Predictive Policing and the *Charter*

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ABSTRACT

Predictive policing technology uses algorithms trained on past crime data to predict where crime is likely to occur in the future. Given the historical over-policing of minority and low-income communities, there is a concern that this bias will be perpetuated and amplified in the future if the algorithms are not corrected to account for this. Furthermore, there is a concern that when police are deployed to areas flagged as "high-crime," they will rely on these predictions as justification for detaining individuals — leading to an erosion of s. 9 *Charter* protections. This paper draws on Canadian and American case law to argue that as long as courts uphold the individualized suspicion requirement for investigative detention, s. 9 rights will likely not be eroded. Given the widespread issues with validating the accuracy of predictive algorithms and the unwillingness of courts to allow generalized suspicion to justify detentions, these tools will likely be given limited weight in the reasonable suspicion analysis moving forward.

I. INTRODUCTION

Police increasingly rely on data that they and others collect to predict where crime is most likely to occur. This practice is not entirely new. Police have always relied on crime location data to make predictions in the service of effective and efficient law enforcement.[1] In the 1990s, under Commissioner William Bratton, the New York Police Department

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1 Elizabeth E. Joh, "Policing by Numbers: Big Data and the Fourth Amendment" (2014) 89:1 Wash L Rev 35 at 39 [Joh, "Policing by Numbers"]; Andrew Guthrie Ferguson, "Crime Mapping and the Fourth Amendment: Redrawing 'High-Crime Areas'" (2011) 63:1 Hastings LJ 179 at 207 [Ferguson, "Crime Mapping"].

introduced the CompStat system, in which deployments were guided by weekly crime data.[2] More recently, police have begun using crime prediction systems employing artificial intelligence-based algorithms to make predictions about where and when crime is likely to occur in the near future.[3]

Some commentators have argued that the use of these algorithms will lower *Charter*[4] protections for individuals who live in certain "high-crime" areas.[5] This proposition stems from the reality that predictive algorithms are trained on historical crime data,[6] and that this will perpetuate the over-policing of low-income and minority communities by consistently flagging them as "high-crime" areas that law enforcement is sent to.[7] And although police require reasonable suspicion to conduct investigative detentions, the concern is that the predetermination of an area being "high-crime" will put the thumb on the scale of that analysis, requiring less suspicious behaviour from the detainee to justify detention than if they had been in an area that wasn't flagged as "high-crime."[8]

I argue, in contrast, that provided the Supreme Court's requirement of individualized suspicion for investigative detention remains robust, area-based predictive police algorithms will likely not erode the protection in s. 9 of the *Charter* against "arbitrary detention."[9] Given the issues inherent in

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2 Joh, "Policing by Numbers", *supra* note 1 at 43–44.

3 Artificial intelligence is defined as the programming of machines to be capable of intelligent, predictive behaviour. Machine learning is one application of artificial intelligence, which allows computer programs to learn from their experience. See Elizabeth E. Joh, "Feeding the Machine: Policing, Crime Data, & Algorithms" (2017) 26:2 Wm & Mary Bill Rts J 287 at 287, note 2 [Joh, "Feeding the Machine"].

4 *Canadian Charter of Rights and Freedoms*, Part I of the *Constitution Act, 1982*, being Schedule B to the *Canada Act 1982* (UK), 1982, c 11 [*Charter*].

5 Ferguson, "Crime Mapping", *supra* note 1 at 214; Kate Robertson, Cynthia Khoo & Yolanda Song, "To Surveil and Predict: A Human Rights Analysis of Algorithmic Policing in Canada" (1 September 2020), online (pdf): *Citizen Lab: Transparency and Accountability in Research* <citizenlab.ca/wp-content/uploads/2020/09/To-Surveil-and-Predict.pdf> [perma.cc/P5MN-FAJ5].

6 Danielle Ensign et al, "Runaway Feedback Loops in Predictive Policing" (Paper contributed to the Proceedings of Machine Learning Research Conference on Fairness, Accountability, and Transparency, New York City, 23 February 2018) (2018) 81 Proc Machine Learning Res 1.

7 Although there are algorithms that use data to target individual suspects or criminal networks, this paper deals exclusively with area-based predictions.

8 Ferguson, "Crime Mapping", *supra* note 1 at 211.

9 *Charter*, *supra* note 4, s 9.

predictive policing algorithms and the reluctance of courts to recognize generalized suspicion as justification for infringement of liberty, the designation of an area as "high-crime" will likely play a limited role — if any — in the reasonable suspicion analysis moving forward.

I elaborate this argument as follows. First, I canvass current predictive policing programs and the issues they face with regard to data collection and algorithm bias. Second, I discuss case law regarding the constitutional implications of predictive technologies. Finally, I suggest a variety of ways that the courts may incorporate these technologies into the s. 9 analysis. These include complete exclusion of the factor, an additional onus on the Crown to show that the predictive information relied upon was accurate and non-discriminatory, and a move towards quantifying reasonable suspicion.

II. PREDICTIVE POLICING

A. Overview of Existing Programs

The most widely used predictive police algorithm in the United States is called PredPol.[10] It uses three historical variables in order to predict where and when future crime is likely to occur: crime type, date and time, and location.[11] The algorithm — originally developed on models of seismic activity[12] — uses these data points to try and predict where "aftershocks" of crime might occur in the future.[13] It provides officers with one day's worth of "hotspots" represented as 500 by 500 ft squares on a map.[14] Officers are then able to prioritize the flagged areas during their patrols. HunchLab is another machine learning algorithm that includes variables such as weather, major sporting events, moon phases, and the location of bars[15] to predict future crime hotspots. Even though the property crime algorithms are relatively new, area-based algorithms have now expanded to predicting violent crime.[16]

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10 Joh, "Feeding the Machine", *supra* note 3 at 291.

11 *Ibid.*

12 Kristian Lum & William Isaac, "To Predict and Serve?" (2016) 13:5 Significance 14 at 18.

13 Ensign, *supra* note 6 at 2.

14 Joh, "Policing by Numbers", *supra* note 1 at 44.

15 Robertson, Khoo & Song, *supra* note 5 at 41.

16 Andrew Guthrie Ferguson, "Policing Predictive Policing" (2017) 94:5 Wash UL Rev 1109 at 1137–138.

PredPol has published results indicating that the use of their technology leads to significant drops in crime rate,[17] however, their data has been met with skepticism.[18] A 2019 survey of 50 agencies that have used PredPol found that none of them had produced studies validating the effectiveness or accuracy of the tool.[19] Furthermore, hundreds of academics signed an open letter emphasizing that there is no academic consensus that the research behind PredPol is either ethical or valid, and should always be weighed against literature to the contrary.[20]

Studies on the efficacy of predictive policing programs lack internal consistency because of selection bias and their inability to isolate variables and reproduce results.[21] There is no known baseline of actual crime or control group to evaluate the efficacy of the tool against, and the only population that data is being collected on is the one selected by the algorithm itself. This provides a fundamental challenge to this technology—given the naturally occurring fluctuation of crime over time, separating correlation from causation in studies of predictive policing becomes exceedingly difficult.[22]

If the goal of predictive policing is to effect short-term crime prevention, then causal inference is not necessary: the technology still helps police to allocate their resources efficiently. However, without knowing what causes the observed crime patterns, there is no way to know which interventions

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17 Zach, "PredPol Partners LAPD-Foothill Records Day Without Crime!" (22 February 2014), online (blog): *PredPol* <www.predpol.com/predpol-partners-lapd-foothill-records-day-without-crime/> [perma.cc/8RRQ-XRZF].

18 Two randomized controlled trials of PredPol found an average crime reduction of 7.4%, see Litska Strikwerda, "Predictive Policing: The Risks Associated with Risk Assessment" (2020) Police J: Theory, Practice & Principles 1 at 4.

19 Beryl Lipton, "'It's PredPol, and it's going to reduce crime': Agencies take algorithmic effectiveness on faith, with few checks in place" (5 November 2019), online: *MuckRock* <www.muckrock.com/news/archives/2019/nov/05/predictive-policing-lacks-accuracy-tests/> [perma.cc/EJK8-EK8R].

20 "Over 450 academics reject Predpol" (8 October 2019), online (blog): *Medium* <medium.com/@stoplapdspying/over-450-academics-reject-predpol-790e1d1b0d50> [perma.cc/M6S2-U5UL].

21 Ferguson, "Policing Predictive Policing", *supra* note 16 at 1159–160.

22 Joh points out that this is the predictable outcome of mining big data to find correlations — it bypasses the need for a hypothesis and causality-testing in research. The insights "are useful in their predictive value even though they provide no causal explanation [as to why the correlation exists]." See Joh, "Policing by Numbers", *supra* note 1 at 41–42.

(police or otherwise) would most efficiently reduce crime in the long term.[23] There is also a risk that hostility towards police may increase (and crime rates with it) if police are repeatedly deployed to the same area without an understanding of the causal factors underlying crime patterns.[24] Predictive police algorithms have continued to proliferate despite these concerns.

The Vancouver, Toronto, and Edmonton police agencies have already formed relationships with companies that manufacture predictive policing software.[25] The Vancouver Police Department uses GeoDASH to predict break-and-enters. Similar to PredPol, it uses historical police data to generate location-based forecasts every two hours for 100 and 500-metre-squared areas. Its algorithm uses four data inputs — type of crime, location of crime, date, and time — and only relies on cases triggered by civilian complaints.[26] If an area is forecast as high-risk, officers will be sent to patrol the area to "deter criminal activity" and look for "suspicious activity."[27] However, in the case of already over-policed areas such as the Downtown Eastside, some zones are excluded from the forecast so that even if they are flagged as high-risk areas, officers won't be sent back there repeatedly.[28]

Although a representative from the Toronto Police Service stated in 2019 that they are not yet using algorithmic predictive policing technologies,[29] they have access to Environics Analytics and IBM's software, which have data mining, analytic, and predictive abilities geared towards crime prediction. They have indicated that they will not implement a predictive policing program until there is alignment with other governmental strategies for their use.[30]

Edmonton Police Service has also been developing a digital policing platform with IBM. On their website, IBM indicated that this work would form the "building blocks" for predictive analytics intelligence.[31]

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23 Strikwerda, *supra* note 18 at 11–12.

24 Janet Chan & Lyria Bennett Moses, "Is Big Data challenging criminology?" (2016) 20:1 Theoretical Criminology 21 at 33.

25 Robertson, Khoo & Song, *supra* note 5 at 42–45.

26 *Ibid* at 42.

27 *Ibid* at 43.

28 *Ibid*.

29 *Ibid* at 45.

30 *Ibid*.

31 "Edmonton Police Service" (October 2018), online: *IBM* <www.ibm.com/case-studies/edmonton-police-service-hybrid-cloud-integration-crime> [perma.cc/7Y88-QGDD].

B. Problems with Data Collection

Although algorithmic-based decision making offers greater accuracy and objectivity in theory, much scholarship has pushed back on reliance on algorithms as a panacea. Mathematicians and lawyers alike have studied how algorithmic outputs can vary based on the bias of the data inputs and even the factors considered in any given algorithm itself. In terms of reliability, crime data is particularly unrepresentative and incomplete.[32] Murder and auto theft are reported more consistently than sexual assault,[33] and reporting also varies by class, race, and ethnicity. Police officers also wield immense discretion in deciding where to patrol and whether to arrest or lay charges.[34]

These deficiencies may be amplified when crime data is fed into machine-learning algorithms. In one study, drug crime arrest data from the Oakland Police Department was used to simulate PredPol's accuracy in predicting drug crimes.[35] The PredPol algorithm (utilizing historical crime data) was applied every day for a year, and each grid was recorded with how many times it was flagged for targeted policing by the algorithm. Outcomes were compared to a map of the area created by a self-reported survey of drug use elicited from the 2011 National Survey of Drug Use and Health.[36] This data represented a more accurate base rate of illicit drug users in the city. The areas that PredPol flagged were predictably skewed towards non-white and low-income neighbourhoods, reinforcing the *ex-ante* pattern of policing rather than accurately representing the true geographic distribution of offending.

The researchers noted that this simulation relied on the assumption that increased policing in an area would not change the number of crimes discovered in that same area.[37] They conducted an additional simulation that increased the number of crimes discovered in areas targeted for policing, which then became part of the data set used to predict future crimes. The effect of additional crimes being observed at targeted locations

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32 Joh, "Feeding the Machine", *supra* note 3 at 295–96; P Jeffrey Brantingham, "The Logic of Data Bias and its Impact on Place-Based Predictive Policing" (2018) 15:2 Ohio St J Crim L 473 at 474–79.

33 Ferguson, "Policing Predictive Policing", *supra* note 16 at 1146.

34 Joh, "Feeding the Machine", *supra* note 3 at 299.

35 As noted above, PredPol's algorithm does not incorporate arrest data. This is one limitation of the simulation.

36 Lum, *supra* note 12.

37 *Ibid* at 18.

is that the algorithm becomes more confident that most crime is located in the areas that it has been targeting historically. However, the more positive feedback that occurs, the more divergent future predictions become from the baseline of actual crime. In this case where "selection bias meets confirmation bias,"[38] algorithms are vulnerable to runaway feedback loops.

C. Algorithmic Neutrality

Studies on algorithmic decision-making in other domains have shown that creating neutral algorithms, *i.e.*, algorithms that do not artificially favour or disfavour certain immutable individual characteristics, is very difficult. In a recent review of employee dismissal cases, reasonable notice periods for employee dismissal were reviewed to determine if there were statistically significant differences between awards given to female and male plaintiffs.[39] A data set of over 1,700 decisions was collected and coded for factors commonly used in decision-making (character and length of employment, age of the employee, availability of similar employment, compensation, etc.).[40] No direct evidence of gender differences in the outcome of reasonable notice period awards was found when adjusted for the other factors.[41]

The author notes that although there was no explicit gender bias in the data set, that does not mean that it is not present. Rather, the gender differences are manifested through the factors themselves, such as job type and compensation. For example, clerical workers—who received less than other workers on average—are disproportionately female.[42] Furthermore, the general wage gap between female and male workers[43] manifests as lower compensation for female plaintiffs. Thus, a decision-making algorithm

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38 *Ibid* at 16.

39 Anthony Niblett, "Algorithms as Legal Decisions: Gender Gaps and Canadian Employment Law in the 21st Century" (31 July 2020), online (pdf): *SSRN* <dx.doi.org/10.2139/ssrn.3702495> [perma.cc/6RBP-VGTT].

40 This includes the factors from *Bardal v Globe & Mail Ltd*, [1960] OJ No 149, 24 DLR (2d) 140, as well as others at the discretion of the author, see Niblett, *supra* note 40 at 8.

41 Niblett, *supra* note 40 at 4.

42 *Ibid* at 13.

43 Nicole M. Fortin, "Increasing Earnings Inequality and the Gender Pay Gap in Canada: Prospects for Convergence" (2019) 52:2 Can J Econ 407 at 415.

based on the law will continue to reproduce systemic biases even though on the face of the data it is 'gender-neutral.'[44]

The issue of correlative factors acting as a proxy for immutable characteristics has also been shown to persist in algorithms that predict risk scores for offenders. In a study of the COMPAS software for sentencing, black offenders were twice as likely to be misclassified at a higher risk of violent recidivism than white defendants.[45] This analysis controlled for prior crimes, future recidivism, age, and gender; the algorithm itself did not include race as a factor.

Courts have also recognized that algorithmic decision-making may be biased. In *Ewert v Canada*,[46] the applicant, Mr. Ewert, challenged Correctional Services Canada's use of algorithmic risk assessment in making decisions regarding prison conditions, access to services, and parole. Mr. Ewert claimed that since their validity had not been tested with regard to Indigenous offenders, that the Correctional Services of Canada had breached their statutory duty to "take all reasonable steps to ensure that any information about an offender that it uses is as accurate… as possible." [47]

Expert evidence was presented at trial which showed that not only did the actuarial tests suffer from cultural bias (and were therefore not valid predictors when applied to Indigenous inmates),[48] but that Correctional Services of Canada had not taken steps to research and improve upon those tools despite being aware of their potential for bias.[49] The Supreme Court of Canada determined that although the use of the tools did not impact Ewert's *Charter* rights, it was a breach of the Correctional Services of Canada's statutory duty to ensure that the tools they rely on when making a decision about an offender are as accurate as possible.[50]

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44 Niblett, *supra* note 40 at 16.

45 Julia Angwin et al, "Machine Bias" (23 May 2016), online: *ProPublica* <www.propublica.org/article/machine-bias-risk-assessments-in-criminal-sentencing> [perma.cc/9YP3-5DMJ]. See also Joh, "Feeding the Machine", *supra* note 3 at 294–95.

46 2018 SCC 30 [*Ewert* SCC].

47 *Ewert v Canada*, 2015 FC 1093 at para 80 [*Ewert* FC], citing the *Corrections and Conditional Release Act*, SC 1992, c 20, s 24(1).

48 *Ewert* FC, *supra* note 48 at para 52.

49 *Ibid* at paras 71–73.

50 *Ewert* SCC, *supra* note 47 at para 80.

D. Addressing Algorithmic Bias

Given that the bias present in input data described above is largely a reflection of human decision-making, some academics have argued that instead of throwing out algorithmic tools altogether, they should be adjusted to correct for some of that bias in the hopes of making better decisions. Brantingham, for example, examined how place-based predictive policing algorithms responded to one type of crime rate bias: the upgrading and downgrading of crime. Building on social science research, Brantingham hypothesized that implicit bias leads police to minimize the interests of non-white crime victims (downgrade the crime) and maximize the liability of non-white suspects (upgrade the crime).[51] The impact is reversed in the case of white individuals. The downstream effect of this implicit bias leads to higher risk-profiles being generated for certain suspects/crimes, and in practice, to over-policing of minority communities and under-policing of white communities — the precise concern raised by many legal experts and advocacy groups.[52]

Brantingham ran two sets of experiments where he sequentially upgraded and then downgraded crimes from 2% to 20%, observing the effect on the predictive policing model.[53] He found that when data bias was introduced to downgrade crimes (ex from aggravated assault to assault simpliciter), the risk-estimation went down as well. When crimes were upgraded, the risk estimation went up. However, the change in risk did not change beyond natural variation unless the biases impacted over 20% of the dataset.[54]

Brantingham's study is helpful in showing how predictive algorithms may be adjusted to account for bias in officer's perception of crime. However, it also illustrates the difficulty with putting the cart before the horse in such adjustments. How can we determine the extent to adjust predictions if there is no initial quantification of the amount of bias that is existing in the system? There is an inherent difficulty in altering inputs to produce less-biased outcomes if the amount of bias that you are adjusting for is quantitively unknown.

A study of bail decisions attempted to address this difficulty in pre-trial release predictions. It began with an analysis of bail decisions to determine

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51 Brantingham, *supra* note 32 at 476.

52 Robertson, Khoo & Song, *supra* note 5.

53 Brantingham, *supra* note 32 at 478–80.

54 *Ibid* at 481.

what factors judges were giving undue weight towards. The authors found that judges tended to over-weigh the current charge defendants are facing when making release decisions: they treated high-risk defendants as low-risk if the current charge they are facing is minor, but erred on the side of detaining low-risk defendants if the current charge they face is more serious.[55] The researchers accordingly trained an algorithm to make bail decisions adjusting for the perceived human error.[56] They found that when applied to new scenarios, the artificial judge reduced the subsequent crime rate as effectively as human decisions while imposing 28.8% less detention than human judges.[57]

Scrutiny of how human error influences and is dealt with by predictive algorithms should also extend to ensuring that the algorithms being relied upon are not perpetuating the problem of over-policing minority communities.[58] An officer's justification for detaining individuals must be *Charter* compliant, and therefore must not rely on immutable characteristics of a suspect.[59] Police services in Canada have had the benefit of observing some of the unfortunate outcomes of predictive policing in the United States and are approaching this technology with those concerns in mind.

The Vancouver Police Department, for example, has been monitoring their GeoDASH algorithmic prediction system for areas that become, or may become, over-represented in their forecasts.[60] Officer training also stresses that the forecasted crime models cannot form independent grounds for a street check.[61] The City of Edmonton has also shown that it is aware of the potential issues with predictive policing. It has requested meetings with the experts at the Alberta Machine Intelligence Institute (Amii) to discuss how to reduce bias when it comes to machine learning tools.[62] One

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55 Jon Kleinberg et al, "Human Decisions and Machine Predictions" (2018) 133:1 QJ Econ 237 at 284.

56 The study's obvious limitation is that while it can calculate the judge's "correctness" of deciding to grand bail based on whether conditions are breached, it cannot calculate the counterfactual — the effect that jailing defendants otherwise released would have been. See Kleinberg et al, *supra* note 56 at 256.

57 *Ibid* at 286.

58 See generally *R v Le*, 2019 SCC 34 at para 95 [*Le*].

59 *R v Chehil,* 2013 SCC 49 at para 43 [*Chehil*].

60 Robertson, Khoo & Song, *supra* note 5 at 43–44.

61 *Ibid* at 44.

62 Cory Schachtel, "More Data, More Problems: The Edmonton Police service reaches out to ensure it doesn't reach too far" (5 June 2019), online: *EDify* <edifyedmonton.com/urban/innovation-technology/more-data-more-problems> [perma.cc/W67H-A6XB].

of the directors of Amii noted that they were informed of the problem of feedback loops and open to modifying data in order to avoid the creation of positive feedback loops which send officers back to marginalized communities.[63]

Ultimately, algorithmic decision-making is only as good as the inputs it receives. Area-based predictive police technologies must take into account and adjust for bias in the data it uses in order to be *Charter* compliant and lead to better decision-making. Until then, their usefulness in crime prevention and as a factor in legal decision-making will be limited.

III. CONSTITUTIONAL IMPLICATIONS

A. Reasonable Suspicion and the *Charter*

S. 9 of the *Charter* protects an individual's right to be free from arbitrary detention.[64] The Supreme Court has recognized three categories of detention: physical restraint, psychological restraint with legal compulsion (where there are lawful consequences for not complying), and psychological restraint without legal compulsion.[65] Psychological restraint without legal compulsion arises where police conduct leads a reasonable person to believe that the choice to not comply does not exist.[66]

In *Grant*,[67] the Supreme Court identified a number of factors that may be taken into account in order to determine whether someone has been detained under this category. These include how focused or coercive the police inquiry was, the nature of the language used by the officer, and the characteristics of the accused (their age, relative stature, minority status, etc.).[68] If the totality of the circumstances would lead a reasonable person to believe that they had no choice but to cooperate, then detention will be made out and s. 9 protections will be triggered.

Police have a common law power to detain individuals for investigative purposes.[69] In deciding whether an investigative detention is lawful under s. 9, courts examine whether police had reasonable suspicion to detain. The

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63 *Ibid.*

64 *Charter*, *supra* note 4, s 9.

65 *R v Therens*, [1985] 1 SCR 613 at 641–44, [1985] SCJ No 30.

66 *R v Grant*, 2009 SCC 32 at paras 28–32 [*Grant*].

67 *Ibid.*

68 *Ibid* at para 44.

69 *R v Mann*, 2004 SCC 52 at para 45 [*Mann*].

reasonable suspicion standard requires articulable suspicion of why an individual is possibly engaging in some criminal activity.[70] The reasons for suspicion must be objectively discernable facts—something more than a mere hunch but less than reasonable and probable grounds.[71]

The Supreme Court has been clear that "generalized suspicion" alone does not provide reasonable suspicion for police to detain individuals. In *R v Mann* the Court stated: "The presence of an individual in a so-called high crime area is relevant only so far as it reflects his or her proximity to a particular crime."[72] Presence in a high-crime area without more will not be accepted as a lawful detention.[73] Furthermore, factors in combination with a high-crime area such as "refus[al] to make eye contact" and "repeated looks at the police car" while walking in a high-crime area are not enough to ground a lawful detention.[74]

The Supreme Court dealt with how predictive policing intersects with the reasonable suspicion analysis as it applies to an individual in *R v Chehil*. In *Chehil*, the RCMP targeted the defendant's airline luggage with a sniffer dog search because his flight manifest matched the RCMP's drug-courier profile.[75] At trial, it was found that the factors relied upon by the police did not meet the threshold of reasonable suspicion to justify a sniff search. This amounted to a s. 8 breach, and the evidence was excluded under s. 24(2). This finding was reversed upon appeal. The Supreme Court affirmed on appeal, finding that although a "constellation of factors" made up of characteristics that may generally apply to innocent people will not be enough to ground reasonable suspicion,[76] the factors which made up the drug-courier profile, when considered as a whole, went beyond generalized suspicion and to individual factors enough to constitute a basis for reasonable suspicion of Mr. Chehil.

In the entrapment context, a 5-4 majority of the Supreme Court recently affirmed in *R v Ahmad* that police must have reasonable suspicion over a sufficiently particularized place or individual before presenting an

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70 *R v Kang-Brown*, 2008 SCC 18 at para 75.

71 *Chehil*, *supra* note 60 at paras 26–27.

72 *Mann*, *supra* note 70 at para 47.

73 *Le*, *supra* note 59 at para 132.

74 *R v Austin*, [2015] OJ No 5374 at para 37, 125 WCB (2d) 252.

75 *Chehil*, *supra* note 60 at paras 4, 8–9.

76 *Ibid* at para 30.

opportunity for a person to commit an offence.[77] The Court found that a phone number used in a dial-a-dope investigation counts as a "place" for the purposes of the entrapment analysis.[78]

The majority explained that the "target" to which reasonable suspicion attaches is context-dependent.[79] In the case of sniffer dog searches of an individual (such as in *Chehil*), reasonable suspicion must attach to the individual person.[80] In the context of dial-a-dope investigations, reasonable suspicion can attach to a phone number (or narrowly defined virtual area).[81] Notably, the majority did not overrule *Barnes,* which allows officers to conduct *bona fide* investigations by randomly approaching individuals with an opportunity to commit an offence in a physical area where it is reasonably suspected that crime is occurring.[82]

In dissent, Justice Moldaver points out that *bona fide* investigations ultimately rest on the generalized, location-based reasonable suspicion that was carved out by *Chehil* in favor of an individualized approach.[83] The majority maintains that the individualization requirement of reasonable suspicion is consistent with *Barnes*, so long as places are targeted using a "sufficiently particularized constellation of factors."[84] Thus, in the entrapment context, police solicitation may be justified based on reasonable suspicion of a targeted area rather than an individual. However, given the majority's distinction that sniff-searches still require individualized suspicion of the person, it is unlikely that this approach will apply to the context of investigative detention and s. 9 cases.

Given that few police departments in Canada have adopted (or are thinking of adopting) area-based predictive policing, their precise impact on law enforcement decision-making and subsequent judicial treatment has yet to percolate through *Charter* jurisprudence. Looking to the jurisdiction of the United States, where predictive policing technologies have been in use for much longer, provides insight into how judges are responding to the technology and its constitutional implications.

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77 2020 SCC 11 at paras 4, 20–21 [*Ahmad*].

78 *Ibid* at para 42.

79 *Ibid* at para 49.

80 *Ibid*.

81 *Ibid* at 48.

82 *R v Barnes*, [1991] 1 SCR 449 at 463, [1991] SCJ No 17.

83 *Ahmad*, *supra* note 78 at para 129.

84 *Ibid* at para 48, citing *Chehil*, *supra* note 60 at para 30.

B. *United States v Curry*

In *United States v Curry*,[85] a full panel of the Fourth Circuit heard a Fourth Amendment case which reckoned (to some extent) with the applicability of predictive algorithms in determining the reasonableness of police action.

The Fourth Amendment protects individuals from unreasonable searches and seizures.[86] It has also been interpreted to provide constitutional protections to stops and arrests, with arrests requiring probable cause and investigative stops requiring reasonable suspicion.[87] Investigative stops captured under the Fourth Amendment are known as "*Terry* stops"[88] and are the functional equivalent to investigative detentions under s. 9 of the *Charter*. They require a "particularized and objective basis for suspecting the particular person stopped of criminal activity."[89]

The facts giving rise to *Curry* occurred one evening in 2017. Four officers were patrolling an area in Richmond, Virginia, when they heard five to six gunshots coming from nearby.[90] They quickly drove towards Walcott Place, arriving only 35 seconds later. Their presence in the area and corresponding quick response time were due in part to the Richmond Police Department's use of predictive policing algorithms.[91] Following six shootings and two homicides in the previous three months, the area was flagged as a "hot spot."[92] Upon arrival, the officers received dispatch calls that gunfire was reported at Walcott Place. They did not receive a suspect description. There was an open field flanking the building, with a handful of men walking away from the building and several people standing near the apartment building. The officers fanned out across the field, walking towards individuals and shining their flashlight on their waistbands and hands, looking for weapons.

One officer (Gaines) approached Curry and instructed him to put his hands up, to which he complied. Gaines then instructed Curry to pull up

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85 965 F (3d) 313 (4th Cir 2020) [*Curry*].

86 US Const amend IV (the United States does not have an equivalent of s. 9).

87 James Stribopoulos, "The Forgotten Right: Section 9 of the Charter, Its Purpose and Meaning" (2008) 40 SCLR (2d) 211 at 211, n 5.

88 *Terry v Ohio*, 392 US 1 (1968).

89 *United States v Griffin*, 589 F (3d) 148, 152 (4th Cir 2009).

90 *Curry*, *supra* note 86 at 5.

91 *Ibid* at 65, Wilkinson J. dissenting.

92 *Ibid*. See also *United States v Curry*, 937 F (3d) 363 at 367 (4th Cir 2019).

his shirt, which he did, but Gaines testified that he could not see the entire waistband and then Curry turned away. Gaines called for back-up to do a pat-down search of Curry. A revolver was found on his person, and Curry was arrested for possession of a firearm by a convicted felon.

The district court found that Curry's seizure was not a lawful *Terry* stop as Gaines lacked particularized reasonable suspicion. It also rejected the government's argument that Curry's seizure was justified under the exigent circumstances exception to the Fourth Amendment.[93] The government appealed, conceding that there was no reasonable suspicion for the seizure and instead justifying the seizure on exigent circumstances alone. A split panel of the Fourth Circuit reversed the district court's ruling. Curry then successfully petitioned for a full panel rehearing en banc.

The court upheld the district court's decision, affirming that exigent circumstances did not justify the suspicion-less seizure of Curry.[94] Officer Gaines testified that he told Curry to stop and show his hands because "the high crime area, the recent violent incidents, and the shots he had heard"[95] led him to conduct seizures of not only Curry but also the other men in the field. Although he cited generalized suspicion and safety concerns, the court determined that without more specific facts particularizing Curry as having engaged in criminal activity, this did not meet the threshold of reasonable suspicion for a *Terry* stop.[96]

Additionally, the majority found that the situation the officers faced did not rise to the level of exigent circumstances. The situations in the jurisprudence where suspicion-less, investigatory seizures were conducted pursuant to exigent circumstances all had clear, limiting principles[97] and at least some level of particularized suspicion relating to the safety threat.[98] Although the government emphasized the fact that the area had been plagued with shootings in the preceding weeks, the majority refused to give that fact "special weight"[99] in their analysis. They asserted that to do so would essentially relegate residents of high-crime areas to a lower level of

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93 *Curry*, *supra* note 86 at 8–9 (the district court granted Curry's motion to suppress the evidence of the revolver as well as statements he made while in custody).

94 *Ibid* at 4.

95 *United States v Curry*, No 3:17-cr-130, 2018 WL 1384298 at 20 (ED Va 2018).

96 *Ibid* at 27.

97 *Curry*, *supra* note 86 at 19.

98 *Ibid* at 23, n 8.

99 *Ibid* at 32.

Fourth Amendment protection, which risks treating them as "second-class citizens."[100]

This holding fits with the Supreme Court of Canada's reasonable suspicion jurisprudence: some level of individualization is required. The only suspicious act that officers testified Curry engaged in was walking away from officers after raising his hands for the first time. The Supreme Court has said that officers cannot rely upon behaviours that arise from the exercising of *Charter* rights (for example, walking away from questioning if they are not lawfully detained) to show suspicion.[101] Thus, Curry's walking away from the officer after complying with his initial request would likely fall into the category of normal behaviour if this case was before a Canadian court.

An examination of the dissent reveals a more complicated picture. Judge Wilkinson argued that the use of predictive policing technologies (which allowed officers to respond in 35 seconds) rests on a trade-off: police will get to the scene faster, but with less information. Thus, to expect them to wait around for more information to be discovered before taking action is to deliver "a gut-punch to predictive policing."[102] Wilkinson and the remaining dissenting judges took the position that not only did the unfolding active-shooter scenario qualify as an exigent circumstance, but that Gaines acted reasonably in response to it.[103] Therefore, since the Fourth Amendment rests on reasonableness, the analysis should not require particularized suspicion such as *Terry*, but merely that the State's response to the threat was reasonable in the context of the exigent circumstances.

Canadian law also recognizes that constitutional rights may be circumscribed where exigent circumstances exist. At common law, warrantless searches are permitted in some cases where exigency leads an officer to believe that either evidence is likely to be lost if there is a delay due to gaining a warrant, or where there is a safety threat that calls for immediate action.[104] The Supreme Court has also recognized a general safety search power under the ancillary powers doctrine which allows officers to conduct a frisk search for weapons where they have reasonable

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100 *Ibid*, citing *Utah v Strieff*, 136 S Ct 2056, 2069, 195 L Ed 2d 400 (2016), Sotomayor J. dissenting.

101 *Chehil*, *supra* note 60 at para 44.

102 *Curry*, *supra* note 86 at 71, Wilkinson J., dissenting.

103 *Ibid* at 73.

104 *Hunter et al v Southam Inc*, [1984] 2 SCR 145, [1984] SCJ No 36; *Grant*, *supra* note 67.

grounds to believe that a person is armed and dangerous.[105] Exigent circumstances related to search powers have also been codified. For example, s. 117.02(1) of the *Criminal Code* allows an officer to search a person where they have reasonable grounds to believe that a firearms-related offence has been committed and that evidence is likely to be found on the person.[106]

There is no police power to conduct a suspicion-less search (and, by extension, detention) of an individual. However, the Supreme Court has also used the ancillary powers doctrine to allow for investigative roadblock stops where there is generalized probable grounds. In *R v Clayton*,[107] officers responded to a call describing four individuals who were brandishing guns outside of a strip club.[108] Within minutes they blocked the parking lot exit and stopped a car attempting to leave, even though it was not one of the vehicles that was described to them. The Supreme Court upheld the detention given that the response was logistically tailored to a specific geography and within a short timeframe of a serious offence being reported.[109] Thus, although the officers lacked individualized suspicion as to the vehicle that they stopped, the generalized probable grounds combined with the tailored nature of the *Charter* infringement was justified.

The reasoning in *Clayton* is quite similar to Wilkinson's "trade-off." When officers are responding quickly to a serious offence (of which firearm-related incidents will almost certainly always fall under), there may be a lack of specific information for them to act on. Yet as long as their response is temporally and geographically tailored to the threat being faced, individualized suspicion may not be required depending on the context. In *Clayton*, the response targeted vehicles leaving the parking lot five minutes after an incident was reported. In *Curry,* the response targeted some of the men leaving the surrounding area of an apartment complex where shots were heard seconds earlier. *Curry* can be distinguished in that the officers had less information about the incident than those in *Clayton*, however, not by much.

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105 *R v MacDonald*, 2014 SCC 3 at para 44; *Mann*, *supra* note 70.

106 RSC 1985, c C-46.

107 2007 SCC 32 [*Clayton*].

108 Steven Penney, Vincenzo Rondinelli & James Stribopoulos, *Criminal Procedure in Canada*, 2nd ed (Toronto: LexisNexis Canada, 2018) at 128.

109 *Clayton*, *supra* note 110 at para 41.

Given that Canadian law already recognizes "trade-offs" in the case of roadblock stops lacking individualized suspicion, *Curry* presents a scenario that will become more common if predictive policing is effective at getting officers to the scene faster. Whether the individualized suspicion requirement will fall by the wayside when officer response is quick and tailored remains to be seen, however, there are important policy reasons against this as stated strongly by the majority in *Curry*.

If officers no longer need to provide individualized suspicion for detentions, *Charter* rights will be diminished. The rights of those who happen to live in areas with a greater police presence—or "hot spot" areas—will be further diminished. Courts should vigorously guard against this so that certain individuals are not treated as "second-class citizens" based on where they live.

C. The Path Forward

The decision in *Curry* highlights the myriad ways that predictive police technologies might be treated by courts in Canada. For a seemingly commonplace interaction between an officer and individual, the decision spanned ninety-nine pages with four separate concurring decisions and two dissents.[110] Thus, it is clear that reasonable people can disagree about how

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[110] *Curry*, *supra* note 86. The majority opinion authored by Judge Floyd held that in order for a suspicionless seizure to be justified under exigent circumstances, it must be narrowly targeted based on a known crime and controlled geographic area. Chief Judge Gregory concurred, emphasizing that actions taken with the intent of preventing crime do not automatically make them constitutional. Judge Wynn concurred, warning against sociological studies and policy considerations becoming determinative of constitutional questions. Judge Diaz (joined by Judge Harris) concurred, dealing with the government's argument that Curry's seizure was lawful under the "special needs" doctrine, which eliminates the requirement for individualized suspicion altogether in certain circumstances (such as roadblock stops). He found that this argument was not supported on the facts of *Curry*, given that the officers were not discretionless and systematic in how they chose to search individuals after the gunfire was heard. Judge Thacker (joined by Judge Keenan) concurred with a strong critique of predictive policing, describing it as "little more than racial profiling writ large." Judge Richardson (joined by the five other dissenting judges) wrote a dissenting opinion that emphasized the contextual factor of recent gun violence in the community as weighing in favor of the reasonableness of Officer Gaines's actions. He argues that to limit suspicionless searches to situations where there is a known crime and controlled area is to straightjacket police from responding to crime. Judge Wilkinson wrote a separate dissent, advocating for police to be able to use whatever reasonable strategies work for their community—including predictive technologies.

to incorporate this new policing technology into reasonable suspicion determinations. A few of the potential directions are discussed below.

1. Limit the Weight of the Factor

The majority in *Curry* excluded the "high-crime" area determination from the reasonable suspicion analysis altogether. This is consistent with what academics suggest.[111] Although police may use predictive technologies to help decide where officers should be deployed, it should not be used as a factor to be relied upon in the reasonable suspicion analysis.

This approach would relieve decision-makers from having to wrestle with the logic, assumptions, and theory of big data predictive analysis. As discussed in section 2A of this paper, predictive technologies are limited in their ability to separate causation from correlation. This limitation, combined with the fact that most of the software used is proprietary[112] and either unknowable or inscrutable to the public, makes these algorithms a 'black box.'[113] This lack of transparency makes it nearly impossible to justify legal decisions based on machine learning where its assumptions, variables, and weighing of each are unable to be examined.[114]

Yet despite the benefits of this approach, courts might not adopt it given that the reasonable suspicion test considers the "totality of the circumstances." This includes information that police had at the time. Whether they knew crime was forecasted to occur at the place where they noticed an individual engaging in suspicious activity may be found to be relevant in the s. 9 analysis.

2. Additional Onus on the Crown

Another direction advocated by some scholars is to place a burden of proof on the Crown to show that stereotypes did not play a role in officer's exercise of discretion.[115] This resembles challenge-for-cause jury selection, where racism rebuts the presumption that all jurors are unbiased. This approach also recognizes there will always be an information asymmetry

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111 See e.g. Fabio Arcila Jr., "Nuance, Technology, and the Fourth Amendment: A Response to Predictive Policing and Reasonable Suspicion" (2014) 63 Emory LJ 87 at 88.

112 Robertson, Khoo & Song, *supra* note 5 at 130–31.

113 Chan & Moses, *supra* note 24 at 34.

114 Robertson, *supra* note 5 at 35.

115 David M. Tanovich, *The Colour of Justice: Policing Race in Canada* (Toronto: Irwin Law, 2006) at 145.

where the state is in a better position to show the reasons for the stop,[116] and that individuals are generally hard-pressed to prove discrimination due to the privatized and generally opaque nature of the technology.[117]

Although this onus might result in algorithmic bias being brought to light and examined sooner, it may be prejudicial to require the Crown to adduce additional evidence and potentially experts for every s. 9 hearing. In terms of the individualization component, courts have made it clear that the Crown already bears an onus of showing how the objective facts must be "tied to the individual."[118]

A statutory duty similar to the one found in *Ewert*[119] could help to ensure that the algorithms relied upon by police are effective and non-discriminatory. However, this might result in a patchwork of standards across the country given that provinces, not Parliament, have jurisdiction over their provincial police forces.[120] Thus, a rigorous analysis of the factors relied upon by the officer may be a better option, as explained below.

3. Quantify the Weight of the Factor

Some level of quantification by courts as to what falls within the range of reasonable suspicion might aid in ensuring that predictive area-based algorithms used by police do not erode s. 9 protections. Steven Penney argues that certainty in decision-making could be increased if courts would define standards such as "reasonable suspicion" to fall within a range of accepted statistical possibilities.[121] For example, if the reasonable suspicion is defined to fall somewhere between 11 and 35% probability of criminality,[122] then *Chehil* might have had a different outcome had it been deduced that their drug-courier profile only had a 2% success rate in identifying drug traffickers.[123]

Although courts are generally deferential to officer testimony and experience when it comes to accepting "high-crime area" as a factor in the constellation, courts have applied evaluative approaches to bare assertions

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116 *Ibid* at 147.

117 Robertson, Khoo & Song, *supra* note 5 at 122.

118 *Chehil*, *supra* note 60 at para 46.

119 *Ewert* SCC, *supra* note 47.

120 *Constitution Act, 1867* (UK), 30 & 31 Vict, c 3, s 92(14), reprinted in RSC 1985, Appendix II, No 5.

121 Steven Penney, "Standards of Suspicion" (2017) 65 Crim LQ 23 at 48.

122 *Ibid*.

123 *Ibid* (borrowing from the analysis on page 52).

before. When an officer cited being in a high-crime area as a reason for arrest in *R v Brown*, the Ontario Court of Appeal determined that "[t]he evidence supporting that contention was thin to say the least."[124]

Given the sophistication of the technology being utilized by police departments, embracing a level of "analytical rigor to the high-crime area question" may be the path forward.[125] Andrew Guthrie Ferguson argues for a "particularized approach" to replace "high-crime area" assertions and their analysis. This would require officers who are relying on predictive data to show a nexus between the particular crime being forecast and the observed individualized activity.[126] This approach could help guard against the issue of over-policing in two ways.

First, if an officer was deployed to patrol an area for a certain type of crime (break and enters) and instead comes across suspicious behaviour associated with another type of crime (drug dealing), they may not be able to use that forecast to bolster their reasonable suspicion justification as to why they detained an individual for a drug dealing investigation.[127] Second, if officers are able to reference that the possibility of a break and enter in that area was forecast at a 31% likelihood that day, that contextual factor can be given appropriate weight. A forecast of only 2% might fail to weigh in favour of a reasonable suspicion.[128]

Whether on its own or combined with a court's quantitative range of reasonable suspicion as described above, these specific factors can allow for the "independent and rigorous judicial scrutiny"[129] of reasonable suspicion called for in the case law. As Ferguson notes in his scholarship: "Hard data has a way of hardening previously fuzzy judgment calls."[130]

IV. CONCLUSION

Predictive policing technologies have arrived in Canada, as have the multiple concerns that come with relying on machine learning to inform human decision-makers. There has been considerable debate around area-

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124 *R v Brown*, 2012 ONCA 225 at para 18.

125 Ferguson, "Crime Mapping", *supra* note 1 at 221.

126 *Ibid*.

127 Andrew Guthrie Ferguson, "Predictive Policing and Reasonable Suspicion" (2012) 62:2 Emory LJ 259 at 321–22 [Ferguson, "Predictive Policing"].

128 *Ibid* at 322.

129 *Chehil*, *supra* note 60 at para 3.

130 Ferguson, "Predictive Policing", *supra* note 130 at 322.

based predictive policing forecasts, which have the potential to exacerbate over-policing and undermine *Charter* rights. However, given the Supreme Court's commitment to an individualized reasonable suspicion standard, it is unlikely that s. 9 rights will be eroded by the use of area-based predictive technologies. The use of algorithms may necessitate a move towards quantifying the reasonable suspicion standard as part of the court's rigorous scrutiny. Whether these emerging technologies find purchase in the law under this scrutiny remains to be seen.