149.
[34] Simmons, "Quantifying Criminal Procedure: How to Unlock the Potential of Big Data in Our Criminal Justice System" at 981.

of a criminal investigation and extend its methodology to the use of predictive profiling. It will be suggested that a predictive profile, so designed by risk assessment with all its potential for exacerbating and generating biases, may constitute an unlawful use of the criminal profile as a policing tool.

1. Profiling and discrimination

Profiling is a complicated and morally charged tool afforded to police in the course of a criminal investigation. In the context of criminal investigation it is defined as a technique by which known facts are pieced together to create a holistic profile of an individual.[35] It may also be defined as the datafication and processing of information to identify and correlate patterns that may allow the creation of an inferred profile which may help understand or anticipate the unknown or unobserved.[36] The deduced patterns create the basis of a profile, on which policing decisions may be based.[37] In the case of an investigation it is in essence the categorization of individuals according to observable, unchangeable or immutable, characteristics, as well alterable characteristics, such as hair color. A profile as a descriptor is therefore an important means to solving crime and can be used to identify an individual based on his/her known characteristics or inferences drawn from them.[38] Lawful forms of profiling are based on "objective and reasonable justifications [that] comply with fundamental rights."[39]

[35] Farhad Mehdipour et al., "Reducing Profiling Bias in Crime Risk Prediction Models," *Journal of Applied Research & Practice* 1 (2021): 86–93.
[36] European Agency for Fundamental Rights, "Understanding and Preventing Discriminatory Ethnic Profiling: A Guide," Towards More Effective Policing (Brussels: European Agency for Fundamental Rights, 2010) at 9.
[37] V. Ferraris, F. Bosco, and E. D'Angelo, "The Impact of Profiling on Fundamental Rights," Working Paper (Protecting Citizens' Rights Fighting Illicit Profiling, 2013) at 3.
[38] European Agency for Fundamental Rights, 'Preventing Unlawful Profiling Today and in the Future: A Guide' (European Agency for Fundamental Rights 2018) Handbook, 17-18.
[39] ibid 25.

Post-crime profiles, often include psychological features, physical traits, and apparent motivations of the suspect, as well as situational crime opportunities, all based on the known evidence and details of a crime.[40] Though a profile may be particularly effective in correctly identifying a subject, there may be many individuals who fit the profile but have no connection to the crime in question. Though group accuracy may be generally accurate, at the individual or sub-group level there is a much higher margin of error.[41] This is one reason why profiling of a group based on a single shared characteristic may be generally unlawful in practice. Similarly, the perpetuation of stereotypes or the ability for a stereotype to tarnish a profile is always present.[42] No one trait within a profile, such as race, may form the sole basis for a police stop,[43] however the collection of traits which may include such characteristics if relevant may be together assessed.[44] The incorrect focus on a single trait, namely when it includes race, gender, or any other protected characteristic, in the absence of reasonable justification, indicates discrimination and unlawful profiling. Racial profiling, a common form of discrimination, is profiling that targets "individuals for suspicion of crime based on the individual's race, ethnicity, religion or national origin."[45] Though any of these characteristics are valid components of a

[40] European Commission against Racism and Intolerance, Combating Racism and Discrimination in Policing, ECRI General Policy Recommendation No. 11, (2007) <https://rm.coe.int/ecri-general-policy-recommendation-no-11-key-topics-combating-racism-a/16808b7639>
[41] Zuzanna Warso, 'Human Rights Requirements for Person-Based Predictive Policing, Lessons from Selected ECtHR Case Law and Its Limits' [2022] Technology and Regulation 71, 79.
[42] European Agency for Fundamental Rights, "Understanding and Preventing Discriminatory Ethnic Profiling: A Guide" at 59.
[43] As in the case of race, when used lawfully as a part of a profile, it still may not constitute the basis for a stop along. *See* Ric Simmons, "Quantifying Criminal Procedure: How to Unlock the Potential of Big Data in Our Criminal Justice System," *Michigan State Law Review*, 2016, 947–1017 at 971-972. In the U.S., the Equal Protection Clause stipulates that for race to be considered at all, it must be a necessary and narrowly tailored use which achieves a compelling state interest.
[44] European Agency for Fundamental Rights at 17, 59. Direct discrimination on grounds of race, ethnicity or religion is never justified by law according to Article 4(1) of the International Covenant on Civil and Political Rights.
[45] "Racial Profiling: Definition" (American Civil Liberties Union, 2021), https://www.aclu.org/other/racial-profiling-definition.

criminal profile, these traits alone are not sufficient justification for identifying an individual as relevant to a criminal investigation.

2. Predictive profiling

Theoretically, profiles may be viewed as a very powerful tool for anticipating crime.[46] Predictive, or anticipatory profiling, is the correlation of known characteristics of prior crimes as compared against current data to find similar correlations in the present. This will theoretically lead police to places or individuals with "attributes that correlate with a higher chance of displaying criminal behavior."[47] It allows for the "monitor[ing] or target[ing] on the forehand," in order to hinder or deter future crimes. This may be referred to as "inductive profiling" or algorithmic profiling,[48] and is defined as profiling that is "based on the use of data stored in databases and information technology systems…us[ing] different techniques to profile people based on correlations and patterns in data." [49] However it is argued herein that algorithmic, or predictive profiling may in practice raise a host of legal issues as regards fairness and discrimination in a disproportionate contrast to effectiveness.

There are many obvious routes to discrimination when relying upon algorithmic profiling to predict crime and direct policing.[50] Because predictive profiles are built through the "automation, scale of analysis, and predictive capacity" of the predictive technology, any biases

[46] *Supra Note* 75-78 (Ch 1).
[47] Sabine Gless, "Automated Suspicion - and Evidence?" (Facial recognition vs. Criminal Justice, Council of Europe AI & Law Webinar Series, online, February 2, 2021), https://www.coe.int/en/web/artificial-intelligence/-/ai-law-webinar-9-facial-recognition-vs-criminal-justice?fbclid=IwAR3Y-uYro9TEcar-qr1sJAMJUaThTv9Izhs5L9oNSitOIVaFJuR4Z5sE5Jw.
[48] Meijer and Wessels, "Predictive Policing: Review of Benefits and Drawbacks" at 1034.
[49] European Agency for Fundamental Rights, "Preventing Unlawful Profiling Today and in the Future: A Guide," Handbook (European Agency for Fundamental Rights, 2018) at 19.
[50] *Filippo Raso*.

contained therein will also form a part of the profile.[51] As many of these biases may be hidden to the police officer, profiling conducted in good faith may still perpetuate stereotypes by proxy and promote the over- or under-policing of particular communities.[52] Due to feature selection[53] and the generation of proxy data, risk assessments may cause the targeting of whole neighborhoods and as a result, membership in a community may become a characteristic in a profile.[54] Predictive profiling may also demonstrate the harm of statistical bias in risk assessments. As has been discussed in regard to other fundamental rights, a profile predicts nothing about its subject as individuals nor includes adequate context,[55] and accurately identifies only the cases that fall directly on the identified regression.[56] As a result of statistical pooling, profiling may treat particular subsets of a population disproportionally to the full population.[57]

Indirect discrimination is also a likely effect of predictive profiling. Though profiling places for a likelihood of crime does not directly implicate individuals, the effects are similar. If a crime profiled was not based on the perpetrator but instead the place where it occurred, this will be relevant to the risk score for a particular neighborhood at particular times of day, in other

[51] Id. at 34.
[52] A dynamic algorithm refers to one which may update its model according to new correlations among data according to a machine learning capability. *See* European Agency for Fundamental Rights, "Preventing Unlawful Profiling Today and in the Future: A Guide" at 109. *See also* Simmons, "Quantifying Criminal Procedure: How to Unlock the Potential of Big Data in Our Criminal Justice System" at 975.
[53] E.L. van Kooten, "Predictive Policing; an Investigation into the Use of the Crime Anticipation System by the Amsterdam Police Department and the Safeguard against Discrimination" (Tilburg Law School, 2018).
[54] *See* Directive (EU) 2016/680 of the European Parliament and of the Council of 27 April 2016 on the protection of natural persons with regard to the processing of personal data by competent authorities for the purposes of the prevention, investigation, detection or prosecution of criminal offences or the execution of criminal penalties, and on the free movement of such data.
[55] Simmons, "Quantifying Criminal Procedure: How to Unlock the Potential of Big Data in Our Criminal Justice System" at 984.
[56] Dirk Brand, "Algorithmic Decision-Making and the Law," *EJournal of EDemocracy* 12, no. 1 (2020): 115–32 at 123. Also Mendola, "One Step Further in the 'Surveillance Society': The Case of Predictive Policing." For a discussion on linear discussion, *see also* University of Helsinki and Reaktor, "Elements of AI, How Should We Define AI?"
[57] O.J. Gstrein, A. Bunnik, and A. Zwitter, "Ethical, Legal and Social Challenges of Predictive Policing," *Catolica Law Review* 3, no. 3 (2019): 77–98 at 89.

words, a generic behavioral profile may be produced.[58] For instance, if police stop men who are out in the neighborhood at these times, and the neighborhood is home predominantly to working class immigrants, it may be immigrant men working long hours and therefore of a particular socio-economic class, who bear the focus of this scrutiny despite the locations informing the core of the profile. Therefore even in the absence of overt discrimination or proxy discrimination of individuals, facially neutral profiles may disproportionally affect certain groups and perpetuate over-policing and increasingly disproportionate use of arrests, further distorting the data.[59]

D. Protections Against Discrimination

Discussed above, a legal implication of profiling, particularly profiling which is predictive in nature, is that it easily precipitates discriminatory acts, even if unintentionally. This thesis addresses biases that may stem from either, or both human or machine processes, as delineated above. However this section of the chapter aims to put into legal terms the way in which these biases, when implemented within the actions of state authorities such as the police, result in discriminatory acts in legal terms. It is the aim of this section to demonstrate that discrimination, however legally defined in the varying jurisdictions, is the likely result of using predictive programs as in the case of predictive policing. The use of 'accurate' statistical analyses may often result in a mismatch between reality flattened into numbers and translating those values back into the real world. Here is discussed biases contained within numerical values and their extrapolation into police action.

[58] *See* Andrew Guthrie Ferguson, "Predictive Policing and Reasonable Suspicion," *Emory Law Journal* 62, no. 259 (2012): 261–325 at 296.
[59] Molly Griffard, "A Bias-Free Predictive Policing Tool?: An Evaluation of the NYPD's Patternizer," *Fordham Urban Law Journal* 47, no. 1 (2019): 43–84 at 52.

Discrimination is expressly prohibited in most constitutional doctrines, as well as international or regional legal instruments. From these legal instruments, judicial interpretation and legislative implementation define the bounds of the prohibition. This sub-section will give the legal framework for determining unlawful discrimination in policing in the chosen jurisdictions to illustrate that compared with traditional policing the use of predictive policing is a greater multiplier of actual and legal harm. Though the anti-discrimination framework clearly applies to predictive policing, little jurisprudence directly assessing its use exists, making this a comparative analysis both within and across jurisdictions. Finally, it will be suggested that in addition to the human biases which are generally the focus of anti-discrimination challenges, additional forms of bias proliferate predictive policing which may increase discriminatory policing and are unaccounted for in the jurisprudence.

1. Case of European Convention on Human Rights

Article 14 of the European Convention on Human Rights (ECHR) expressly states that "The enjoyment of the rights and freedoms set forth in [the] Convention shall be secured without discrimination on any ground such as sex, race, colour, language, religion, political or other opinion, national or social origin, association with a national minority, property, birth or other status."[60] When there is an alleged infringement of this right, it must first be established that it causes an interference on the modality or enjoyment of a right provided in the Convention.[61] The thesis has argued that the use of predictive policing may implicate the right to a fair trial, according to Article 6 (discussed in reference to the presumption of innocence in Chapter 3; as

[60] European Convention on Human Rights, Article 14.
[61] Lady Hale, "Equality and Human Rights" (lecture, Oxford Equality Lecture 2018, Law Faculty at the University of Oxford, October 29, 2018).

well as right to liberty and security of the person, Article 5, discussed in Chapter 4).[62] This analysis will address the Court's treatment of Article 14 to show that the aforementioned violations are frequently in conjunction with an act of discrimination. Following a review of the relevant case law on interpreting the right, it will be applied to predictive policing to ascertain the limits of the Article 14 protection. In concluding, the previously discussed Artificial Intelligence Act (AIA) will be explored as a potential, additional protection against discrimination as propelled by biases contained within the machinery of AI and risk assessments.

The first fact necessary to demonstrate discrimination is that the claimant was in fact treated differently from others similarly situated, based on one of the characteristics denoted in the ECHR.[63] For instance, treatment that may correlate to a protected characteristic must also be the reason for which the differential treatment occurred.[64] In the case of *Aghdgomelashivili and Japaridze v. Georgia*, the Court held that the discovery of a personal characteristic, such as sexual orientation, when apparently provoking unnecessary aggression by the police is a clear violation of anti-discrimination in the course of an investigation.[65] It has similarly held overt uses of racial slurs and hate speech toward an individual based on a believed association to a particular group by police amount to a clear showing of discriminatory policing.[66] Where police may automatically "connect[ ] ethnicity to criminal behavior…" it may be considered as "ethnic

[62] The Council of Europe in a study on algorithms and human rights found that "the mere potential of [algorithms] use raises serious concerns with regard to Article 6 of the ECHR and the principle of equality of arms and adversarial proceedings as established by the European Court of Human Rights." See, Alexander Babuta, Marion Oswald, and Christine Rinik, "Machine Learning Algorithms and Police Decision-Making; Legal, Ethical and Regulatory Challenges" (Royal United Services Institute for Defence and Security Studies, September 2018), https://rusi.org/sites/default/files/201809_whr_3-18_machine_learning_algorithms.pdf.pdf. at 20
[63] *Yorkshire Building Society v. the United Kingdom,* App. nos. 21319/93, 21449/93 and 21675/93.
[64] *Molla Sali v. Greece* [GC], 2018, para. 133; *Fabian v. Hungary* [GC], 2017, para 113; *Clift v. the United Kingdom*, 2010, para 66.
[65] *Aghdgomelashivili and Japaridze v. Georgia*, no. 7224/11 ECtHR (8 October 2020). *See also, Lingurar v. Romania*, no. 48474/14, ECtHR (2019).
[66] *Skorjanec v. Croatia*, no. 25536/14, ECtHR (2017).

profiling" or "institutionalized racism."[67] Therefore it is not necessary that the individual in a comparable situation shares identical characteristics, but even the believed association with others holding those characteristics as a basis for police action may amount to a form of discrimination. The Court has also held a finding of discrimination by authorities in the case of indirect or unintentional differentiation between groups. In *Biao v. Denmark*, the Court held that when a particular state policy includes the distinguishing of individual based on national grounds, it is likely to be foreseen that persons of certain ethnic origins may be more likely to be disadvantaged than others similarly situated.[68]

Having determined that differential treatment has occurred, the next step in determining the lawfulness of the act requires a determination as to whether the action was objective and reasonably justified. In general, the Court will balance the interests of the community with that of the individual claimant in what may be called a "proportionality test."[69] The first step in making this determination is finding a legitimate aim for the measure.

> "On this question the Court…holds that the principle of equality of treatment is violated if the distinction has no objective and reasonable justification. The existence of such a justification must be assessed in relation to the aim and effects of the measure under consideration, regard being had to the principles which normally prevail in democratic societies. A difference of treatment in the exercise of a right laid down in the Convention must not only pursue a legitimate aim: Article 14 (art. 14) is likewise violated when it is clearly established that there is no reasonable relationship of proportionality between the means employed and the aim sought to be realised."[70]

[67] *Lingurar v. Romania*, judgment of 16 April 2019, no. 48474/14.
[68] *Biao v. Denmark*, no. 38590/10, ECtHR (22 December 2009).
[69] European Court of Human Rights (n 40) at 18. Also, Belgian linguistic case, 1968, para 10.
[70] *Case "Relating to Certain Aspects of the Laws on the Use of Languages in Education in Belgium*" (Merits) App. Nos. 1474/62 1677/62 1691/62, 1769/63, 1994/62, 2126/64 at I.B.10.

In order to prove that the aim is legitimate, the Court will assess whether there is an "objective and reasonable justification" for the discriminatory action. The justification must be consistent with principles "which normally prevail in democratic societies." Conversely, a lack of legitimate aim may be found when there is no "reasonable relationship of proportionality between the means employed and the aim sought to be realized."[71] In addition, the Court has held that if an aim may risk the differential treatment to individual groups by virtue of the practice, it may be legitimate only if proper procedural safeguards are implemented throughout the process.[72]

The second element of the test for objective and reasonably justified is a test for proportionality, in which the Court weighs the interests of the community against those vested in individual rights. One manner of making this determination is to first assess whether the act of discrimination is "necessary in a democratic society."[73] As previously asserted, the pursuit of public safety via the profiling and apprehension of known criminals is a critical and necessary means of criminal law enforcement. The question implicated herein, is whether the method of predictive profiling is also necessary.

In answering whether an act responds to a "pressing social need" the Court has previously held that the collection and retention of information by police is a necessary prerequisite to the extraction of intelligence for actionable use when circumscribed appropriately.[74] In the *Case of S. and Marper v. The United Kingdom*, the Court did not question the importance of information

[71] *Case of Unal Tekeli v. Turkey*, App. no. 29865/96, Para. 50. Citing, *Petrovic v. Austria*, judgment of 27 March 1998, *Reports of Judgments and Decisions* 1998-II, para. 30; and *Lithgow and Others v. the United Kingdom*, judgment of 8 July 1986, Series A no. 102, para. 177.
[72] (Oršuš and Others v. Croatia [GC], 2010, para 157
[73] *Case "Relating to Certain Aspects of the Laws on the Use of Languages in Education in Belgium"* (Merits) App. Nos. 1474/62 1677/62 1691/62, 1769/63, 1994/62, 2126/64 at I.B.10.
[74] *Case of Catt v. United Kingdom,* App. no.45314/15, para. 119-128.

in the detection of crime when regarding the collection of DNA samples, but instead made its determination of legitimacy by "delimit[ing] the scope" of the data collected. Further, the Court has frequently held that a national authority may be best suited to determine the particular needs of a community and that

> "The breadth of this margin varies and depends on a number of factors including the nature of the Convention right in issue, its importance for the individual, the nature of the interference and the object pursued by the interference. The margin will tend to be narrower where the right at stake is crucial to the individual's effective enjoyment of intimate or key rights."[75]

It is therefore for the state to determine the scope of reasonable and non-excessive use, within the ambit of the ECHR.

The second prong to the test requires that the means for pursuing an aim must be proportionate to the result. That is, the potential infringement to individual rights does not outweigh the benefit to the community. In *Tele2 Sverige AB v. Watson and Others*, the Court held that

> "the objective pursued […] must be proportionate to the seriousness of the interference in fundamental rights that access entails, it follows that, in the area of prevention, investigation, detection and prosecution of criminal offences, only the objective of fighting serious crime is capable of justifying such access to the retained data."[76]

Though the Court was referring to a far more intrusive collection and use of data, the sliding scale of appropriateness for police data collection is clear. Where the intrusiveness of a mosaic of data may allow police to piece together the details of an individual's life, it may be asserted that the ability to discriminate increases.

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[75] *Case of S. and Marper v. The United Kingdom*, No. App 30562/04 and 30566/04 (European Court of Human Rights December 4, 2008), para. 102.
[76] *Tele2 Sverige AB v Post- och telestyrelsen and Secretary of State for the Home Department v Tom Watson and Others*, App. no. C-203/15 and C-698/15.

In assessing the use of predictive policing as predicating a potential brief deprivation of liberty, the Court will first look to the use of the practice to determine its objective, reasonable aim. Herein, the analysis considers a brief deprivation of liberty to be a police stop, in the course of a patrol that is based on a risk assessment. A typical criticism of predictive policing is that predictive software do not treat individuals or groups alike and racial bias becomes automated.[77] Members of particular ethnic communities, or those living in particular neighborhoods are more frequently the targets of predictive patrols. The justification for unequal treatment comes from a reliance on technology perceived as objective, in support of the assumption that results will also be objective. The reduction of crime data into factual, discrete packets of information could in an ideal situation provide objective justification for the use of predictive profiling.[78] As crime is perpetrated not by all but by some, the use of police records will necessarily treat individuals differently. It then would follow that the use of historic crime data may be considered to apply to all equally, the difference being that individuals' police records are unique. [79]

However for this argument to be considered valid, it must be shown that proper safeguards to ensuring accurate recordkeeping are in place, so as to ensure that a proper use of the data will not include error.[80] In the case of predictive policing this thesis argues that these safeguards are absent or alternatively, improperly applied in practice.[81] It further asserts that police and crime

[77] Amnesty International, "Trapped in the Matrix: Secrecy, Stigma, and Bias in the Met's Gangs Database." *See also, Supra Note* 41.
[78] In contrast, see *Case of Paraskeva Todorova v. Bulgaria*, App. no. 37193/07, para. 35-46, in which the Court held that the non-suspension of a sentence for the purpose of deterrence was not appropriate when the court of first instance did not decline to consider the ethnicity of the applicant but instead included it as additional justification for its decision.
[79] *See also Case of S. and Marper v. The United Kingdom*, No. App 30562/04 and 30566/04 (European Court of Human Rights December 4, 2008), para.128, in which the Court holds that a conviction or acquittal are not considered status per Article 14 but instead a historical fact.
[80] *Case of Orsus and Others v. Croatia*, App. no. 15766/03, para. 157. *Also, Buckley v. United Kingdom*, App. no. 20348/92, para. 76.
[81] Lum and Koper, *Evidence-Based Policing; Translating Research into Practice*. Claire Garvie, "The Perpetual Line-Up - Unregulated Police Face Recognition in America" (Georgetown Law Center on Privacy & Technology,

records are significantly flawed and inconsistently collected or maintained. This is particularly true across various predictive technologies and exacerbated by the numerous forms of bias that may affect the output of a program in ways unseen to a police officer. It has been found that there are four main categories of imperfect information that affect the accuracy of crime predictions: 1) Uneven reporting of crimes; 2) Skewed perceptions of crime levels and police presence; 3) Unequal policing which skews crime statistics; and 4) Differences in recording rules across jurisdictions.[82] As a result of the lack of safeguards against data biases, error, and subjectivity, despite a facially legitimate aim, the first criteria to a finding of "objective and reason[ably] justify[fied]" may be difficult to establish.[83]

Next, the Court will assess whether predictive policing addresses a pressing social need. The prevention of crime is undoubtedly an important and necessary objective to be fulfilled by the state. However the effectiveness of predictive profiling is very difficult to assess and due to a lack of causality between predictive policing and the occurrence or absence of crime, it is not a reliable indicator of necessity. Many officers who have been interviewed on the use of the technology state that it tells them what they already know and/or pushes them to over-police particular areas.[84] A traditional patrol is undoubtedly necessary to prevent crime as it is an effective form of crime control. In addition to the lack of clear benefit to officers using the predictive technology, it is near impossible to distinguish causality from correlation. Even where

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October 18, 2016); Rashida Richardson, Jason Schultz, and Kate Crawford, "Dirty Data, Bad Predictions: How Civil Rights Violations Impact Police Data, Predictive Policing Systems, and Justice," *New York University Law Review* 94 (May 2019): 192–233.

[82] The fourth component is much less acute in England and Wales jurisdictions, but noted. David Buil-Gil, Angelo Moretti, and Samuel Langton, "The Integrity of Crime Statistics: Assessing the Impact of Police Data Bias on Crime Mapping" (Campion Grant of the Manchester Statistical Society, June 25, 2020), https://doi.org/10.31235/osf.io/myfhp. at 4-5.

[83] *Supra Note* 70.

[84] Ajay Sandhu and Peter Fussey, "The 'Uberization of Policing'? How Police Negotiate and Operationalise Predictive Policing Technology," *Policing and Society*, August 4, 2020 at 10-12.

crime rates may decrease with the implementation of predictive policing, and this is not universal, it cannot be conclusively shown why a crime did not occur. The analysis must also account for the fact that the means include the consequences of pursuing false positives as the result of automated biases built into predictive policing tools. The Alan Turing Institute issued an Ethics Advisory Report in 2017 on the National Data Analytics Solution in the U.K. and found that autonomy is compromised when individuals may be subjected to police surveillance with conditions prior to any criminal offense.[85] In sweeping data collection it may be persuasively argued that this constitutes a form of police surveillance and may even implicate other fundamental rights, such as Article 8 of the ECHR.

Finally, it is necessary to ascertain whether the use of predictive policing may be considered proportionate to the aims when accounting for the potential adverse human effects. As discussed in the prior section, criminal profiling is a legitimate tool for criminal investigations.[86] When properly exercised the use of a criminal profile may aid police in decision making processes that should allow the apprehension of a suspect of a crime in order to ensure public safety as well as uphold the rule of law.[87] The move toward more preventative policing measures further propels this goal, at least in theory, by enhancing public safety by deterring crime before it can even occur, therefore minimizing the number of victims of crime. The adoption of predictive policing was intended to further streamline, professionalize, and make impartial the act of policing through the use of technology.[88] On its face this is a reasonable justification for the use of predictive

[85] The Alan Turing Institute, "Ethics Advisory Report for West Midlands Police," Independent Digital Ethics Panel for Policing (The Alan Turing Institute, July 28, 2017).
[86] Newburn, "Understanding Investigation."
[87] In the German state of Hesse, the Constitutional Court when offered the argument that predictive policing, which uses data to create a profile of suspects prior to the commission of a crime, was unconstitutional in that it falls short of the threshold of an 'identifiable danger.' "German Constitutional Court Strikes down Predictive Algorithms for Policing," news, *Euractiv*, February 2023, https://www.euractiv.com/section/artificial-intelligence/news/german-constitutional-court-strikes-down-predictive-algorithms-for-policing/.
[88] Rosenthal at 81.

technology, well within the competence of the police. However it must be established that the safeguards currently in place are scant and the cost to the community versus the benefits may not be seen as proportionate.

Looking to previous tests of the ECtHR on discrimination in policing as well as the sophisticated use of technology to create criminal profiles, it appears likely that the Court will not find it necessary or proportionate to use predictive policing and that the potential discrimination in policing will outweigh the benefits of its use. Should the Court additionally consider the further uncertainties present in the form of machine and statistical biases, it may be argued that the accuracy of data is only a small component of problems inherent with the 'black box.' It is therefore argued here that the ECHR framework for the right against discrimination would disallow the use of predictive policing.

2. The Netherlands

Predictive policing in the Netherlands is included here as it is one of the European countries most known for its predictive policing, yet it is also subject to the ECHR and European Union legal instruments. It therefore presents a unique hybrid of the systems while also being the subject of many criticisms regarding biases and discriminatory policing. However despite the relative widespread use of predictive policing in the Netherlands, it is argued herein that a legal challenge to its use is likely to be successful. This sub-section focuses on discrimination, though the parallels and tensions with data protection will also be raised at the end of this chapter as the Netherlands has implemented the EU data protection framework.

There are several predictive policing programs that have been trialed in the Netherlands, the most well-known being the Crime Anticipation System (CAS). Unlike many of the predictive

policing programs used in the U.S., this program was developed by and continues to be maintained by the police.[89] This system was first run as a pilot in Amsterdam and several other cities in 2012 and has since been accepted as a formal program of the Dutch National Police Corps (KLPD), which was unified in 2013. This is notable as it is the first predictive policing program in the world to be used at a national level and is currently used by 110 of 167 base teams. CAS automatically refreshes and retrains bi-weekly.[90] As a result, its use of crime data is centralized (Central Crime Database, BVI) and does not pose problems of information sharing across jurisdictions. In addition, it utilizes data from two other repositories; the Municipal Administration (GBA) and Central Bureau of Statistics (CBS).[91] These data include socioeconomic and demographic information as well as the distribution of social benefits allocated within an area. It is important to note that with the exception of the BVI, the data provided by these databases are not collected for the purpose of policing but instead for monitoring socio-economic trends in the Netherlands causing a gap between the purpose of collection and eventual use.[92]

Predictive policing in the Netherlands follows a long history of using data and predictive measures to identify potential violators of law, namely in the case of welfare fraud. The use of AI and predictive enforcement in social welfare cases is offered here as 1) a parallel enforcement scheme; 2) reflective of many of the same flaws or rights violations; and 3) providing an example of how Dutch courts may treat predictive policing, based on comparable legal

[89] Serena Oosterloo, 'Predicting Crime through Data: Analysis of the Data Assemblage of the Dutch Crime Anticipation System' (Utrecht University 2020), 17.
[90] Paul Mutsaers and Tom van Nuenen, 'Predictively Policed: The Dutch CAS Case and Its Forerunners', *Policing Differences: Perspectives from Europe* (Manchester University Press forthcoming), 7.
[91] Serena Oosterloo and Gerwin van Schie, 'The Politics and Biases of the "Crime Anticipation System" of the Dutch Police', *Proceedings of the International Workshop on Bias in Information, Algorithms, and Systems*, vol 2103 (2018), 33.
[92] Oosterloo (n 93), 25.

challenges. In 2003 a cooperation between multiple government entities, including the police and Ministry of Social Affairs and Employment established the *Landelijke Stuurgroep Interventieteams* (LSI). The objective for this project was to identify sources of fraud and enact greater controls against such violations. In multiple sub-projects there was found to be not only a low threshold of success but also numerous allegations of discriminatory results. Due to the nature of the fraud being investigated, the program was aimed at low-income neighborhoods and families, which are more likely to be the recipients of social benefits, causing a disproportionate cost to those individuals and communities. Numerous of those programs were later condensed into the coherent program named SyRI, discussed below.[93]

The Dutch data protection framework to which predictive policing is subject, allows for particular uses of police data.[94] Most relevant to this discussion are the Personal Data Act and Police Data Act, which require that data minimization practices are utilized to ensure that data is not processed beyond what is necessary and for a specific purpose. The Personal Data Act further requires that data cannot be stored for any longer than is necessary and that no more identifiable information may be retained than is necessary.[95] Given adequate conditions, police may compare or share information with other entities when processed for a particular investigatory purpose. The Police Data Act requires that such a comparison 1) must be necessary

[93] Amicus Curiae from Philip Alston, 'Brief by the United Nations Special Rapporteur on Extreme Poverty and Human Rights as Amicus Curiae in the Case of NJCM c.s./De Staat Der Nderlanden (SyRI) before the District Court of The Hague (Case Number: C/09/550982/ HA ZA 18/388)' (26 September 2019)2-5.
[94] Specific regulations on police uses of 'big data' include Wet bescherming persoonsgegevens; Wet politiegegevens; Wet op de inlichtingen – en veiligheidsdiensten; and Wet justitiele en strafvordelijke gegevens. See EL van Kooten, 'Predictive Policing; an Investigation into the Use of the Crime Anticipation System by the Amsterdam Police Department and the Safeguard against Discrimination' (Tilburg Law School 2018), 11-12.
[95] Personal Data Act, Article 10, paragraph 1.

and 2) it must be police data,[96] defined as any personal data processed by police for police purposes.[97]

In addition to questions as to the processing of data collected for other purposes, is that of automated decision making and human intervention in the predictive policing process. The CAS program is purportedly designed specifically to require the intervention of a human, as the output of the system is so vague and provides minimal information about risks, that it requires a human to interpret the prediction and "qualify" it for policing uses.[98] Though protected characteristics such as gender or ethnicity are not explicitly used in CAS predictions, as has been discussed at length, the combination of countless other data act as proxy for those exact characteristics. There is also reason to suggest that other data are designed to stand in for certain protected categories. In 2017 the category of *allochthone* and *autochthone*, which identifies those citizens who are of non-Western heritage, was removed from the CAS program, due to its cited lack of predictive value, rather than its potentially discriminatory effect. This highlights some of the flaws of the application of predictive policing in the Netherlands, due to its discriminatory potential. Indeed some critics have suggested that removing the *allo/auto* category from CAS only confirms that proxies act to fulfill the same characteristic, therefore making it unnecessary to include.

Though person-based predictions are less the focus of this work than place-based, it is notable that in Amsterdam there exists a program targeting 'at risk' children, "Top600," comparable to the London Gangs Matrix or Chicago Heat List.[99] This program identifies juveniles profiled to be at risk for recidivism or a first time offense. Though race is not a factor

[96] Articles 8 and 9, Police Data Act.
[97] Article 1 Police Data Act.
[98] ibid, 29.
[99] Peter Yeung, "The Grim Reality of Life under Gangs Matrix, London's Controversial Predictive Policing Tool," *Wired*, April 2, 2019; Vikram Dodd, "Met Removes Hundreds from Gangs Matrix after Breaking Data Laws," *The Guardian*, February 15, 2020; ACLU of Illinois, "Stop and Frisk in Chicago" (American Civil Liberties Union, March 2015), https://www.aclu-il.org/en/publications/2015-stop-and-frisk-report.

used in the profile, it has been documented that at least one point, all members of the target list were ethnic minorities, demonstrating the use of proxy data as highly racialized. This also illustrates the importance of police discretion as contained in data and prior arrest records. Similarly, 'The Sensing Project', a person-based predictive program piloted in Roermond, is used for predicting "mobile banditry." This category of crime is a form of property theft in known shopping districts, perpetuated by individuals frequently identified by the police as 'Romani' individuals.[100] The profile used by police varies between objectively suspicious behavior, such as the suspect drives a car, accompanied by others, according to a specific, repeated route. However the profile then begins to center on a particular category of persons, as it further includes that the car has a Romanian or German license plate and may be a "white rental car" originated in Germany which is apparently three to five years old and small in size.[101]

Discrimination has been the subject of many human rights concerns as regards the use of predictive policing in the Netherlands. Looking at The Sensing Project it is very easy to pinpoint the use of algorithmic profiling, based on mass, indiscriminate surveillance. Not only does this ignore the building of suspicion, discussed in Chapter 4, but it also relies upon a discriminatory profile. While the ethnicity of individuals is not a part of the formal profile, the crime of mobile banditry alone may be considered problematic. This profile does not seek to locate shoplifters or pickpockets, but instead focuses only on a particular subcategory of those exact crimes, as seen as being perpetuated by a particular group. The term 'mobile' refers not only to an implicit (or sometimes explicit) assumption by police, but *de facto* excludes Dutch citizens. In the four year

[100] Juliana Senra, "Innocent Until AI Says Otherwise. How Predictive Policing in the Netherlands Raises Concerns for Human Rights," *The Perspective Magazine*, 2021, https://issuu.com/theperspectivemagazine/docs/issuu_tp_war-over-reality_1_2021/s/11646233.
[101] "We Sense Trouble; Automated Discrimination and Mass Surveillance in Predictive Policing in the Netherlands" (Amnesty International, 2020).

period up to 2014, the police identified 1,854 shoplifting suspects; of which 1,106 were Dutch and only 313 met the criteria for mobile banditry.[102] It is clear that the criteria of necessary and proportionate do not seem to be met, as neither the success rate nor the adherence to the profile for 'mobile bandit' are proportionate to the cost to monitored individuals, or effective enough to be considered necessary.

Returning to the issue of proxy data as used for place-based predictions such as by CAS, it has been demonstrated that the use of demographic data similarly perpetuates discriminatory policing. For instance, the use of socio-economic information allows single parent homes to be identified as implicated by combined demographic and socioeconomic data. This perpetuates disproportionate adversity for low income neighborhoods who may be targeted by over-policing as a result.[103] As single-parent families are considered to be a risk factor for children, this information may inform a police officer's judgement for a program such as Top600. Similarly, low-income neighborhoods are also more likely to be home to ethnic minority groups or immigrant communities, further building a proxy profile. As low-income neighborhoods increasingly become the subject of predictive policing controls, they will continue to be over-policed as a result of the feedback loop and disproportionately arrested, triggering confirmation bias.

The Dutch legal system has not yet entertained a case specifically on the use of predictive policing, but there are parallel cases which may be informative as to the approach courts may take. In 2020, the Hague District Court heard a case in which the appellant claimed that the system used to predict welfare fraud, System Risk Indication (SyRI) was disproportionately targeting specific groups of people for scrutiny over suspected fraud, without actually proving

[102] ibid, 38.
[103] Oosterloo and van Schie, "The Politics and Biases of the 'Crime Anticipation System' of the Dutch Police."

many cases relative to the number of identified suspects.[104] The Court found that because the program could not be verified as an accurate predictor of fraud, nor did it provide appropriate protections, it was unlikely to meet the requirements for necessary and proportionate.[105] It therefore ruled that the program was in violation of Article 8, paragraph 2 of the ECHR due to a lack of adequate privacy safeguards.[106] In addition to violations of the ECHR, which will be discussed below, discrimination by public officials is prohibited by Article 1 of the Dutch Constitution.

The Court has held that the use of technology must be reasonable and proportionately fit for its intended purpose, which must also be legitimate under law.[107] In another parallel example of caselaw building on the Dutch jurisprudence of technology and policing, the Supreme Court found that the compiling of data from an individual's cell phone for the purpose of a police investigation was an intrusion on the right to privacy as the data when combined provided an intimate view of the individual's life beyond that which was necessary.[108] When the search is systemized, as in automated data collection in the case of a criminal investigation, the intrusion on privacy is great enough as to warrant an authorization or a specific legal basis.[109] This form of systematic data collection may be considered as parallel to predictive policing data collection wherein numerous categories of data are collected near indiscriminately, in an automated and systematic way. Yet in the case of predictive policing in which predictions are speculative and no

[104] NJCM c.s./De Staat der Nederlanden (SyRI), District Court of the Hague, no. C/09/550982/ HA ZA 18/388 (6 February 2020).
[105] Maranke Wieringa, "'Hey SyRI, Tell Me about Algorithmic Accountability': Lessons from a Landmark Case," *Data & Policy* 5, no. 2 (December 2022).
[106] Tamara van Ark, "Letter of 23 April 2020 to the President of the House of Representatives by the State Secretary for Social Affairs and Employment, Tamara van Ark, on a Court Judgment Regarding SyRI," Official Letter, April 23, 2020.
[107] Zwolsman Judgement, ECLI:NL:HR:1995:ZD0328, Supreme Court (19 December 1995).
[108] ECLI:NL:HR:2014:1563, Supreme Court of the Netherlands, 1 July 2014, *NJ* 2015.
[109] Article 3, Police Data Act.

crime has been committed, the program is arguably less justifiable as necessary and therefore less proportionate to the intrusion.[110]

Just as in other jurisdictions, Dutch courts have not yet assessed challenges to predictive policing and there remain clear and problematic aspects to it ongoing use. CAS reportedly changed the term 'known offenders' to 'suspects' in 2017. According to the CBS, 'suspect' refers to persons who "a reasonable suspicion of guilt to a criminal offense is assumed through facts and circumstances."[111] From a legal standpoint this has implications dependent on what the category actually refers, how that suspicion is built, and how those individuals may be treated in terms of due process. As in the example of ambiguity over defining high crime areas, there is little clarity as to the terms and process used. In addition, applying the decision over the use of SyRI to predictive policing, it may be found that safeguards against machine or statistical bias are inconclusive, if even existing. Therefore while the Netherlands must meet the standards as set forth by the ECHR and the robust EU data protection regime discussed below, the widespread use of predictive policing clearly still presents issues as to fundamental rights.

3. Case of the United Kingdom

Policing practices in the U.K. are consistently found to promote biases and discrimination, which affects the resulting arrest data used by predictive systems.[112] In the case of predictive policing the use of a reasonable grounds stop, based on algorithmic profiling, may mean that automated predictions indicating an area is high crime gives an officer near limitless

[110] Marianne FH Hirsch Ballin and M Gali, 'Digital Investigation Powers and Privacy: Recent ECtHR Case Law and Implications for the Modernisation of the Code of Criminal Procedure' (2021) 2 Boom Strafblad 148, 155-156.
[111] Oosterloo and van Schie, "The Politics and Biases of the 'Crime Anticipation System' of the Dutch Police."
[112] Cabinet Office, *Race Disparity Audit*, October 2017. www.gov.uk/government/publications/race-disparity-audit at 37. *See also* Big Brother Watch, "Bias in Algorithmic Decision-Making (Crime and Justice)."

discretion.[113] Even more notable, it is not required that these stops are documented. At the point which reasonable suspicion is developed, often post-stop and in the course of an interaction, a search may take place and only then it becomes necessary that the interaction is recorded.[114] It follows that crime predictions built on historic data will suggest outcomes reflective of that data and an individual who happens to be in what is a predicted high crime area may be stopped as a result.[115] Though the tools used for predictive policing and the subsequent police actions are applied to a whole population, it is very clear that certain groups are affected much more strictly.[116]

The U.K. as a party to the ECHR and subject to the Article 14 framework, dictates that policing jurisprudence will follow by ECHR standards as described above. As in the Netherlands, there have been no decisions made as to the use of predictive policing as discussed in this thesis, however one notable case provides a parallel that may indicate some of the legal issues that a court would find with its use. In its 2020 analysis of facial recognition technology (FRT) used by police, the Court held in *Bridges v. South Wales Police*, that the appellant's data protection, privacy, and equality rights were all breached as a result of widespread, public surveillance. As in the Dutch example, it found that there were "fundamental deficiencies" in the legal framework and safeguards relevant to the use of FRT and therefore it was not a lawful police practice as being used, and requiring the cessation of the trial period. As the privacy issues are within the right against non-discrimination per Article 14 ECHR already discussed,[117] this

[113] *Big Brother Watch* at 12.
[114] Lara Vomfell and Neil Stewart, "Officer Bias, over-Patrolling and Ethnic Disparities in Stop and Search," *Nature Human Behaviour* 5 (May 2021): 566–75 at 567.
[115] Big Brother Watch, "Bias in Algorithmic Decision-Making (Crime and Justice)" at 7-11.
[116] Jamie Grace, "When, If Ever, Is Predictive Policing Effective, Fair, and Legitimate? What Is the Role of Data Reliability in Law?," *About:Intel* (blog), February 26, 2020, https://aboutintel.eu/predictive-policing-data-reliability/.
[117] Chapter 2, Equality Act of 2010.

section will assess the Equality Act of 2010 of the United Kingdom, which requires certain affirmative duties of the state in order to prevent discrimination.

The Equality Act of 2010 states in its preamble that it is,

> "An Act to make provision to require Ministers of the Crown and others when making strategic decisions about the exercise of their functions to have regard to the desirability of reducing socio-economic inequalities; to reform and harmonise equality law and restate the greater part of the enactments relating to discrimination and harassment related to certain personal characteristics"[118]

In addition, it covers both direct and indirect discrimination:

> "…a difference in treatment may take the form of disproportionately prejudicial effects of a general policy or measure which, though couched in neutral terms, discriminates against a group […] such a situation may amount to 'indirect discrimination', which does not necessarily require a discriminatory intent."[119]

As a potential countermeasure to this outcome, The Equality Act puts a proactive duty on public officials to avoid biased outcomes. Notably, in addition to the prohibition on discrimination, Section 149 of the Act sets out the Public Sector Equality Duty, which requires that public authorities proactively act at the level of the organization to ensure that equality is pursued, in contrast to a negative requirement prohibiting discrimination.[120] This is an important step toward oversight of potentially discriminatory acts by state actors. Courts have held that applying the Duty does not "require the impossible" but does require the "taking of reasonable steps to make enquiries about what may not yet be known to a public authority about the potential impact of a proposed…policy on people with the relevant characteristics."[121] Despite

[118] U.K. Home Office, Equality Act of 2010.
[119] *See, Lithgow v. the United Kingdom*, App. nos. 9006/80, 9262/81, 9263/81,9265/81, 9266/81, 9313/81, 9405/81, para. 177.
[120] Equality and Human Rights Commission, "Public Sector Equality Duty." Updated March 26 2021. <https://www.equalityhumanrights.com/en/advice-and-guidance/public-sector-equality-duty>
[121] *Bridges v. The Chief Constable of South Wales Police*, No. C1/2019/2670 (Court of Appeal (Civil Division) August 11, 2020) para. 179-182.

this, it was reported in 2020, a full nine years after the Gangs Matrix was secretly initiated, that the program was first openly reviewed for lawfulness.[122]

The Equality Duty, applied to public entities, requires that organizations regularly monitor and assess their functions per the requirements set forth in the Equality Act. The Duty is intended to be a means of forcing internal accountability on organizations, by requiring that they regularly, and purposefully, fulfill an evidence based audit of their functions. Through this type of assessment they will then be compelled to identify practices which are not compliant with the duty, therefore putting an active duty upon them to make adjustments to their practice. Enforcing the duty may take many forms, most of which are collaborative and that aim to promote future compliance and avoidance of breaches. However in the most extreme cases, there is a route by which an application may be made to the High Court for judicial review. It is therefore not a measure without enforcement mechanisms, though it still relies on some degree of good faith.[123]

In the context of predictive policing, it should be theoretically necessary to verify the effects and results of the practice before it may be deemed compliant with the Equality Act. In requiring affirmative acknowledgment of practices the goal is to first, identify and cease discriminatory practices; and second, take away the defense of ignorance, insofar as it may be applicable. However implementation of the Equality Act, though necessary to ensuring equal treatment by police, also applies in large part to the internal affairs of police departments.[124] For this reason it may be more likely to find implementation reports produced by policing agencies to focus more

[122] Dodd, "Met Removes Hundreds from Gangs Matrix after Breaking Data Laws."
[123] "The Essential Guide to the Public Sector Equality Duty; England (and Non-Devolved Public Authorities in Scotland and Wales)" (Equality and Human Rights Commission, 2014).
[124] *See*, EQUALITY ACT 2010, Essex Police Department Statutory Duty Information Report 2018 <https://www.essex.police.uk/SysSiteAssets/media/downloads/essex/about-us/equality-and-diversity/essex-police-statutory-duty-information-report-2018.pdf>

on diversity and equality in hiring, for instance, than as an outward facing equality implementation.

This form of enforcement on organizations, which includes police, puts the onus on an organization to internally monitor and have available evidence-based reporting of practices. In so doing, a framework is constructed in which discriminatory practices may be avoided all together. This framework does not confer remedy to those who may suffer a harm, but it may act as an important check on policing policy as a part of a hybrid enforcement structure. In the case of predictive policing this would require that utilized programs are regularly assessed, monitored for error and in full compliance with privacy and data protection laws. Applying the Court's analysis in *Bridges* to predictive policing, parallels in implementation, the indiscriminate use of data, and the inconclusive success of the technology will likely lead to the finding that predictive policing as it exists is lacking in safeguards.

4. Case of the United States

Finally, the legal right against discrimination in the United States is very similar to that outlined above in the case of states bound by the ECHR, but as an inverse application of the right. The analysis applied by American courts which will be applied to predictive policing herein, is not whether a positive right to non-discrimination has been violated, but instead whether the enforcement of law is unequal among individuals. Uneven treatment by police or other authorities is referred to as selective enforcement and applies to acts of state authorities when it may be shown that law is applied selectively, a form of discrimination, without legitimate justification.[125] In a showing of selective enforcement, an individual is considered to

[125] Wayne Beyer, "Police Misconduct: Claims and Defenses Under the Fourteenth Amendment Due Process and Equal Protection Clauses," *The Urban Lawyer* 30, no. 1 (1998): 65–143.

have been denied equal protection of the law as set out in the Equal Protection Clause of the 14th Amendment to the U.S. Constitution. The clause states that "…nor shall any State ... deny to any person within its jurisdiction the equal protection of the laws."[126] An action may be in violation of equal protection if it is predicated on the basis of a "suspect" category: race, religion, national origin, or alienage.[127] For instance, state action predicated on a racial classification is distinguished between that which promotes racial equality, and that which seeks to exploit, or further lessen equality.[128] Where selective enforcement by police on the basis of a suspect classification falls within the reasonable use of discretion, it may be permissible.[129] Police are conferred ample discretion in this regard, an allocation of power that is supported by the legislature through a notable lack of legislation on the matter. However actual policy based upon a suspect classification will almost always be a violation of equal protection.

As the U.S. is a common law system, the guarantee to equal protection has been defined by the Court, and is predominately assessed by either a test of motivation and intent, or a test of effects. This section will first demonstrate that despite similar or even extenuated ill-effects, the use of algorithms for policing does not easily fit an Equal Protection analysis by the Court, specifically one whose analysis relies upon motivation or intent. As a result, plaintiffs are not afforded the remedies that would be available in a case of traditional police patrols, even if the

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[126] 14th Amendment to the Constitution of the United States.

[127] "In determining whether someone deserves to be considered within a suspect classification, a court will look at whether the person is a "discrete and insular minorit[y]." In determining whether someone is a discrete and insular minority (and thus the person's claim deserves strict scrutiny), courts will look at a variety of factors, including but not limited to whether the person has an inherent trait, whether the person has a trait that is highly visible, whether the person is part of a class which has been disadvantaged historically, and whether the person is part of a group that has historically lacked effective representation in the political process." Cornell Law School Legal Information Institute. <https://www.law.cornell.edu/wex/suspect_classification>

[128] U.S. Congress, *Analysis and Interpretation of the U.S. Constitution*, Constitution Annotated (U.S. Library of Congress), Amdt14.S1.4.1.1 Race-Based Classifications: Overview, https://constitution.congress.gov/browse/essay/amdt14-S1-4-1-1/ALDE_00000816/.

[129] Peter Lyle, "Racial Profiling and the Fourth Amendment: Applying the Minority Victim Perspective to Ensure Equal Protection Under the Law," *Boston College Third World Law Journal* 21, no. 2 (May 1, 2001).

harm is the same. It will next address the effects analysis used by courts as well as an extended approach which has been advocated in recent years. Using this extended effects approach, 'effects plus,' the section will apply its use in parallel claims of Equal Protection violations to suggest that predictive policing may also fit this framework and in this way achieve individual remedy under the right of Equal Protection. When over-policing of particular areas is the result, equal protection may be achieved only in "form, and not in substance." As a result, there is a lack of protection afforded to the individuals who may be most at risk of victimization in areas that do not receive a similar level of protection.[130]

Selective enforcement is an official enforcement, or non-enforcement, of law by a state actor, which is "motivated by intentional or purposeful discrimination."[131] There are two ways in which selective enforcement in policing may be viewed as discriminatory policing. The first form of selective enforcement involves police actively discriminating against individuals, such as police pre-textually stopping only individuals of a particular race based on unlawful profiling. This is an active use of selective enforcement of the law. The second interpretation is not one in which police take action in a particularly discriminatory manner against individuals but instead police fail to protect certain individuals or groups from crime, often due to an active prioritization of another group or an apathetic attitude toward a community.[132] The two forms of selective enforcement often work in tandem as a common and unfortunate "confluence of over- and under-enforcement in the same individual and community" which "combines the harshest of punishments with visible inaction."[133]

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[130] Rosenthal at 87.
[131] "Agency Investigations," in *Minnesota Administrative Procedure* (William Mitchell College of Law, 2015).
[132] Lawrence Rosenthal, "Policing and Equal Protection," *Yale Law & Policy Review* 21 (2003): 53–103 at 55; see also See "Racial Profiling: Legal and Constitutional Issues" (United States Congressional Research Service, April 16, 2012) at 4.
[133] Natapoff (n 12) at 1772.

In the most common approach used by courts to determine claims of selective enforcement, a plaintiff must convincingly show that police knowingly acted against him/her both due to a protected classification, and in pursuit of the discriminatory effect.[134] Though intent is a critical element, it has been held that discrimination does not necessarily need to be the result of "ill will, enmity, or hostility,"[135] only that the intent was to enforce the law differently toward members of a particular group, regardless of motivation.[136] Such a direct finding is uncommon due to the reality of implicit biases, and when such evidence is available, it often becomes a matter of proving the word of the plaintiff against that of the police. In the absence of the police officer intonating or otherwise clearly indicating that the purpose behind his/her actions is to achieve a racially motivated result, and as proving an underlying purpose for individual acts is largely prohibitive in practice, some courts have held that motivation based on a protected characteristic such as race need not be the main motivation of the act, but *among* motivations.[137] Therefore when a disproportionate amount of arrests occur in an area, it will be considered "high crime" and police will have a basis for prioritizing it for patrols.[138] Simultaneously, officers can only make arrests in areas in which they are physically present. As a result, an area which is deemed a likely site for crime will self-fulfill this expectation as it will be the location where the most arrests are made. Though a logical direction of police patrol, any biased ideas as to where crimes

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[134] *Washington v. Davis*, 426 U.S. 229 [1976]. *See also*, *Yick Wo v. Hopkins*, 118 U.S. 356, 373-74 (1886), holding that "though the law itself be fair on its face and impartial in appearance, yet, if it is applied an administered by public authority with an evil eye and an unequal hand, so as practically to make unjust and illegal discriminations between persons in similar circumstances, material to their rights, the denial of equal justice is still within the prohibition of the Constitution."

[135] *Ferrill v. Parker Grp., Inc.*, 168 F.3d 468, 473 & n. 7 (11th Cir. 1999).

[136] National Academies of Sciences, Engineering, and Medicine, *Proactive Policing: Effects on Crime and Communities* at 96.

[137] Alyson Grine and Emily Coward, "Recognizing Implicit Bias within the Equal Protection Framework," *Trial Briefs*, April 2017 at 28, *referencing Floyd v. City of New York*, 959 F. Supp. 2d. 540, 662 (S.D.N.Y. 2013) *and Village of Arlington Heights v. Metropolitan Hous. Dev. Corp.*, 429 U.S. 252, 265-66 (1977).

[138] Ferguson, "Crime Mapping and the Fourth Amendment: Redrawing 'High-Crime Areas.'"

are expected or reported creates the 'high crime' label. This is the production of over-enforcement. Conversely, over-policing in one area necessarily leads to the detrimental under-enforcement in others.[139]

Applied to predictive policing, two arguments may be made that it results in selective enforcement. On its face, predictive policing obscures a showing of purpose or intent by altering officer discretion through the use of risk assessments to guide patrols. It is intended to eliminate opportunities for discriminatory policing due to the belief in its impartiality, however as documented and discussed herein, even neutral data frequently act as proxy for characteristics such as race or gender.[140] As recalled from above, police data reflect prior police actions and policy which may bely racially motivated policing or policy further negating perceived neutrality.[141] The use of algorithms and data act as a buffer between police motivation and overt discriminatory behavior. If challenged an officer may even credibly claim that the data which led to a particular prediction were the result of combined records for which she/he is not solely responsible. Further, the Court has held that an officer who acts "in objectively reasonable reliance" on existing police information, even if it turns out to be faulty, he/she will not be held liable for the harm.[142] It is asserted here that predictive policing may allow the datafication of racial motivations, causing discriminatory policing either knowingly or unknowingly as a derivative action. Though the result may be selective enforcement, officer motivation/intent can be easily severed by the use of a risk assessment.

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[139] Natapoff, "Underenforcement."
[140] In fact there are particular algorithms that are designed specifically to make these inferences on the use of a certain characteristic, as simple as name. *See*, Flatow, "How Imperfect Data Leads Us Astray with Kasia Chmielinski."
[141] Lum and Isaac, "To Predict and Serve?"
[142] *Herring v. United States*, 555 U.S.135 (2009) at 6.

An alternative Equal Protection analysis accepts that overwhelming circumstantial evidence may suffice to show that the effect of a policy significantly harms one group over others and therefore must contain some degree of racial animus. Though less commonly used and highly fact dependent, this approach is gaining traction in cases in which a plaintiff cannot articulate a clearly intonated racial motivation.[143] Termed the 'effects test', it is applied to situations in which evidence is so overwhelming as to allow for no other inference but the existence of racial discrimination as a motivating purpose.[144] In other words, this test may act as an indicator that policy, though apparently neutral on its face, causes racial disparities.[145] Though implicit, or unconscious bias is rarely considered by courts in criminal cases, jurisprudence is slowly incorporating an acknowledgement of the fact that it is very difficult to dissect police action from race, and a race-neutral analysis rarely reflects the reality of policing.[146]

Relatedly, the 'similarly situated' test compares distinct effects of a policy on two groups, all factors constant but for race. In analyzing the New York City Police Department's Stop & Frisk policy, the United States District Court for the Southern District of New York held that "discriminatory effect was demonstrated with evidence that the New York Police Department 1) carries out more stops in areas where there are more Black and Latino residents, even when other variables are constant; 2) is more likely to stop Blacks and Latinos than Whites, even controlling for other relevant factors; 3) is more likely to use force against Blacks and Latinos, even controlling for other relevant factors; and 4) stops Blacks and Latinos with less justification than Whites."[147] Despite obvious harms, the motivation/intent test was easily passed, based on

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[143] Alyson Grine and Emily Coward, *Raising Issues of Race in North Carolina Criminal Cases* (University of North Carolina School of Government, 2014).
[144] Beyer, "Police Misconduct: Claims and Defenses Under the Fourteenth Amendment Due Process and Equal Protection Clauses."
[145] Grine and Coward, *Raising Issues of Race in North Carolina Criminal Cases*.
[146] *United States v. Barlow*, 310 F.3d 1007, 1010 (7th Cir. 2002).
[147] *Floyd v. City of New York,* 959 F. Supp. 2d 540 (S.D.N.Y. 2013).

allegedly good data and because no individual officer alone was responsible for implementation of the policy . However using the 'similarly situated' test, the inclusion of a discriminatory effect based on a similarly situated analysis provided enough support to succeed on a selective enforcement claim. It is a *prima facie* showing of discrimination. Habitual over-policing, as may be the result of predictive policing, causes individuals of particular demographics to become the frequent focus of data driven enforcement and pushes a self-perpetrating cycle of enforcement via the feedback loop.[148] In the unlikely case where data controllers are also the decision makers and have knowledge that the use of geographic factors which have clear correlation to race, it may be argued that officials act with apathy toward known, adverse effects. However typically patrol officers are removed from program development or training, or even the decision to use a risk assessment.

Finally, at times courts have found that apparent apathy toward the adverse consequences of a policy on particular groups demonstrates animus, though it is generally not sufficient alone to prove an act was racially motivated. Further, the bar for demonstrating indirect motivation or intent in the form of apathy as the result of blindly applying policy is set even higher. As direct motivation or intent is arguably cut off by the use of data and technology, and claims of apathy are less readily accepted by the Court, it is clear that claims of discrimination in predictive policing require a novel approach.

The solution may be hybrid in nature, accounting for the role of technology in disrupting the causal chain of discrimination and resulting in selective enforcement. At times a more encompassing interpretation has been adopted, deemed by some scholars as the "effects plus"

[148] *Supra Note* 13.

framework.[149] Increasingly, courts will infer intent when a totality of the circumstances assessment, in addition to a showing of disparate impact together, indicate racially motivated decision-making. A clear pattern of disparate effects, as well as historical background factors, may further indicate intent when there is a series of discriminatory actions over time.[150] Further factors may include the "the specific sequence of events leading up to the challenged decision; departures from normal procedures; and contemporary statements by relevant government decision makers and reports or other documents."[151] In the case of predictive policing an 'effects plus' analysis may conclude that when continual use of inaccurate assessments or public complaints of the same do not cause police to abandon the technology, it is indicative of intent. Though not yet present in jurisprudence on policing, courts have utilized the 'effects plus' analysis for two specific cases which parallel several elements within predictive policing: jury selection and voting dilution. The use of peremptory strikes in *voir dire*, the ability of counsel to discard a potential juror without cause or subject to challenge, is comparable to policing in that decisions are made behind a veneer of impartiality or distance from an objective, immediate observer.[152] In these cases, the Court has reaffirmed that clear statistical evidence of disparate effect weighs strongly toward the intent requirement. One compounding element may be demonstrated by the underrepresentation of another group as a result, allowing for the inference of "invidious discrimination" as motivation.[153]

Similarly, the Court has expanded its interpretation for inferring discriminatory purpose in cases of challenges to voting district apportionment by legislatures. Courts have held that the

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[149] "Beyond Intent: Establishing Discriminatory Purpose in Algorithmic Risk Assessment," *Harvard Law Review* 134, no. 5 (March 2021): 1760–81.
[150] *Village of Arlington Heights v. Metropolitan Housing Development Corp.,* 429 U.S. 252, 266-68 (1977).
[151] "Facial Recognition Technology and Law Enforcement: Select Constitutional Considerations" at 25.
[152] "Beyond Intent: Establishing Discriminatory Purpose in Algorithmic Risk Assessment" from 1769.
[153] "Beyond Intent: Establishing Discriminatory Purpose in Algorithmic Risk Assessment" at 1770, *citing Castaneda v. Partida*, 430 U.S. 482 (1977).

pattern and practice, as well as impractical or illogical results with no other plausible and identifiable intent may be inferred as based upon unjustified selective enforcement of voting rights. This has been found true in the case of redistricting challenges in which software is used to create legislative districts with results so unusual that it may only be inferred that race was a predominantly motivating factor.[154] Therefore, jurisprudence increasingly holds that when there is no identifiable individual behind a government action, it is not justification for disallowing an Equal Protection claim, particularly when technology is utilized. If the motivation principle was to remain strictly in force, using technology for government decision making would leave little practical room for plaintiffs to allege a claim of Equal Protection violation, a clearly unconstitutional method of governance and policing.

It is herein posited that predictive policing is potentially damaging to communities and individuals as a result of biases and in ways that subsume traditional police practices, in its propensity to drive selective enforcement of law. As has been reiterated, the biases held in police data, community attitudes, or by police officers themselves, are algorithmically transformed into a token reality of how crime exists in the real word. By relying on what is seen as an objective policing tool, predictive policing hides the overt biases inherent in crime data and in so doing allows biases to guide policing in manners which promote over- or under-policing of communities.

II. Data protection

As the thesis explores, there are overlapping and at times conflicting layers of individual protection through which police are held accountable for their actions. These protections span

[154] "Beyond Intent: Establishing Discriminatory Purpose in Algorithmic Risk Assessment" from 1774, *citing Bush v. Vera*, 517 U.S. 952 (1996).

legal frameworks and vary by jurisdiction in their interpretations. This chapter has thus far aimed to illustrate several of the ways in which traditional legal protections against discriminatory policing are less effective when applied to predictive policing. As discussed, predictive policing, a *de facto* form of criminal profiling, requires more data than traditional profiling and is not tied to a specific, known event or person. Further, the myriad data required feed into a "surveillance infrastructure" that may be reflective of real-world bias allowing potential discriminatory policing on an exponential scale. This sub-section will juxtapose the rights of non-discrimination and data protection to demonstrate the complimentary and potentially conflicting role of these frameworks.

This sub-section will proceed in the following manner. First the right of data protection will be explained through the lens of two jurisdictions. First it will describe the case of the EU Data Protection regime, as a robust, but incomplete check on the power of police uses of data and apply it to predictive policing; and second, it will briefly review the case of the U.S. for a view on some of the effects of predictive policing in the absence of data protection regulations. The choice of jurisdictions for this section is intended to reflect the importance of the EU data protection regime to European countries and the countries that share data with them. Though state transpositions vary, it is not possible to assess each member state in this work nor is this thesis intended to be an in-depth analysis of the LED which certainly warrants its own manuscript, therefore the analysis will stick with the content of the LED.[155] The U.K. is intentionally omitted from this analysis as it still largely follows the data protection legislation as

[155] More information on member states transpositions of the LED may be found here, European Data Protection Board, "Contribution of the EDPB to the European Commission's Evaluation of the Data Protection Law Enforcement Directive (LED) under Article 62," December 14, 2021, https://edpb.europa.eu/system/files/2021-12/edpb_contribution_led_review_en.pdf.

implemented within the EU. Though transposed via the 2018 Data Protection Act, this transposition follows the principles of the LED and will not be examined in any greater detail.[156]

The sub-section will next discuss tension between the application of data protection and non-discrimination. It will address the arguments for using a wider population of data to audit programs and identify biases in data and ergo support non-discrimination. It will be demonstrated that this form of regulation may yield more statistically accurate and theoretically less biased results, however it will also affect the right to data protection and privacy of countless innocent individuals unnecessarily, in contravention of data protection regulations. In conclusion, it will be suggested that data protection regulations are inadequate in application to predictive policing.

A. Case of the European Union

The EU has enacted several pieces of data protection legislation in recent years. The framework notably provides a dual approach to data protection, distinguishing criminal law enforcement uses of data from all other uses. As with the previously discussed approach to AI regulation, the data protection regime in the EU similarly utilizes a risk-based approach to the processing of personal data (by AI or other means) with a focus on protecting fundamental rights first and foremost. It is based around a set of procedural rights through which individuals have the ability to *inter alia,* contest, verify, and correct their personal data. Despite the intended flexibility and robustness of the framework, applied to criminal law it presents inadequacies and ambiguities. Whereas data protection seeks to protect a fundamental right, criminal law has the intended purpose of public security as weighted against due process and procedural rights for

[156] U.K. "Data Protection Act 2018" 2018, https://www.legislation.gov.uk/ukpga/2018/12/notes/division/14/index.htm.

suspects and defendants. Though the frameworks may to a degree work complimentarily, they remain separate entities, crafted for purposes that are distinct and at times at odds.

This section will demonstrate the ways in which data protection as currently constructed is inadequate when applied to criminal law. It will then address the further complicated nature of AI in this context, juxtaposing the previously discussed right to non-discrimination against data protection, when AI tools are utilized. Specifically, after describing the data protection framework in the EU, it will show how using data to improve accuracy of AI to ensure anti-discrimination will violate tenets of data protection.

The EU General Data Protection Regulation (GDPR) of 2016[157] was accompanied by the Law Enforcement Directive (LED or Directive).[158] The Directive provides the guidelines, prohibitions, and lawful exceptions for the processing of personal data for the purposes of the prevention, investigation, detection or prosecution of criminal offenses.[159] As constructed within the data protection regime, these re separate bodies of data, yet as will be discussed, in practice there are considerable overlaps. For the purposes of predictive policing, the LED may be seen as a check on some of the issues that were previously discussed as resulting from the improper collection, retention, and use of data. Article 4(1) of the LED provides in part that data collected for law enforcement purposes by a competent authority, which fall within the purview of Union competencies, must be

[157] Regulation (EU) 2016/679 of the European Parliament and of the Council of 27 April 2016 on the protection of natural persons with regard to the processing of personal data and on the free movement of such data, and repealing Directive 95/46/EC.
[158] Directive (EU) 2016/680 of the European Parliament and of the Council of 27 April 2016 on the protection of natural persons with regard to the processing of personal data by competent authorities for the purposes of prevention, investigation, detection or prosecution of criminal offences or the execution of criminal penalties, and on the free movement of such data, and repealing Council Framework Decision 2008/977/JHaA.
[159] The United Kingdom has retained the implementation of the GDPR and LED and follows the same regime, therefore a similar framework is in place and it will not be discussed in this chapter. See, "Independent Review - Independent Advisory Group on New and Emerging Technologies in Policing" (Scottish Government, February 2023).

(a) processed lawfully and fairly;

(b) collected for specified, explicit and legitimate purposes and not processed in a manner that is incompatible with those purposes;

(c) adequate, relevant and not excessive in relation to the purposes for which they are processed;

(d) accurate and, where necessary, kept up to date; every reasonable step must be taken to ensure that personal data that are inaccurate, having regard to the purposes for which they are processed, are erased or rectified without delay.

It further requires that data is regularly reviewed and/or erased (Art. 5); categories of data must be distinguished as per the category of subject (Art. 6); and explicitly prohibits profiling resulting in discrimination (Art. 11). Finally, the LED differentiates between victims and suspects, among others as the subjects of data.[160]

Implementation of the Directive is according to Member State prerogative accepting that the Directive form a baseline for data protection aimed at promoting the rights contained in Article 7 Respect to Private and Family Life, and Article 8 the Protection of Personal Data, of the EU Charter of Fundamental Rights. It is posited here that though the LED and GDPR may provide some degree of protection against violations in the course of predictive policing, there are still many unanswered questions as to which framework applies and in which situations, leaving some degree of ambiguity as in applying the available protections. As has now been discussed at length, predictive policing is only possible via large amounts of data. Issues such as purpose limitation, which is core to the GDPR,[161] within the LED is dependent on context and

[160] Id. Art. 4(1).
[161] Art. 5(1)(b).

exceptions; the strictures for which are much more detailed and hinge on the legal basis, purpose, and controller.[162] Another example, the LED requires that data processing occur for the prevention, investigation, detection or prosecution of criminal offences. However as discussed in Chapter 2, policing covers numerous mandates that sit outside the realm of crime control. When data is collected and processed for one of these functions between the scope of the Directive, the GDPR will apply. As scholars have asserted, this may offer ample protection to data subjects.[163] However as police uses of data may in practice be more fluid, it is suggested here that this ambiguity may allow for lapses in accountability. Similarly, the definition of a competent authority per the applicability of the LED may vary in the case of predictive policing, which in many cases relies upon a private-public partnership in the development of software and storage of data. As a detailed analysis of the LED or GDPR will not be possible within this work, a brief outline of some predictive policing specific issues is provided below.[164]

The above complexities apply to all police uses of data, but predictive policing presents additional hurdles to applying the LED. First, it must be determined whether the data in question are 'personal' for the purposes of data protection.[165] Predictive policing relies on additional sources of data not collected or maintained by policing entities nor typically considered personal

[162] Paul De Hert and Juraj Sajfert, "The Fundamental Right to Personal Data Protection in Criminal Investigations and Proceedings: Framing Big Data Policing through the Purpose Limitation and Data Minimisation Principles of the Directive (EU) 2016/680," Brussels Privacy Hub Working Paper (Brussels Privacy Hub, December 2021).
[163] Id.
[164] See, Paul De Hert and Juraj Sajfert, 'The role of the data protection authorities in supervising police and criminal justice authorities processing personal data' in Briere, C. and Weyembergh, A (eds), The needed balances in EU Criminal law: past, present and future, 2017, Hart Publishing; Tristan Radtke, "The concept of Joint Control under the Data Protection Law Enforcement Directive 2016/680 in contrast to the GDPR," 11 *Journal of Intellectual Property, Information Technology and E-Commerce Law*, 3 (2020); European Council, "Data Protection Law Enforcement Directive (EU) 2016/680 Transposition; Updated State of Play in the Member States (12/04/2019)," April 12, 2019, https://ec.europa.eu/transparency/regexpert/index.cfm?do=groupDetail.groupMeetingDoc&docid=30309; David Wright and Paul De Hert, *Enforcing Privacy: Regulatory, Legal and Technological Approaches* (Springer, 2016).
[165] Orla Lynskey, "Criminal Justice Profiling and EU Data Protection Law: Precarious Protection from Predictive Policing," *International Journal of Law in Context* 15 (2019): 162–76.

data. Most place-based predictive policing relies heavily upon data that is publicly sourced, such as census information, weather history, and geographical features. These data are neither collected by law enforcement nor for law enforcement, thereby making Article 5 of the GDPR much more relevant to their processing. Similarly, information that is based on neighborhood statistics or impersonal characteristics such as weather may be arguably outside the scope of personal data. At the point at which police intercept this information and process it for policing, it may be contested as to whether and how the Directive will apply.[166] In assessing whether there is information data for an identified or identifiable person in play here, it is fairly straightforward in that police records relate directly to individuals. The ECtHR has held that information may be considered personal even if it is not information that would generally be considered private under Article 8 ECHR.[167] The use of massive quantities of personal and non-personal data further presents an issue to the distinct architecture of the data protection instruments. Even public, non-personal data taken in aggregate may lead police to an individual may indeed allow the supposition that this data is related to an individual.

The data protection laws may be described as 'self-management' of individual rights which adds a layer of inadequacy to data protection over predictive policing. Indeed, Art. 11 of the LED extends the right against automated processing that causes adverse effect on an individual.[168] In predictive policing it is clear that individuals are significant due to membership in a group and therefore the group is the subject of analysis in a system such as hotspot analysis.[169] Group membership, or profile group membership, is hard to challenge on the

[166] Lynskey.
[167] Suzanna Warso, 'Human Rights Requirements for Person-Based Predictive Policing, Lessons from Selected ECtHR Case Law and Its Limits' [2022] Technology and Regulation 71.
[168] Teresa Quintel Juraj Sajfert, "Data Protection Directive (EU) 2016/680 For Police and Criminal Justice Authorities," 2019, referencing LED art 11.
[169] "Towards Policing 3.0: Digital Transformations in Policing to 2025: Anticipation and Performance."

individual level, yet may affect individual lives none the less. As discussed in the preceding section above, a group profile is a strong component of predictive policing as well as fertile ground for discrimination. Despite the apparent problematic nature of predictive policing on group rights, the European Court of Justice (ECJ) has held that on the question of individual rights under the LED, the use of group surveillance, as in a hotspot analysis, is preferable to the use of general, blanket surveillance.[170] It elaborated that within the context of certain protections as regards data retention, the use of location or traffic data is allowable for fighting serious crime. This raises questions as to the applicability and actual protection offered by the LED both to individuals and groups.

In addition, the challenges of meaningful consent, foreseeability, or legal certainty to individuals when viewed as group members negates the protections offered through data protection. Foreseeability and legal certainty, both previously discussed, are critical aspects of the rule of law. Specific to data protection, consent is similarly lacking in the context of predictive policing. Due to the expansive fields of data used, the discrepancies between purpose at collection and by police, and the surreptitious nature of predictive programs, there is no consent, meaningful or otherwise. Further, this may be argued as necessary to the function of proactive crime control, and may be seen as demonstrated by the omission of transparency in the LED as exists in the GDPR.

Next is to determine which law applies, depending on the particular purpose of the data processing and by what entity.[171] Article 4(b) of the Directive requires that data is collected and processed for an explicit purpose. Police data in the form of *inter alia* arrest, stop, and detention

[170] *Tele2 Sverige and Watson*, C-203/15 and C-698/15, Judgment of the ECJ (2016), para 108-109.
[171] De Hert and Sajfert, "The Fundamental Right to Personal Data Protection in Criminal Investigations and Proceedings: Framing Big Data Policing through the Purpose Limitation and Data Minimisation Principles of the Directive (EU) 2016/680."

records may be utilized in identifying crime trends that form a large portion of the data used for predictive policing.[172] Because these data are procured by police entities for the specific purpose of prevention and investigation, they will be subject to the Directive. When data may move between controllers and/or purposes, the relevant restrictions and protections apply. There is therefore a potential disconnect if private companies are responsible for the sorting or processing of this same police data through privately run predictive software. In this case, at the point of transfer the GDPR may be the relevant law and offers different protections and requirements for the handling of that data.[173] At the same time, requirements on the forward processing of data per the LED may apply. This means that if data moves from purview of the LED to the GDPR, it must meet all the original requirements of data collection as set forth in the GDPR, triggering a series of acts necessary to maintain lawfulness, including notice to the data subject and transparency as provided for by the GDPR.[174] Though in theory this provides robust data protection, there is in practice little precision or clarity as to how these processes work together and as a result a lack of foreseeability. Further it has been held by the ECtHR that the type of data retention and processing crucial to predictive analyses, such as criminal records, cautions, and dropped charges, may be an infringement on the Art. 8 on the right to private life and may even warrant additional protection.[175]

In 2017, the ECtHR held that when information is compiled about an individual that may affect his/her rights in the future, that data is then considered to be about that person, as in the

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[172] Id.
[173] Art. 9(1) LED stipulates that, "Where personal data are processed for such other purposes, Regulation (EU) 2016/679 shall apply unless the processing is carried out in an activity which falls outside the scope of Union law."
[174] De Hert and Sajfert, "The Fundamental Right to Personal Data Protection in Criminal Investigations and Proceedings: Framing Big Data Policing through the Purpose Limitation and Data Minimisation Principles of the Directive (EU) 2016/680."
[175] See, *M.M. v. the United Kingdom*, No. 24029/07 Nov. 13, 2012; *Brunet v. France,* No. 2101/10, 2014; *and Catt v. the United Kingdom*, 43514/15, 2015, which address the use of older data.

case of an examiner's notes on an individual test taker. [176] It further held that the information needed to identify the individual if based on disparate points of data, need not all be retained by the same entity but instead if it is possible to piece the information together using "means reasonably likely to be used" even if difficult, identifiable and personal.[177] Though it may be argued that disparate, non-personal data are not themselves meaningful or obviously relatable, in the case that a crime does occur it is highly likely that they will be used in conjunction for police investigation, thereby implicating individuals and making their identification highly likely. This also allows attribution of a purpose for the data collection, however up until this point it may remain within the purview of the GDPR. It may be further inferred according to the reasoning in *Nowak*[178] that the output of a risk assessment, or the recommendation of the machine, would be considered data about a particular individual, making it additionally subject to the LED.[179] Once determined that data are 'personal' and processed for the purposes of preventing, investigating, detecting or prosecting crime, Article 4(d) requires that data is accurate and up to date. In the case of predictive policing this should limit or halt the inclusion of erroneous or stale data, making predictive analysis more precise. However as discussed, police data are not always accurate for a variety of reasons.

One area where the GDPR and LED diverge more substantively than the question of applicability are their respective approaches to automated processing. Whereas the GDPR allows for an individual to invoke their right to not have their information processed by automated means, the LED specifically prohibits decision-making by automated processing where there is

[176] *Case of Breyer v. Germany*, App. No. 50001/12) Strasbourg.
[177] Eleni Kosta and Franziska Boehm, "Draft Commentary on Article 3 of the EU Law Enforcement Directive," in *The Law Enforcement Directive: A Commentary* (Oxford University Press).
[178] *Peter Nowak v. Data Protection Commissioner*, Judgment of the Court (Second Chamber) of 20 December 2017, ECLI:EU:C:2017:994.
[179] Supra Note 155.

no human involvement. However it must be remembered that despite this robust protection, 1) it is not always clear whether the GDPR or the LED applies; 2) to what degree automated processing or decision making is occurring in the case of policing in which the officer has the ultimate discretionary power to take action; and 3) acknowledging that automated processing for non-decision making functions does not fall within the scope of the LED. The LED does not allow profiling based on "sensitive" data that leads to an adverse legal effect, for these purposes, discrimination.[180] While the LED requires that data contested by the subject as inaccurate must be restricted in used or addressed, the lack of transparency as to data retained makes the right arguably unenforceable.[181] This acknowledges the importance of data to policing and state security and the frequent lack of consent that an individual may experience in this context.

The EU, though offering one of the most robust data protection schemes in the world,[182] still has not managed to institute a framework that would comprehensively protect the right to data protection or against discrimination in the application of predictive policing. However at the time of writing, the data protection framework is set to further evolve. Since 2018 the EU has been working toward a comprehensive legal instrument to regulate the use of trustworthy AI within the Union, which led to the 2021 proposal by the European Commission.[183] As of June 2023, the European Parliament its negotiating position on the AIA. This includes a ban on certain uses of AI, including predictive policing systems based on profiling, location or past

[180] Rec. 38 LED states that, "'Profiling that results in discrimination against natural persons on the basis of personal data which are by their nature particularly sensitive in relation to fundamental rights and freedoms should be prohibited…"
[181] MR Leiser and BHM Custers, "The Law Enforcement Directive: Conceptual Challenges of EU Directive 2016/680," *European Data Protection Law Review*, 2019.
[182] European Commission, "Data Protection in the EU; The General Data Protection Regulation (GDPR), the Data Protection Law Enforcement Directive and Other Rules Concerning the Protection of Personal Data.," https://commission.europa.eu/law/law-topic/data-protection/data-protection-eu_en.
[183] European Commission, "Shaping Europe's Digital Future," n.d., https://digital-strategy.ec.europa.eu/en/policies/european-approach-artificial-intelligence.

criminal behaviour)."[184] This work argues that even with a ban on its use in the EU, predictive policing in third countries will have drastic effects on cross-border crime control and information sharing. Therefore this thesis devotes attention to this instrument, but will outline the Act's main points relating to predictive policing based on the proposal as set forth while negations with the European Council were inconclusive at the time of writing.

Looking ahead to the potential progression of the AIA to EU regulation, there are additional protections that may be afforded individuals against issues that may proliferate with the use of AI for predictive policing. Though the Parliament has recommended a full ban on "predictive policing systems (based on profiling, location or past criminal behavior)", this section will address the AIA in its current formulation.[185] Considered within the risk classification scheme, there is still considerable ambiguity as to how the AIA would affect criminal law processes and procedural guarantees. Just as the existing data protection instruments are written from a fundamental rights perspective within the context of a digital society, the AIA aims to regulate the development and market introduction of AI according to proportionality of the perceived risk to potential benefits, according to sector.[186] The opening commentary to the AIA,[187] discussed below, mentions the principle of due process yet never provides explicit measures to ensure its enforcement. Defense rights, the right and availability of

[184] European Parliament, "MEPs Ready to Negotiate First-Ever Rules for Safe and Transparent AI," press release, June 14, 2023, https://www.europarl.europa.eu/news/en/press-room/20230609IPR96212/meps-ready-to-negotiate-first-ever-rules-for-safe-and-transparent-ai.
[185] European Parliament.
[186] Suncana Roksandic, Nikola Protrka, and Marc Engelhart, "Trustworthy Artificial Intelligence and Its Use by Law Enforcement Authorities: Where Do We Stand?" (45th Jubilee International Convention on Information, Communication and Electronic Technology, Croatia, 2022), 1395–1402.
[187] Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND THE COUNCIL LAYING DOWN HARMONISED RULES ON ARTIFICIAL INTELLIGENCE (ARTIFICIAL INTELLIGENCE ACT) AND AMENDING CERTAIN UNION LEGISLATIVE ACTS, COM/2021/206 final.

redress, and transparency have been specifically recommended by European Parliament as necessary additions to the existing data protection framework and proposed AIA.

As briefly discussed in Chapter 1, the AIA categorizes risk and attributes it to providers of AI technologies that are generally not yet tested or even designed, let alone in circulation among users. The levels of risk are set out as minimal, limited, high, and unacceptable.[188] The requirements of regulation for a particular use of AI therefore correlates to its determined level of riskiness to meet the principle of proportionality, making the then required behavior to be adaptable to the case, rather than a binary approach predicated on permissible versus not (excepting very risky uses which will be outright banned). Much of the thrust of the Act is in mandating the actions to be taken by designers and providers of AI devices before reaching the market, though some direction is further provided to the users of the devices. Requirements include a combination of precautionary bans, risk assessment and mitigation, and voluntary self-regulation.[189] In contrast to the GDPR, remedy to those who may be affected by violations caused by AI devices are not provided for within the Act.

The AIA Recital 40 distinguishes the uses of AI for criminal justice between those expressly for aiding decision making versus those that are purely administrative. It goes on to describe the need for "robust" AI, which requires resilience against risks such as errors, inconsistencies and other unexpected or unintentional flaws.[190] It flags the risks to fundamental rights that may result from non-resilient systems as directly implicating biases outputs. In returning to the above discussion on forms of bias, it appears that the AIA takes the view of bias that includes machine and statistical errors that may manifest and reproduce in the process of

[188] Grady, "The EU Should Clarify the Distinction Between Explainable and Interpretability in the AI Act."
[189] European Parliament News, "AI Act: A Step Closer to the First Rules on Artificial Intelligence" (European Parliament, May 11, 2023), https://www.europarl.europa.eu/news/en/press-room/202305051PR84904.
[190] Supra Note 168.

machine learning. In order to mitigate against these risks it shall require that regular examination and monitoring of data be used to ensure the detection and correction of biases in high-risk systems, such as those used for criminal justice systems. In addition, particular categories of data, as used for law enforcement purposes may be subject to additional privacy-preserving measures, such as limitations on re-use of data and pseudonymization.[191] Despite this, the European Parliament adopted a resolution subsequent to the AIA, addressing the importance of criminal procedural rights as lacking in the current framework and in explicit terms as the AIA is drafted. It indicates that AI in the criminal law context is not just a tool but rather helps to shape "the design and the objectives of law enforcement and of criminal justice systems."

Though it has been discussed in Chapter 1 that predictive policing has been labelled by many as an unacceptable high risk application of AI which must be banned, it is informative to weigh how the AIA may mitigate certain risks inherent in predictive policing, particularly in the context of the existing data protection framework. First, the discrimination that is inherently most likely with predictive policing is derived of several overlapping layers of bias. Whereas policing has always been embedded with human biases, the use of AI on these data amplify these prejudices. Insofar as machine or automated bias, such as through the decontextualization or statistical misapplication to real world applications may be severed from human biases, the AIA may act to monitor and better mitigate those forms of bias. There are several points in the current AIA proposal that deal specifically with the biases inherent in the use of AI that are relevant to discrimination in predictive policing.[192] The regular monitoring for error in data, as well as the additional protective measures proposed may help to ameliorate some of the biases that result of machine learning processes. Second, in so far as data may be held to a higher standard of

[191] id.
[192] Mehdipour et al., "Reducing Profiling Bias in Crime Risk Prediction Models."

monitoring and protection, this may help to identify infiltration of human or pre-existing biases or the data categories that allow for their entrance into the algorithms. In conjunction with the existing data protection regime, the AIA may stand to provide additional safeguards unique to the use of predictive policing. While the existing data protection framework offers protections over the processing and retention of data, the AIA will target the actual processing tools and means. Though the AIA may lead to the end of predictive policing in the EU, this may indicate an end to algorithmic processing that pushes predictive policing in another direction. A topic deserving of a longer work unto itself.

B. Entrenching Data Biases: Case of the United States

The United States provides a compelling cautionary tale for the potency of erroneous data to affect individuals' rights and private lives. The effects of data resonate beyond the criminal justice system to all areas of public life. This section will briefly describe the environment in which police records are considered public in the U.S. and how this allows private actors to intervene in the task of policing. It will then describe the collateral consequences of crime data which may never be fully forgotten or excised from the record. It is the goal of this section to illustrate the potentially problematic nature of police data when used to make predictions about crime, and to highlight the importance of a data protection regime as a protection against the potential harms of predictive policing.

Police records in the United States are generally public domain as they are considered both a historic fact and in the public interest. Arrest records and mug shots are freely available by Google search and even a small financial investment will allow a private citizen to acquire the

additional details of a record.[193] Therefore even when an arrest record may be properly expunged or updated to indicate the final disposition of a case, there is potentially an infinite record of the arrest through other repositories.[194] Whereas in other jurisdictions restrictions are placed on the collection, processing and retention of data, police records here are freely shared and readily available for whatever purpose they may be sought. Similarly, without the right to contest or correct inaccurate data, police records themselves are highly problematic. Though records may be shared between jurisdictions, agencies or departments, this is by request and there is no requirement that it be so. Even when a record may be updated or closed, it is no indication that all other derivative or shared records are so up to date. A 2010 Bureau of Justice Statistics survey of twenty-seven states showed that despite a recommended uniform system of record maintenance was instituted, only eighteen had actually complied.[195] In addition, it has been found that police in the United States may record an arrest multiple times for the same incident, termed a "hanging arrest."[196] In this case, even when a disposition of charges has been correctly entered into the record, it may not be applied to all records related to the incident in question.

Records relied upon by police, which have been mined for private gain do not necessarily comply with the standards that generally guide law enforcement data collection, just as records as compiled by law enforcement are not formatted for the eventual use in algorithmic processing. Companies collect, compile, or extract whatever data they wish in order to sell it for a profit to any number of entities: citizens, companies, and even police departments.[197] Predictive policing,

[193] Jacobs, *The Eternal Criminal Record*.
[194] Lageson, *Digital Punishment; Privacy, Stigma, and the Harms of Data-Driven Criminal Justice*.
[195] Jacobs, *The Eternal Criminal Record*.
[196] Sarah Esther Lageson, *Digital Punishment; Privacy, Stigma, and the Harms of Data-Driven Criminal Justice* (Oxford University Press 2020) at 48-49.
[197] Andrew Ferguson, 'Illuminating Black Data Policing' (2018) 15 Ohio State Journal of Criminal Law 503 at 507-508.

like other forms of patrol, requires that officers record their interactions with citizens.[198] In predictive policing, the capability to foresee an individual's perceived dangerousness extends even further.[199] When the record becomes public or quasi-public domain, this extends into one's private life. In addition to the glaringly obvious room for errors to proliferate as data changes hands and purposes, this also creates a forum in which policing may be carried out by the general public as an informal form of enforcing security and in extreme cases, vigilantism.[200]

The accessibility of information about any individual spans an incredibly vast portion of their lives, including any criminal record or history. It may be used in assessing a job or university application, an interview for renting a home, or even in matters of child custody or related background checks. In the case of predictive policing, where one may become a 'person of suspicion' due to where he/she lives, the effects on their life may be disproportionately adverse. An individual's police record may be shared with an employer at the cost of a potential job, the denial of a home rental contract, or denial to a university.[201] When the data reflect inaccuracies or are otherwise erroneous, the subject will still suffer the collateral consequences of a violation of law. Predictive policing is arguably as much a generator as a receiver of these records/data, with little oversight, access to remedy, or general clarity of function.[202]

In contrast with the EU data protection regime for example, the lack of protections or available remedy highlight the potential for predictive policing to be used in highly intrusive ways and make evident the importance of data protection as a protection to individuals against police overreach. However even in jurisdictions where data protection is much more strict, the

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[198] Sarah Esther Lageson, *Digital Punishment; Privacy, Stigma, and the Harms of Data-Driven Criminal Justice* (Oxford University Press 2020) at 15.
[199] Jacobs, *The Eternal Criminal Record*.
[200] Vigilantism over previously charged sex offenders in the United States is not infrequent, as sex offense registries are made known, as well as more punitive measures of a subjective, vengeful and public nature.
[201] O'Neil, *Weapons of Math Destruction*.
[202] Jacobs, *The Eternal Criminal Record*.

potential for faulty data to infiltrate public and law enforcement processes proliferates. It is therefore necessary, though not sufficient, that the data protection framework be present in the legal frameworks applied to predictive policing.

C. Data for Targeting Biases

As is discussed in the foregoing sub-section, the data protection and privacy frameworks when currently applied to uses of predictive policing do not provide a solid protection to individuals against infringements of their rights. Even more interestingly, an attempt to use data to root out biases and correct discriminatory policing may directly infringe data protection frameworks. Despite this, widening the pool of data for training and auditing algorithms is currently considered one of the most effective means of ensuring the accuracy of data and its output.

It is well accepted that law enforcement data, which may be collected across mediums, individuals, and shared widely, leave ample room for unseen errors to be incorporated and multiplied, even before the addition of algorithmic processing. When the use of algorithmic processing is included, these errors may multiply exponentially at rapid speed. Implementing certain features of data protection are not practically feasible in large law enforcement agencies which work with large, diverse sets of data.[203]

Another way in which data quality checks are proposed is by adding more data to the set to test for quality and result. While this may work against the principle of minimization and purpose limitation, it does address a problem frequently cited to the central theory of predictive

[203] Martyna Kusak, 'Quality of Data Sets That Feed AI and Big Data Applications for Law Enforcement' (2022) 23 ERA Forum 209, 214.

policing. This problem centers around the notion that there is a fabricated environment in which predictive policing operates. It occurs when crime data and reports of past crime constitute the core of usable information, therefore there is a whole subset of crime that is never reported. Similarly, only members of the population that have been involved with a crime are included in analyses, neglecting the majority of individuals. Both these limitations on data affect the reality that is being reflected by the predictive assessments, as it is not a true representation of the general population. A predictive assessment is generally most accurate for the training data, therefore by ignoring a larger of subset in the model, the baseline is skewed from what the actual population looks like.[204] Crime is committed by a minority of individuals, however when using predictive policing software, this sub-population is exaggerated through the omission of non-crime committing individuals, inflating a base rate fallacy.[205]

By including additional sets of data, or even as some have suggested infusing as much data as possible, accuracy should increase both in terms of rooting out biases and operating according to a more accurate base rate. This is even listed as a principle within the AIA as a means of bias monitoring and detection in high risk systems.[206] However in referring to the data protection principles above, there is a clear shirking of the right when invoking this method of audit. This is particularly true as achieving non-biased data in terms of categories such as race or gender would require the collection of these particular categories of data in order to determine

[204] Farhad Mehdipour and others, 'Reducing Profiling Bias in Crime Risk Prediction Models' (2021) 1 Journal of Applied Research & Practice 86, 89.
[205] Hazel Kemshall, 'Risk Assessment and Management of Known Sexual and Violent Offenders: A Review of Current Issues' (U.K. Home Office Policing and Reducing Crime Unit 2001) 140, 14-16.
[206] Recital 44 of the AIA states that "High quality training, validation and testing data sets require the implementation of appropriate data governance and management practices…. The requirement for the datasets to be complete and free of errors should not affect the use of privacy-preserving techniques in the context of the the development and testing of AI systems." Rec. 44, AI Act; see also, Martyna Kusak, 'Quality of Data Sets That Feed AI and Big Data Applications for Law Enforcement' (2022) 23 ERA Forum 209, 217.

when an action or result was based in a discriminatory purpose.[207] However according to the GDPR and LED, these categories are considered "special categories" and provide a general prohibition on the processing of these categories of data.[208] In many EU Member States these data are unavailable or even banned from collection.[209] Indeed it would not only be the collection of these data, but their retention and processing, as well as the potential for unintended uses or nonintentional disclosures in the future.[210] It must also be considered that the complex, algorithmic processing of personal data leads to the creation of new data categories, or new generations of data, which must also be subject to the relevant law.[211] The ECtHR has often found that the storage of personal data may constitute an infringement to the right to private life,[212] per Article 8, para. 1, particularly in situations where there was no prior offense.[213] This was held to be also true of data that is not necessarily personal, but when processing in conjunction with other data may allow for inferences as to person.[214] As was found in the Netherlands, indiscriminate data collection cannot be considered necessary according to the Police Data Act.[215] Despite the potential that it may enhance aspects of fairness, there is no proof

[207] van Bekkum and Zuiderveen Borgesius, "Using Sensitive Data to Prevent Discrimination by Artificial Intelligence: Does the GDPR Need a New Exception?"
[208] GDPR Article 9(1); LED Art. 10.
[209] 'Regulating Artificial Intelligence for Use in Criminal Justice Systems in the EU' (Fair Trials 2020) <https://www.fairtrials.org/sites/default/files/Regulating%20Artificial%20Intelligence%20for%20Use%20in%20Criminal%20Justice%20Systems%20-%20Fair%20Trials.pdf>, 34.
[210] Marvin van Bekkum and Frederik Zuiderveen Borgesius, 'Using Sensitive Data to Prevent Discrimination by Artificial Intelligence: Does the GDPR Need a New Exception?' (2022) 48 Computer Law & Security Review, 9-10.
[211] De Hert and Sajfert, "The Fundamental Right to Personal Data Protection in Criminal Investigations and Proceedings: Framing Big Data Policing through the Purpose Limitation and Data Minimisation Principles of the Directive (EU) 2016/680."
[212] *S and Marper v. the United Kingdom*, App nos 30562/04 and 30566/04 (ECHR, 4 December 2008), holding that the retention of private data may infringe on the right to enjoy a private life, per Art. 8.
[213] Zuzanna Warso, 'Human Rights Requirements for Person-Based Predictive Policing, Lessons from Selected ECtHR Case Law and Its Limits' [2022] Technology and Regulation 71, 75, 78.
[214] *Segerstedt-Wiberg and Others v. Sweden*, App no. 62332/00 (ECHR, 6 June 2006, final 6 September 2006).
[215] Wieringa, "'Hey SyRI, Tell Me about Algorithmic Accountability': Lessons from a Landmark Case."

that predictive policing in the Netherlands is effective, therefore demonstrating that the inclusion of additional data to audit the functioning of a predictive policing system will be unlawful.

III. Analysis

This chapter has explored distinctions between the way in which bias causes discriminatory policing in the context of 'traditional' policing and in predictive policing. It has done so through analyses of the anti-discrimination right, in the CoE, looking at the case of the Netherlands, as well as the right to equal protection in the U.S.. It followed by addressing the rights afforded by data protection in European countries using the EU framework and the consequences of little data protection as in the U.S. Finally, the chapter suggested that the use of AI in predictive policing causes a tension between these rights in practice. In assessing the protections vis-à-vis predictive policing, the chapter posits three main arguments. First, that the use of predictive policing increases the likelihood that biases will manifest in discriminatory policing; second, that the existing legal framework for protecting the right of data protection is inconclusive and inadequate when applied to predictive policing; and third, that existing data protection frameworks are at odds with the right of anti-discrimination due to the use of AI.

Predictive policing differs from 'traditional' policing in that it sets out to prevent crime through the creation of a criminal profile based on correlations between the characteristics of former crimes and real-time factors.[216] Harnessing available data, it may through automated processes predict the likelihood of where, or by whom, future crime may occur to a measurable degree of probability. It is a form of deductive reasoning that would traditionally be done heuristically, but the ability to process and sort vast quantities of data allows for a wider reaching

[216] Ref. Ch. 2.

and theoretically more accurate prediction of crime. The difference from human deduction however, is the context-less application of AI to the available data. Applied in the real-world, protected characteristics may be given undue weight in an assessment, unbeknownst to the officer or user of the program. The effects are simultaneously amplified by the reach of the data and the sophistication of the machine which may also function with bias. In addition, due to the myriad data utilized, there is inherently an inclusion of large quantities of incorrect data or data which should not be included for assessment. It is particularly true with the use of police data, which is often not audited or updated and therefore reflects any past instances of discriminatory policing or community stereotyping. Per the feedback loop these inaccuracies become self-confirming facts, and may continue to provoke police behavior that exacerbates existing biases or the selective enforcement of law.[217] This intensifies and supersedes the harm which may have originally occurred without the amplification of AI processing, and spreads it across a larger number of individuals, as well as to whole communities, most of which are totally innocent of the anticipated crime.

Predictive policing also differs from traditional policing in that though harm may be amplified, the existing enforcement mechanisms and protections for individuals are not accordingly adapted. As demonstrated, multiple legal frameworks which traditionally provide the determination for when an act which may be considered discriminatory, are obscured by the automation of processes as well as the opaque nature of the tool that renders it complicated to evaluate. In addition to the lack of clarity in algorithmic processing as a function, it is difficult to ascertain the degree to which predictive policing is efficient. Therefore, to achieve a proportionate ends-means analysis is virtually impossible within current standards. Similar to the

[217] Babuta, Oswald, and Rinik, "Machine Learning Algorithms and Police Decision-Making; Legal, Ethical and Regulatory Challenges."

framework protecting against discrimination, a data protection framework is not sufficient to mitigate the harms of predictive policing. Where the EU has in place a strong and forward-looking data protection framework, this chapter has highlighted some of the opacity in applying it to predictive policing. Contrasted with the U.S., in which no such framework exists, it is clear that data protection is crucial to lawful policing, however as currently constructed, inadequate to address the complexities of predictive policing.

Looking at instruments such as the LED, which is designed for law enforcement agencies, there is still inadequate attention paid to due process standards. Similarly, ambiguity in where the GDPR applies to large data sets later intercepted for law enforcement use weakens the framework. With the addition of AI, these distinctions and applications of data protection is further clear. The current inconclusiveness of legal mechanisms further complicates what may already be a very difficult road to a successful claim by an individual who has suffered harm. This may eliminate the ability or attractiveness of making a claim at all, or possibly make it more likely that an individual may seek an alternate route to remedy. Similarly, a citizen in the U.S. may be deterred from making a claim of selective enforcement when faced with the knowledge that it is unlikely to succeed. This is already the case in instances of 'traditional' discriminatory policing, in which plaintiffs pursue an alternative claim by which the department or officer may face some degree of accountability. Though it is posited that these are not alone adequate in addressing a breach of the right against discrimination, they are important tools in an enforcement framework that has not yet caught up to the harmful effects of predictive policing.

Whereas an analysis of discrimination largely centers on human biases, the issue of machine and statistical biases is left largely unaddressed. This disregards the real world application of AI on processes such as risk assessment, which may cause new forms of bias or

exacerbate existing biases. Legislation such as the AIA may provide better guidance on the risks uniquely inherent to machine learning and the effects of AI on applications such as predictive policing, however as discussed in the context of the LED, this potential, future law is not written to be a criminal law instrument and fails to account for due process considerations.

As discussed, one of the most commonly proposed methods for eliminating biased data is through the use of larger populations of data that better reflect the population in reality. In the case of predictive policing, this means the inclusion of all individuals, not just those with a criminal record. While this may enhance accuracy and eliminate some biases, it runs afoul of data protection. In this way there is a direct tension between the rights of anti-discrimination and data protection. As a result, it is not only a fragmented set of frameworks as applied to predictive policing, but in some cases they may be mutually exclusive.

One possible method for alleviating some of this tension may come from the use of more transparent AI. Clarity on machine processes should make it easier to identify and root out forms of statistical biases. Similarly, another method would be the better auditing of data in predictive policing risk assessments. This will allow for better identification of human biases and discriminatory policing trends. Finally, an independent review of utilized data against population-wide statistics may alleviate baseline fallacy while protecting data protection.

IV. Conclusion

As the thesis seeks to identify the relevant legal frameworks for predictive policing, this chapter has explored one of the tensions that arise between rights frameworks. In so doing it has assessed the right against discrimination, as well as the right to data protection. These rights are overlapping in several ways however may also be put at odds with the use of predictive policing.

Though the jurisdictions assessed approach these rights in varying ways, it is clear that the frameworks as applied to predictive policing differ from their applications to 'traditional' policing methods. This chapter has suggested several of the ways in which predictive policing may exceed traditional methods in some of the potential harms, largely those that derive of the use of myriad data and the effects of the various included biases caused by machine learning and statistical outputs. One frequently suggested solution is the use of larger data sets to increase accuracy and root out discrimination-inducing biases. While this may lessen discrimination of individuals and groups, it weakens data protection and privacy rights. It is therefore suggested that the current fundamental rights frameworks are not only inadequate to address the potential harms of predictive policing, but may be impossible to bridge in practice.

6. Conclusions

A. Introduction

This work has endeavored to place predictive policing into the legal framework most appropriate to safeguard individuals against its potential harms. In so doing, it has also been discussed the dynamic interplay between the individual and group that makes this form of crime control so difficult to categorize in its legal effects. Accounting for the various forms of harm, previously unknown at such a scale in policing, it has been demonstrated that the traditional legal principles which have previously protected individuals' fundamental and due process rights are not sufficient to meet the manner in which predictive policing changes the act of policing and the outcomes for individuals, especially in the context of sweeping technological change. The use of sophisticated tools and myriad data drastically alter policing and the relationship with individuals to the state. However with the infusion of AI into these tools, not only are new avenues for control opened, but the machine generation of new knowledge exacerbates existing errors and biases in exponential ways. This creates new scenarios of criminal law enforcement which remain novel to existing law.

The thesis assesses the even further problematic nature of applying the traditional legal framework to predictive policing, finding that it causes ambiguities, overlaps, and tensions between the very rights intended to offer protection and redress. The use of several very distinct jurisdictions has been intended to demonstrate that this problematic misalignment of fundamental rights and criminal justice is not unique to a specific location; for instance neither in the U.S. where predictive policing is prolific and relevant regulations lacking, nor in European

jurisdictions where regulation precedes the use of predictive policing yet its position subject to traditional legal frameworks does not provide adequate safeguards.

This brief concluding analysis will synthesize the foregoing findings to address some of the most pressing and salient harms of predictive policing and offer the conclusion that its use is incompatible with existing legal standards and the current state of the law makes its use wholly problematic regardless of jurisdiction. It will begin by addressing the way in which predictive policing has changed the enforcement of criminal law to an administrative set of practices that monitor behavior on an ongoing basis to detect anomalies or correlations of characteristics that may indicate a propensity for crime, either in the form of an individual or place. The argument will proceed in weighing the change in how police assess individuals' behavior from a new temporal perspective and relative to an anticipated group character, and the way in which this changes the individual's relationship to crime.

The following section will revisit the legal frameworks as addressed within the chapters to determine where the disconnect between traditional applications of criminal law enforcement with the new administrative and temporal approach to policing may be identified. Looking first to the criminal justice framework it will be suggested that the due process rights afforded to suspects and criminal defendants are not exercised in the same manner when evoked from a position of prevention. It will further explore whether it may be possible to keep the traditional framework effective and intact while also using predictive policing measures. Next the section will conduct a similar analysis from the framework of fundamental rights.

Finally, this analysis will conclude by returning to the examples of monitoring financial crimes and intelligence collection for counterterrorism, as briefly discussed in Chapter 1. It will be suggested that these frameworks offer some informative value as parallel or even related

enforcement regimes, in which collection of data and administrative, preventative mechanisms precede an actual harm. Despite the parallels, it will also suggest that though the practices may be parallel in methodology, the legal frameworks in which they operate are sufficiently tailored to the practices, which though imperfect allay many of the issues comparable to those encountered in predictive policing. It is the goal of this section to garner some insights into potential ways forward for the fair and effective use of predictive policing, in a manner consistent with individuals' rights.

As briefly discussed in Chapter 1, the use of criminal law to enforce sanctions for violations of other legal regimes, such as national security, has increased. Similarly, the enforcement of criminal law is increasingly being executed by administrative or civil means. It is argued herein that the use of predictive policing and the confluence of myriad data sets leads to a form of administrative monitoring of individual and community behaviors, for what may be considered suspicious in the lead-up to a criminal offense. Interestingly, in each of the jurisdictions analyzed, the test for what may be considered 'necessary' to justify intrusive police measures is relevant to legitimizing predictive policing. This 1. Demonstrates that societal perceptions of crime, risk, and harm have so evolved to accept these practices, and 2. The starting point in this assessment is to validate a non-proven, yet harmful police tactic. With predictive policing, behaviors that are not in themselves criminal, nor legally labelled as preparatory acts may in aggregation offer justification for police attention, which may then be followed by an official record of the encounter, further driving collateral consequences. The aggregation of human traits and behavior are transformed into numerical data which are purported to instruct the user as to what may be 'a risk.'

A core characteristic of administrative law enforcement, is the categorization of violations of law into general classifications or terms, which may utilized in a broad, sweeping way across large (innocent) portions of the population. One example of such enforcement is the use of a drunk driving checkpoint, in which regardless of individual behavior, all drivers passing through the point will be subject to a check. It is in essence the regulation of human behavior.[1] Before an act may reach the level of a criminal offense, behavior is monitored for compliance with norms that do not threaten future harms. This form of policing inherently accepts the notion that 1. There is a criminal behavior to be discovered, and 2. The only way to neutralize the risk is to submit the full, mostly innocent population to scrutiny. Another regulatory or administrative approach will be discussed below in the context of financial crime monitoring, in which pre-identified anomalous behavior may be an indicator of criminal acts. In many cases though however, the behavior indicates something which is already or has occurred, rather than the prediction of future behavior.

The unique situational place of predictive policing between these forms of policing is the lack of individual targeting, as in financial crime, but an avoidance of general blanket surveillance, more like counter terrorism. Instead, individuals are assessed based on the perceptions of a group of a certain type of persons, so categorized. Here the 'risky' behavior may be narrowed down to a subset of the population. It is then possible to avoid individual profiling as well as blanket surveillance, yet as discussed in Chapter 5, group profiling may be far more insidious. Such categorization of individuals risks relying on prejudice, stereotypes, and cuts of remedy to those harmed. It is harder to prove discrimination as a part of a group just as in the context of data protection, there is practicably less protection.

[1] Bernard Harcourt, 'After the Social Meaning Turn: Implications for Research Design and Methods of Proof in Contemporary Criminal Law Policy Analysis' (2000) 34 Law & Society Review 179, 186.

The notion of a risk society was discussed in Chapter 2, described as one in which crime may be seen as a risk that may be prevented or mitigated, if the relevant characteristics of crime can be identified in advance allowing for action by enforcement authorities before the crime act takes place. It may be viewed as an inversion of the crime control paradigm. This shift is distinct from detection of inchoate or preparatory crimes, but instead focuses investigatory powers on behavior that in itself is wholly innocent. In fact by seeking to prevent a future behavior, an individual may be viewed as the sum of constituent characteristics reduced into numbers, which may then be inferred as indicative of how they may behave in the future. Similarly, in using a risk assessment to create the profile of neighborhoods where crime is most likely to occur, individuals may even become viewed as a characteristic of place, lending weight to the logic that an individual may be considered a facet of a place. This is an inversion of reality but additionally a perverse method for determining suspicion of an individual's behavior. Predictive policing is built on a logic in which a human is a numerically constructed sum which is relevant to other aspects of reality as they exist as numerical values.

Several additional points in this logic may be seen as problematic and lead to the legal analysis of these harms. First, the approach taken in preventing crime totally disregards the autonomy and individuality of the person. Logic and moral principles aside, the conditional execution of free will of individuals is not only legally protected but is also at the core of most Western, liberal traditions. In comparable applications of using AI to make correlative assessments, as in the case of complex medical diagnoses, assessments are generally based on the measure of facts related to an identified or unidentified existing condition. This is a measure on reality based in verifiable facts without speculation as to what it may indicate for future, potential realities. In the case of making a crime prediction, there must be an assumption that any

individual fitting a crime profile (or suspect profile) based on his/her relation to the identified group, will act in the way the profile predicts. A numeric value is not representative of an individual, who is inherently multi-dimensional. By comparing them against a group profile, aspects of their character are imputed to fit the profile, creating additional facts that are not represented by the number. This is neither reflective of human behavior in reality, nor sufficient justification for police intervention in any of the legal systems assessed. As discussed in each of the chapters, but largely chapters 2 and 5, the use of unchecked data to make these determinations makes an unreliable technique outright untrustworthy. Bad data, inaccurate data, and biased data ensure that these largely unlawful forms of profiling are also likely to be inaccurate. It has been seen that it allows if not encourages harmful crime prevention programs, such as the Sensing Project in the Netherlands, described in Chapter 5.

Second, the harm principle is disregarded for the idea that a person in him/herself may *be* harmful. Briefly described in Chapter 3, this is deeply problematic. Harm, as the act of damaging the person, property, or interests of another, is a discreet act which may be punishable by the state. The presumption of innocence in each of the jurisdictions surveyed explicitly declares that individuals must be considered innocent of an offense, until found by a court to be guilty. The details of these procedures is very important to the analysis. Just as you cannot be an innocent person or a guilty person, you cannot be a harmful person. You may be a person who is innocent or guilty *of a crime*, just as you may affect harm on another. In the criminal law sense, these terms as adjectives are not appropriate characterizations of the person to carry legal consequences. In a context in which a person may be considered harmful, this is not a punishable offense according to criminal law. Rather the law is intended to make punishable certain offenses but not the essence of one's character. Predictive policing alters this construct by attempting to

categorize individuals according to their calculable risk, an approach that runs counter to the notion of legal certainty. Returning to the notion of a group profile, predictive policing now may categorize whole subsets of the population as being harmful.

All of this is intended to illustrate the drastic effects of predictive policing on crime control. The change of societal attitudes toward risk has allowed a new relationship between the individual and the police, the entry to the criminal justice system. As predictive policing ushers in these changes, it is further enhanced in its power by the novel use of AI and technology to truly weaponize a fear of crime.

These criticisms of predictive policing, which have been discussed at length through this work, are alone enough to inform a full study. However this thesis sought to take a further step to investigate how they play out in the legal setting, specifically vis-à-vis due process and fundamental rights protections. The main legal ramification of this problematic temporal shift in crime prevention looking to pre-crime indicators, means a lack of protections to individuals who may be the subject of predictive policing. The practice when applied may implicate numerous categories of personal data, may subject individuals and communities to undue police scrutiny or intimidation, and in some cases lead to police confrontation. However because no crime has occurred and in the case that no charge is made, there is no legal protection by which individuals may safeguard their rights against predictive policing. In each of the jurisdictions assessed this is true. The presumption of innocence (Chapter 3) applies to trial processes and though argued here as appliable to predictive policing, only really initiates at trial. In CoE countries, such as France, it may be possible to impute some suspect rights, but this is hardly codified in law. In the U.S., the presumption applies strictly to trial processes and is even a non-right in some contexts, such as sentencing hearings. Despite this, the collateral and legal damages of predictive policing know

no temporal limits. In the case of a reasonable suspicion, Chapter 4 discussed the supplanting of bona fide officer suspicion with statistical analysis, as in the U.S. and U.K. In the case of European countries, office suspicion is not uniformly constructed, yet the effect of a predictive risk assessment is not irrelevant to police patrols. However again, a criminal record does not reflect whether a human or machine observed suspicious behavior, only that police intervention ensued.

Indeed predictive policing sits outside the criminal justice framework, which not only has ramifications for the present, but may affect the due process and fair trial rights of individuals in future legal proceedings. This thesis has argued that the legal frameworks applied to predictive policing are problematic on multiple levels and in many cases legal frameworks do not even apply at the point of predictive policing, placing it into an extra-legal space that is antithetical to the foundations of criminal law. As the next section ill summarize, even when a framework may apply, tensions, overlaps, and gaps therein additionally hinder the effectiveness of legal protections.

Chapters 3-5 looked at the legal frameworks relevant to policing to determine how predictive policing may differ in practical application relative to the rights within the frameworks and what problems arise in attempting their implementation. The chapters were formulated to highlight the ways in which rights and standards overlap and collide in the context of predictive policing, using examples of particular rights. This sub-section will review the findings within those frameworks to compare the effects more comprehensively and posit ways in which broader trends may be detected and those rights reinforced in the face of predictive policing.

1. Lacking protections

The assessment of frameworks began with Chapter 3, which explored the effects of predictive policing on the traditional protection found within the presumption of innocence. Though applications of the presumption vary between the common and civil law systems, the substantive guarantee included therein was assessed as having been violated in each. The presumption of innocence should guard against 1. the use of arrest data which ends in acquittal, as well as 2. the prohibition on public officials acting or making statements prejudicially in a way that may implicate the guilt of an individual prior to trial. In the European context it is a fair trial right as well as a due process tenet at the core of criminal justice. In the U.S. it falls under the principle of procedural due process.

As predictive policing relies on police data as the most critical category of information, the inclusion of arrests or other brief forms of detention are necessarily included in what constitutes a 'suspicious' profile. However as has been discussed, not all police records are maintained in a uniform manner, even across jurisdictions. In instances in which an individual may be arrested and even charged, there is no guarantee that an eventual acquittal will appear in the police record. Instead, it is more likely that even if registered, the acquittal does not negate the arrest or the charge, which remain historic facts within the record. As the presumption of innocence protects an individual against intonations or actions indicating guilt in the case of an acquittal, and individual should have the right to not be treated as guilty for a charge which he/she is acquitted. This poses a problem in particular predictive policing programs, in which arrests make a particular individual more likely to be again arrested or stopped, per the feedback loop. This also applies to the actual effects of a police officer stopping an individual in public for some form of detention. The essence of the presumption requires that public authorities do not treat an

individual as guilty before found as such by a court, which clearly is not the case in a random police patrol. Though police may be acting under the auspices of criminal law in the manner of an investigation, which this thesis has described to be parallel in method, manner, and resulting information, there is rarely an investigation or charge. For this reason, the threshold is not met to trigger the protective effect of the presumption. The shirking of the presumption early in the course of policing also affects the fair trial right to the presumption at later stages, however at the point of predictive policing there is no claim to be made.

In each jurisdiction, it appears that in the context of the presumption predictive policing is situated in an extra-legal place. Though an individual may initiate and build a criminal record based on predictive patrols, there is no recourse to the presumption as the right is generally not triggered without a charge. In the case of an existing charge, should it have ended with acquittal, this should trigger the presumption however if the arrest remains in the record, then individual will be categorized as high risk. In both scenarios there is a real, legal harm but no reciprocal protection. Similarly, predictive policing affects police discretion and perception in any given situation by altering the relative balance of known information. Indeed, it was discussed that the threshold of suspicion across jurisdictions is in practice lowered by the use of predictive policing, as increasingly innocuous behavior may be more likely to be considered suspicious when a person or place fits a particular profile based on a huge universe of information inaccessible to the average person. Where the threshold for an individual's right is unmoved and unreachable in this context, the threshold for police is practically lowered, as the justification for police suspicion is already provided to a large degree by the information that he/she possesses in advance of observation. Because predictive policing uses a categorical assessment of crimes to guide police toward individuals with certain characteristics, a stop may be due to personal traits

or the environment in which they may be encountered. The suspicion of a potential crime is supplied by the predictive assessment, the role of the police officer is to use discretion to determine who may fit the profile of the suspicious. When applying so broad a profile against a population, it is likely that individuals will be disproportionately stopped by police in locations in which a risk assessment has identified a probable threat.

This raises questions of police procedure and due process. As mentioned, it is not only acute harms and criminal records that are affected by predictive policing, but any future trial will be deficient in fair trial rights for the defendant. The ability to challenge police practice which originated in AI programs is particularly difficult. The due process frameworks each enjoy varying doctrines of evidence law and criminal procedure, however the ability to challenge the testimony of an officer is necessarily impacted by the officer's inhuman repository of information even prior to have interacted with the defendant and the subsequent arrest. Without said information, the questioned behavior may have been seen for what it was, not criminal, and the entire interaction avoided. But this is not easy to prove.

Predictive policing also exacerbates existing harms already covered by a legal framework. Discrimination, as discussed in Chapter 5, has been defined as the unequal treatment of an individual either directly due to a characteristic of the individual or group, or as the result of an action that while perhaps neutral at face value, has the effect of systematically reaching a less advantageous result for certain groups.[2] The discussion on the right against discrimination as applied to traditional policing largely applies in the same manner to predictive policing with several caveats. First, traditional policing is relatively more transparent in how particular officers may arrive at a decision which is discriminatory in purpose. In the case of predictive policing,

[2] Nathalie Smuha, 'Beyond the Individual: Governing AI's Societal Harm' (2021) 10 Internet Policy Review, 7.

there is a much higher level of opacity against which police actions may be assessed. This is additionally problematic as there is frequently a belief in the objectivity of a risk assessment, which when often unverifiable is also less scrutinized. Second, the act of predictive profiling is inherently at odds with the right against discrimination. Where an individual may be deemed a degree more suspicious than others due to the correlation of characteristics that may amount to a group profile, there is a *de facto* discrimination. Whether it results in unequal treatment adverse to a particular group is not inherently present, in the case of policing this is often the result.

Finally, the way in which predictive policing may be least aligned with the non-discrimination legal framework, is the use of AI and machine learning in many predictive policing programs. The chapter briefly addressed four types of biases present in predictive policing. Of these four biases, human bias is the only one that is relevant to the assessment of discrimination by police in any of the jurisdictions analyzed. It is therefore near impossible to determine from where discrimination originates in a particular instance of predictive policing when various forms of machine bias may intertwine with human biases, to exacerbate their effects or mask their origins. This complicates the discussion of discrimination, as well as avoiding it through the use of accurate data, for instance.

In the case of predictive policing that relies upon AI, a method for identifying bias and correcting issues within a system or data set involves the collection of additional data. This works by both allowing for a test of the system, as well as more accurate results through the inclusion of a wider set of data. However as discussed in Chapter 5, the inclusion of additional data also risks violating the right to data protection of countless individuals, even those who are not directly affected by predictive policing, nor have any criminal record. Therefore, by attempting to cure the issue of discrimination in predictive policing, data protection is weakened.

Therefore looking even at frameworks which are directly applicable to predictive policing, there is still a legal dilemma in their use. In order to systematically rid an Ai system of bad data in order to curb discrimination, it may be necessary to violate the data protection rights of numerous more individuals. To protect the data protection right, it may be necessary to allow less accurate data sets and programs, meaning an increase in discriminatory results. The thesis has posited that the temporal shift with predictive policing makes it a practice practicably ungoverned in many aspects of policing, due process, and fundamental rights protections. Even where the framework may offer accountability and redress, as in the rights against discrimination and to data protection, they do not neatly apply in conjunction. Without these necessary protections, criminal justice is skewed toward the state.

B. Protections in Comparison

Following onto the conclusion that the legal frameworks traditionally applied to policing will not provide adequate protection to individuals, this section will return to the description of two other forms of administrative and data-driven enforcement, provided in Chapter 1. First, the case of monitoring for financial crimes will be compared as a form of administrative enforcement mechanisms for the detection of financial crimes. The use of data and categorical detection of anomalies will be compared to the use of a risk assessment to predict crime. Similarly, looking to the example of the collection information for the development of counter terrorism intelligence will be considered as a form of data mining of innocent behaviors, which may be indicative of future crimes.

Chapter 1 briefly discussed financial monitoring and counterterrorism as examples of regulatory enforcement schemes in the context of pushing predictive policing into the category

of administrative law. The argument is that both, which rely upon huge sets of data allow for the preventative function of law enforcement, in order to detect a crime in action or preparation. However it is additionally argued that the difference from policing is that they both 1. Sit within legal frameworks that are specifically tailored to their use, and 2. Target behavior already occurring. Despite this there are numerous similarities to be further examined below.

In the case of financial monitoring, transactions are monitored for suspicious activity that would indicate that a particular form of crime is occurring. Though it may also come upon false positives, the use of this monitoring is largely to detect crimes that are already in progress. Predictive policing on the other hand, is explicitly intended to predict a crime that might occur to cut off the opportunity for a perpetrator. Also unlike predictive policing however, this form of monitoring is generally aimed at individual behaviors. Though predictive policing seeks to root out individuals who may commit crimes, it is usually only possible through the use of a group focused surveillance or monitoring.

Similarly, in counterterrorism there are acts which may be considered indicative of a terrorist plot that has already been birthed or even set in motion. Again, there are false positives and instances of state surveillance, but this form of monitoring is a manner of identifying suspicious behavior by individuals by scanning the population. In counter terrorism there are many acts that are considered preparatory and therefore already determined by law to be criminal, however many behaviors or acts which may be seen as suspicious and indicative of planning some terrorist plot are in themselves wholly innocent, as in predictive policing. Interestingly, the use of criminal law to criminalize certain behaviors which are themselves not criminal for the means of achieving counter terrorism is a full subject for study unto itself outside the scope of this work.

In both cases, financial monitoring and counterterrorism, the second big difference is that there are legal frameworks intended to regulate these forms of enforcement. In the case of financial monitoring there is regulation as to the standards that must be reached, by whom, and the acts considered to be criminal. It is achieved through a public-private approach which relies upon a mix of state enforcement and self-regulation and reporting, aimed at ensuring the behavior of the enforcement agencies as well as the curbing of financial crime. Similarly, in the case of counterterrorism, there are acts and enforcers which are responsible for the detection of terrorist crimes, who must behave according to national security law. In both cases, the enforcement body is held to specific regulations, which also dictate the ways in which evidence, punishment and redress is handled.

In predictive policing, on both counts this is not the case. As stated, predictive policing does not aim to detect ongoing criminal acts, though it may do so, but instead it is meant to deter and fully prevent the commission of crime by taking away the opportunities. This requires predicting future behavior and acting upon common characteristics that otherwise have no value in the criminal law nor indicate any wrong-doing. In essence, there is no crime occurring but because an individual may commit some crime, a whole group may be subject to police scrutiny. Similarly, predictive policing differs from the above examples because it is not subject to a tailor-made legal framework. For the foregoing chapters it has been demonstrated that applying the legal frameworks and standards to which policing generally falls subject is wholly inadequate and additionally problematic in the case of predictive policing. It therefore sits outside of and sometimes straddles multiple legal regimes, but finds no home in any of them. In the interests of scope, length, and time, this thesis does not delve any further into this comparison, but to say that

predictive policing may join the ranks of administrative criminal law enforcement, yet as currently exists, still maintains some notable differences.

C. Concluding Reflections

Taking these findings together demonstrate a substantial and substantive shift in the role of police within society, their role in court procedures, and their power relative to individuals. This thesis has argued that the use of predictive policing does not fit directly or exclusively within a rights framework nor does any single framework adequately function in the context of crime prevention on this scale. It has even demonstrated that certain applications of rights cannot function together. In each of the frameworks and rights discussed, the opacity of predictive policing, its use of data, and the effects on individual is highly reliant on context and far from uniform in practice. This is true across the jurisdictions analyzed as traditional tests by courts to indicate where a violation of law has occurred have not yet been applied to predictive policing, however it appears that these tests do not adequately engage neither the principles at the core of the rights framework nor the reality of predictive policing in practice. However in addition to the protections in jeopardy, predictive policing leads to harms that include over- and under-policing of neighborhoods, discrimination, surveillance, egregious stops, the generation of unwarranted police records, and even more potently, the collateral consequences that accompany each.

Discussed in Chapter 2, the police have traditionally held the role of enforcer of public order, safety, and crime control. This power, endowed to them by the state has largely depended on their legitimacy as held in the eyes of the policed populace. The majority of policing is done on the basis of consent and cooperation, and the expectation by the policed is that there in exchange for good faith cooperation, this is a return via the respect of individual rights. Where police

without the use of risk assessments rely on the transaction between individuals and an even exchange of information in the first instance, predictive policing exposes the individual to an officer in a highly imbalanced way, via the access to their private information and data that may reveal much more than a single observation may provide. The traditional role of the police then, to maintain and protect society has transformed through the self-acquired duty to police individuals' non-criminal behavior.

In determining what we normatively hold to be indicative of a risk, that is for instance, an anomalous behavior that may not fit the behavior of a group profile, police have reformed the bounds of their discretion to determine what is acceptable behavior absent criminal acts. This may be considered as equating to the policing of social norms and determining who is different enough to be considered problematic in the context of public interactions. Though the public fear and conception of crime and risk may have opened the door to this new, intrusive form of regulation, in large part it is now being wielded against the population who sought an emphasized perception of security to begin.

As has been argued throughout, the flattening of behavior and social norms to statistical calculations misses the value and meaning of behavior, particularly when applied to law. Not only is the translation from socially defined acts into numerical value problematic, using these numbers to make legal determinations further perverts the social value that law holds.[3] In this way criminal law is in practice defined by the language[4] used to define what may be seen as

[3] Pamela Ugwudike, "AI Audits for Assessing Design and Building Ethical Systems: The Case of Predictive Policing Algorithms," *AI and Ethics*, May 30, 2021.
[4] Mireille Hildebrandt, 'Law as Information in the Era of Data-Driven Agency' (2016) 79 The Modern Law Review 1, 3-9.

criminal or suspicious, in effect "'mak[ing]' social reality by creating categories of information that translate into actionable behavior, creating at the same time grounds for intervention.[5]

Whereas a crime was generally the threshold for an investigation prior to predictive policing, increasing numbers of lesser offences are becoming punishable. However punishment in this context is no longer conceived of exclusively as a prison sentence or parole. Instead, individuals who are swept up in a predictive policing patrol may have a newly established police record as a result of a gratuitous stop for questioning or a warning. Even without an arrest this information become part of a predictive feedback loop, in which the individual will continue to generate recorded police interactions in perpetuity. Similarly, where an arrest for petty crimes may ensue, it is more likely that an individual will pay a fine or accept a plea deal than receive audience in a court. This cuts off the ability of the individual to make a case before a judge, which in common law systems ensures that predictive policing practices will not be subject to real challenge, and it further disallows any opportunity to appeal a decision. As gatekeepers to the criminal justice system, police have expanded their role from sentries at the gate to scouts bringing individuals newly to the entrance. This may be argued as a widening of criminal law in totality, expanding its enforcement into administrative law that not only insidiously makes more people suspects for less, but also sprouts new ways for enforcement to be enacted.

Finally, this leads to a shift in relative power constructs between the police and the policed. Police hold power both in the monopoly of force, but also a level of information that is unparalleled by the average individual. Where behavior or acts that have no value vis-à-vis criminal become the target of police scrutiny, there is little regard for legal certainty.[6] In the

[5] Matthias Leese, 'Enacting Criminal Futures: Data Practices and Crime Prevention' [2022] Policing and Society, 5.
[6] Mireille Hildebrandt, 'Criminal Law and Technology in Data Driven Society', *Oxford Handbook of Criminal Law* (Oxford University Press 2013), 15.

sense that law is relational, it is important that deterrence and prevention are not seen as mutually exclusive to fairness and justice.[7] The use of predictive policing also alters the application of the equality of arms. Police provide the impetus which may set the events in motion that lead to a criminal trial. The burden of proof is also effectively shifted toward the favor of the officer in the case of predictive policing. Should a charge get to a trial and individual may be faced with information that an officer acquired from the use of predictive policing software which will be at best inaccessible and at worst, unavailable. From the point of use of the risk assessment, and officer is already in possession of knowledge which may affect his/her discretion, the subsequent forming of suspicion, and all interactions that follow.

In concluding, it is inarguable that predictive policing has not been proven as necessary or effective at preventing crime, however many cases of its potential harms are documented. This thesis has belabored the conclusion that existing legal frameworks are not sufficient to counter these harms and as a result, individuals have become subject to a form of policing that has no real counterweight in due process. The choice of jurisdictions has illustrated varied levels of predictive policing, with the EU presently debating whether to ban the practice totally. Despite this, new forms of crime control, in conjunction with staggering advances in technology, will continue globally and the ability to adequately refresh legal frameworks to be applicable will remain.

[7] Id at 11.

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