Does PredPol Dream of Objectivity?

A Critical Discourse Analysis of Objectivity in Predictive Policing

Promotional Materials

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Teddy Zamborsky

Supervisor: Professor Brian Balmer

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Abstract

Predictive policing is a rapidly growing method that uses data, mathematics, and algorithms to organize and justify policing. A key term in the marketing, public debate, and scholarship about these technologies is *objectivity*. Informed by existing scholarship about predictive policing technologies and objectivity, this project seeks to investigate how PredPol, the maker of a particular predictive policing technology, constructed and invoked the objectivity of their[1] technology. To do this, I conduct a critical discourse analysis of PredPol's website, closely reading 20 documents to understand how PredPol created and used the term objectivity. I then examine how PredPol's construction of objectivity fits into an existing theoretical taxonomy of objectivity. I argue that PredPol constructed a form of objectivity that included elements of both mechanical objectivity and trained judgment, using this construction to market their technology to customers and to answer critics. My analysis also suggests that the focus of certain theories about predictive policing should be expanded beyond objectivity to include *transparency*.

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[1] Throughout this project, I refer to PredPol using *they* as a pronoun, as opposed to *it*, to deliberately emphasise that PredPol, and their technology, are created by a group of people.

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Introduction

Since the late 2000s, predictive policing technologies have been adopted by police

departments, with the Electronic Frontier Foundation (EFF) (no date) documenting 197

different law enforcement agencies using them in the United States alone through 2024.

PredPol, later renamed Geolitica[2] before selling their technology to policing technology

company SoundThinking in 2023, was one of the first predictive policing technology

companies (Mehrotra and Cameron, 2023). PredPol's technology might also be the most

widely used predictive policing technology, although this is difficult to assess as the usage of

their technology is not always publicly known (Mehrotra and Cameron, 2023). Predictive

policing technologies come in different forms, but they are united by the goal of predicting

future crimes using data, mathematics, and algorithms and providing those predictions to law

enforcement, who can then attempt to prevent those crimes (Lau, 2020).

Predictive policing technologies have been controversial since they became publicly

known. Proponents have argued that predictive policing technologies can help to prevent

crime and provide a less biased alternative to current practices of policing (Norga, 2021).

Proponents have also focused on how the use of algorithms can provide objective insight into

crime patterns in different neighbourhoods (Norga, 2021). Critics, however, have called the

technology discriminatory, arguing that the technology perpetuates racial profiling in policing

(Norga, 2021). Critics have also questioned the accuracy of the technology at predicting

crimes and noted privacy and civil liberty concerns (Norga, 2021). These criticisms are not

abstract. In 2013, for instance, Robert McDaniels, a Black man living in Chicago, was

informed by the Chicago Police Department (CPD) that, based on a computer algorithm, he

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[2] Throughout this project, I will refer to the company as PredPol, as that was the name of the company for most
of its life.

was likely to either shoot someone or be shot by someone in the future (Stroud, 2021). As a result, McDaniels was subject to increased surveillance from the CPD, which left him alienated from his community (Stroud, 2021). Ultimately, he was shot, twice, because, in his view, people in his neighbourhood believed him to be a "snitch" to the CPD due to his frequent contact with them (Stroud, 2021). McDaniels believed that this algorithm is what led to his two shootings (Stroud, 2021). The algorithm in question was the Strategic Subject List, a predictive policing technology used at the time by the Chicago Police Department (Stroud, 2021). Similarly, PredPol has been criticized for directing police to disproportionately target Black and Latino communities in the United States (Angwin, 2021).

As mentioned earlier, predictive policing technologies are often justified because they bring *objectivity* to policing (Ahmed, 2018; Ferguson, 2017; Gilbertson, 2020). As I will show later, the claim that predictive policing technologies are objective has received attention from scholars in science and technology studies (STS) and allied fields, as has the concept of objectivity more generally. My project intends to add to this body of knowledge by examining a specific predictive policing technology, the technology produced and sold by PredPol, which I refer to as *PredPol's predictive policing technology*. Inspired by the focus on objectivity among proponents and critics of the technology, I plan to study PredPol's predictive policing technology through the lens of objectivity. This project will not, however, directly study whether PredPol's predictive policing technology is objective. This project does not attempt to establish a definition of objectivity and assess whether PredPol's predictive policing technology can meet that definition but rather focuses on how PredPol constructed and invoked the notion of objectivity in materials promoting their technology. By *constructed*, I refer to exploring how PredPol defined objectivity and how PredPol argued their technology is objective. By *invoked the notion of objectivity*, I refer to exploring how PredPol used their claim of objectivity to argue for the adoption of their technology. I will

also consider two subsidiary research questions. The first will focus on analysing how PredPol's construction of objectivity compares to Daston and Galison's (2010) taxonomy of objectivity and assessing whether it is captured by any of Daston and Galison's epistemic virtues. Secondly, I will investigate whether there are any other concepts that are frequently invoked in the text alongside objectivity. The purpose of this question is not to explore these other concepts in depth, as I will be unable to due to the constraints of this project. Rather, this question functions to produce material for future study and to question whether objectivity is as important to this material as I, and other scholars I will discuss, seem to think. To answer these questions, I will conduct a critical discourse analysis (CDA) on PredPol's promotional materials.

Before continuing further, it is worth discussing my perspective going into this project. I entered this project as a critic of predictive policing technologies, PredPol, and policing more generally, and exited with those convictions strengthened. Though I believe fully excluding my perspective is neither possible nor desirable, by reflexively reminding myself of my position throughout the project, I strove to ground my analysis in the text itself and avoid reading my existing perspective into the analysis.

This project will be structured as follows. It will start with more background on predictive policing and continue with a literature review that explores existing literature in STS and allied fields about predictive policing technology and objectivity as well as a few other concepts used in the analysis. It will then proceed with a discussion of methods and methodology, specifying the details of the CDA. It will follow with a results section, where I answer my core research question and subsidiary questions. In the results section, I will show how PredPol constructed objectivity through a variety of linguistic techniques, especially the use of a structural opposition between humans and algorithms. I will then show that PredPol invoked objectivity as a sales pitch to customers and as a response to critics. This project

will end with a discussion of the implications of the answers to my research questions on existing literature, of the limitations of this study, and of the opportunities for further research.

Predictive policing refers to the use of "computer systems to analyze large sets of data, including historical crime data, to help decide where to deploy police or to identify individuals who are purportedly more likely to commit or be a victim of a crime" (Lau 2020). PredPol's predictive policing technology is location based, as it uses the date, time, and location of past crimes to predict where and when future crimes may occur (Sankin et al., 2021). The predictions are represented as 500-by-500-foot boxes displayed on a map that mark where PredPol's predictive policing technologies determine a crime is most like to occur (Sankin et al., 2021). A map produced by PredPol's predictive policing technology is displayed in Figure 1 below. It is drawn from a presentation titled "PredPol is not a Black Box"[3] that was given by PredPol founder P. Jeffrey Brantingham (no date).
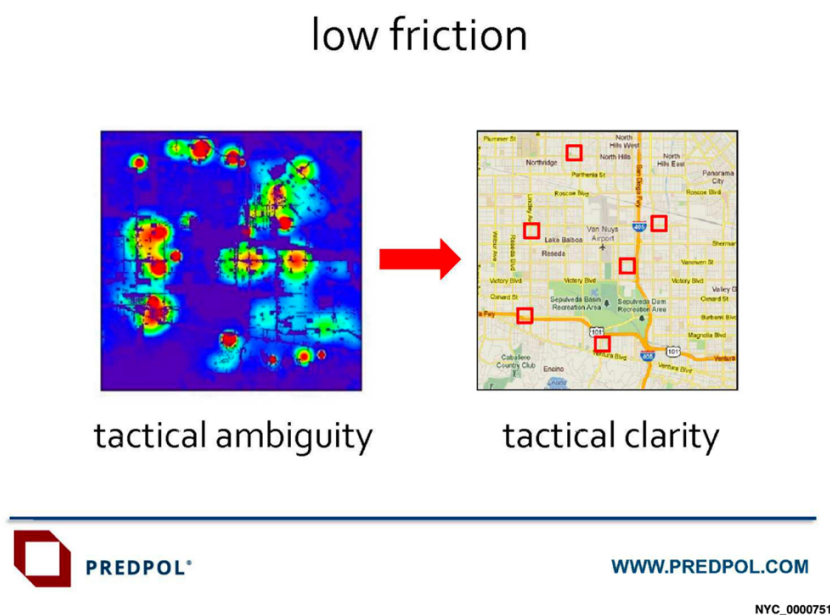

Figure 1: A slide from PredPol's presentation "PredPol is not a Black Box". On the left is a heatmap of crime, while the map on the right shows the red boxes that PredPol uses to represent their predictions of where crimes will occur (Brantingham, no date).

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[3] This presentation was considered as a document for this discourse analysis but was not included for reasons described later.

My literature search[4] revealed a nascent body of scholarship about predictive policing from STS and allied fields such as critical security studies, queer theory, critical race theory, criminology, and others. This literature review will focus on existing scholarship from STS and allied fields on predictive policing, much of which has focused on sociotechnical imaginaries or objectivity. It will then discuss Daston and Galison's work on objectivity, which will strongly inform the critical discourse analysis. Finally, it will discuss work on the use of scientific and mathematical language to achieve legitimacy.

Sociotechnical Imaginaries of Predictive Policing

Much of the existing literature has invoked, explicitly or implicitly, the STS concept of "sociotechnical imaginaries" (Chan, 2021, p. 50; Lazaro and Rizzi, 2023, pp. 70–71; McInerney, 2023, pp. 102–103; Sanders and Chan, 2023, p. 776; Scannell, 2019, p. 115; Stimmel, 2020). Sociotechnical imaginaries are "collectively held, institutionally stabilized, and publicly performed visions of desirable futures, animated by shared under-standings of forms of social life and social order attainable through, and supportive of, advances in science and technology" (Jasanoff, 2015, p. 4). Imaginaries do not merely describe possible futures, but "prescribe futures that states believe ought to be attained" (Jasanoff and Kim, 2009, p. 120).

Though sociotechnical imaginaries of predictive policing described by each author are significantly different, several touch on the key concept of objectivity. Stimmel (2020, 32)

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[4] The literature search involved using Google Scholar, initially with the following search terms: "predictive policing", "predictive policing sts", and "predictive policing science and technology studies". After reviewing the initial results, the follow terms were also searched: "predictive policing queer theory", "predictive policing security studies", "predictive policing feminism", and "predictive policing critical race theory". In addition to Google Scholar queries, reference lists from sources found in the above process were then used to find additional sources.

has studied sociotechnical imaginaries of predictive policing and identified claims that predictive policing will provide police reform through objectivity. Chan (2021, p. 49-50) has documented four different sociotechnical imaginaries about predictive policing technologies: a "utopian" imaginary held by police officials that emphasises efficiency gains and crime reductions from predictive policing technology as well as its status as "fact-based" and three other imaginaries that resist this utopian imaginary. One "resistant" imaginary is the "social scientist" imaginary that focuses on "assumptions, evaluation and accountability issues" involved in predictive policing (Chan, 2021, pp. 50–51). Another is the "data scientist" imaginary that focuses on ways that machine learning methods can introduce discrimination, such as models reproducing bias present in the data used to train it, improper model design that assumes unjustified correlations, or failures in the process of evaluating models (Chan, 2021, pp. 52–53). The last is the "civil rights community" imaginary, which focuses on the impact of predictive policing technologies on the communities it claims to protect (Chan, 2021, pp. 53–54). Though not explicitly written in the language of sociotechnical imaginaries, Scannell (2019, p. 115) notes how predictive policing expands "datafied imaginaries of a morphing carceral state" with the belief that it can render policing "truly objective." This focus on objectivity suggests it is a key term to investigate when studying predictive policing technologies.

Other authors focus on different characteristics in their descriptions of imaginaries. Lazaro and Rizzi (2023, 70-71, 81) have treated predictive policing as part of an emerging sociotechnical imaginary where predictive analytics "shapes a programmatic way of formalizing, justifying and deploying action in the here and now." McInerney (2023, pp. 102–103) has argued that police departments and companies selling predictive policing technologies have created a sociotechnical imaginary around predictive policing technologies and gender-based violence. This imaginary can be understood by analysing how predictive

policing technologies are thought of in "public discourse" (McInerney, 2023, p. 102). The variety among these descriptions of sociotechnical imaginaries for predictive policing suggests the need for further study. Additionally, though discourse analysis has been suggested as a potentially useful method for understanding imaginaries of predictive policing (Sanders and Chan, 2023, p. 777), there is not a body of discourse analyses that interrogates the underlying ideologies present in the promotional material for predictive policing. This project will fill that gap.

Objectivity in Predictive Policing

Even outside the work on sociotechnical imaginaries, objectivity is a key theme in studies of predictive policing. Egbert and Mann (2021, p. 39) have noted that objectivity is often touted as a benefit of predictive policing but have argued that these technologies are neither objective nor neutral and, in fact, have "discriminatory potential in [their] rationalities, design, and applications." They have argued that STS analysis is an especially fruitful avenue for investigating predictive policing (Egbert and Mann, 2021, pp. 39–40). Sandhu and Fussey (2021, p. 68) connect predictive policing technologies with the broader "empirical turn in police work so that police decisions are based in technologically enhanced, and therefore objective, analytics rather than human subjectivity and bias." Their work has noted how, despite the claims of technological objectivity, these technologies do not "neutralise the subjectivity of police work" (Sandhu and Fussey, 2021, p. 66). Waardenburg, Sergeeva, and Huysman (2018, p. 96-97) conducted an ethnographic study focused on the emergence of the "intelligence officer" at police departments, who "support police officers in the use of predictive policing technology, by helping them to make sense of algorithmic outputs." They ultimately concluded that these new officers, despite the human subjectivity that their role as an intermediary included, resulted in reinforcing "police officers' belief in

the superiority of algorithmic decisions over human expertise" (Waardenburg, Sergeeva and Huysman, 2018, p. 97). They also noted the supposed benefit of these technologies as making work "effective, efficient, and objective" (Waardenburg, Sergeeva and Huysman, 2018, p. 96). Taken together, these point to objectivity as a key term in the discourse on predictive policing technologies and, as such, one in need of further study.

<p style="text-align:center">Theorising Objectivity: Daston and Galison</p>

STS has long problematized objectivity. Latour and Woolgar (2013, p. 180), based on ethnographic observation, have argued that objectivity in science is socially constructed. Practices often held to be objective, such as mathematics generally (Nelson, 2015, pp. 3–4) or counting more specifically (Martin and Lynch, 2009, p. 243), have been shown to be intimately social. Furthermore, Daston and Galison (1992, pp. 81–82) have noted how the specific meaning of "objectivity" is historically situated.

Objectivity as discussed by Daston and Galison is worth examining in depth, as their framing will be used significantly in later chapters. They discuss objectivity as an example of one of the many epistemic virtues of science, which they define as "norms that are internalized and enforced by appeal to ethical values as well as to pragmatic efficacy in securing knowledge" (Daston and Galison, 2010, pp. 40-41). New epistemic virtues can be developed over time, while existing virtues often evolve or change in response to new epistemic virtues (Daston and Galison, 2010, p. 41). They trace objectivity among the competing epistemic virtues of "truth-to-nature" and "trained judgment" (Daston and Galison, 2010, p. 18). The virtue of "truth-to-nature" guided naturalists in the eighteenth and nineteenth centuries to produce "reasoned images" of specimens that were "characteristic exemplar[s]" of species under examination (Daston and Galison, 2010, p. 42). These characteristic exemplars "smoothed out anomalies and variations", including intervening to

"'correct' nature's imperfections" (Daston and Galison, 2010, p. 42). Objectivity developed as a response to concerns about "truth-to-nature" (Daston and Galison, 2010, pp. 42-43). They define objectivity as "blind sight, seeing without inference, interpretation, or intelligence" (Daston and Galison, 2010, p. 17) and say that to be objective is to "aspire to knowledge that bears no trace of the knower – knowledge unmarked by prejudice or skill, fantasy or judgment, wishing or striving" (2010, p. 17). They describe a version of objectivity known as "mechanical objectivity", where scientists strive to create images as if those images were made by automatons, with the images "untouched by human hands" (Daston and Galison, 2010, pp. 42–43). Mechanical objectivity attempted to prevent the scientist from projecting "perfections and expectations onto the data", with anomalies preserved rather than smoothed out (Daston and Galison, 2010, p. 45).

Structural objectivity was another form of objectivity, developed as a response to mechanical objectivity, that sought to remove images entirely from science, excluding "mathematical intuition" as well (Daston and Galison, 2010, p. 45). In response to concerns about the variable, individual nature of sense perception, advocates of structural objectivity argued for a science that preferenced structures, such as differential equations and logic, that they claimed were "invariant across culture and history" (Daston and Galison, 2010, p. 45). Structural objectivity presupposed a "realm of pure thought" that is invariant with respect to the individual thinking being (Daston and Galison, 2010, p. 259). Objectivity was not to be found in uninterpreted facts, intuitions, or perceptions, but in "structural relationships" that persisted regardless of different cultures, psychologies, or paradigms (Daston and Galison, 2010, p. 259). Structural objectivity was not the only response to mechanical objectivity, however, as others responded with "trained judgment" as an epistemic virtue (Daston and Galison, 2010, p. 45). Advocates of trained judgment claimed that mechanical objectivity was too particular and argued that scientific experts could rely on expertise and intuition to

help distinguish between scientific images more accurately than mechanical algorithms could (Daston and Galison, 2010, p. 46). Trained judgment allowed for the subjective influence of trained scientists to modify or interpret the output of a mechanically objective process (Daston and Galison, 2010, p. 21). As such, trained judgment is not a return to truth-to-nature but builds on mechanical objectivity. These different virtues do not perfectly supersede each other but exist together, ebbing and flowing in their importance (Daston and Galison, 2010, p. 18).

There has been little work applying Daston and Galison's framing of objectivity to predictive policing. Galison (2019, p. 139). has connected mechanical objectivity with contemporary trends in algorithmic modelling, noting among modern "algorists" a "tremendous desire" to find mechanical objectivity in their work. This work spoke of algorists more generally but could apply to PredPol and predictive policing more broadly. Dasha Pruss (2023, pp. 3–4) has analysed how mechanical objectivity typically ascribed to algorithms has been positioned as a beneficial feature of risk scores for criminal sentencing. Pruss has also expanded Daston and Galison's framing to include "meta-mechanical objectivity", which attempts to "minimize algorithmic bias rather than human bias" (2023, p. 24). Marciniak (2021, 3) has discussed mechanical objectivity as a "resource of power and trust" for criminal justice technologies, including predictive policing. This project will expand on this work to fill this gap in the literature by using Daston and Galison's framing as a jumping-off point to examine how PredPol constructs and invokes its notion of objectivity.

Scientific and Mathematical Language

As will be shown later, PredPol invokes mathematical and scientific language frequently in marketing materials for its technology. Advertising discourse scholar Helen

Ringrow (2014, p. 195) has written about the use of scientific language in cosmetic advertising to legitimise their product, noting that scientific language has been used whether or not a potential customer can understand the purported science involved in the particular cosmetic (2014, p. 196). Similarly, mathematician Neal Koblitz (1981, pp. 111–112) has written about the usage of mathematics as a form of propaganda, noting how equations can be used to produce "mystification, intimidation, [and] an impression of precision and profundity." It does not appear as if these perspectives have been applied to predictive policing before. The critical discourse analysis will read PredPol's marketing materials that use scientific and mathematical language and analyse whether PredPol's usage of mathematical or scientific language is used to legitimise their technology, as Ringrow describes, or as a form of propaganda, as Koblitz discusses.

This project will build on the foundations of the work on sociotechnical imaginaries of predictive policing and the work on objectivity with respect to predictive policing technologies. It will explore how objectivity was constructed and invoked by PredPol in marketing and promotional materials about its eponymous predictive policing technology. This can serve as a case study for scholars to use in clarifying the specifics of sociotechnical imaginaries of predictive policing. It also builds on existing scholarship by employing discourse analysis, which has been suggested as a method for exploring predictive policing technologies but has been underutilised.

Methods and Methodology

Document Search

This project's analysis is focused on PredPol's website, "predpol.com." I chose to focus on PredPol's website because it was intended for public view, and my project is interested in how objectivity was constructed and invoked by PredPol to the public. PredPol's website is no longer publicly available, so an archived copy of it was used. Wayback Machine, the digital archive maintained by Internet Archive, has a sitemap of the website "predpol.com". Using that sitemap and the API provided by Wayback Machine, I was able to identify 366 different pages as part of the website "predpol.com", with a total of 15948 distinct timestamps corresponding to occasions when pages were archived, not necessarily times the page content was changed. Similarly, the subdomain "blog.predpol.com", which was launched circa 2017 to host their blogs, contains another 4408 distinct timestamps across 274 distinct pages. This is far too many to inspect manually, and many are not substantive pages, so some simplifying assumptions were made. The site "predpol.com" includes a blog section, where PredPol employees wrote about their technology or highlighted success stories. Using the sitemap, Wayback Machine API, and the Python libraries "requests" and "BeautifulSoup", I was able to extract the blogs as HTML documents. Since any given blog was archived multiple times by the Wayback Machine, I chose the earliest archived copy of each blog, as that represented the text of the blog closest to its original publication. This resulted in 152 distinct blog posts between the domains "predpol.com" and "blog.predpol.com."

Aside from blog posts, I manually analysed the sitemap of "predpol.com" to attempt to find other pages to use as documents for analysis. I looked for pages where PredPol explained how their technology functioned, such as describing the algorithms or mathematics

behind it. This approach was motivated by the connection between mechanical objectivity and algorithms as well as the connection between structural objectivity and mathematics noted in the literature review. I found two pages that describe the technology underlying PredPol's predictive policing technology: the page "How Predictive Policing Works", with copies archived from 2014 to 2020, and the page "Predictive Policing Technology", with copies archived from 2012 to 2023. For each year these two pages were archived, I added the copy with the earliest timestamp to the initial document collection. Additionally, manually reviewing these pages revealed the existence of a white paper on "The Science & Testing of Predictive Policing" that was not archived by the Wayback Machine, but I was able to find it via a Google search. This added 21 documents to the initial document collection. There are many pages on the archived PredPol website that, due to time and scope constraints of the dissertation, were left unexplored. They present potential avenues for future research.

Initially, I considered including other promotional materials produced by PredPol, such as presentations that had been given to police departments. While I was able to find these online, I ultimately chose to exclude them. There were two justifications for their exclusion, one methodological and one practical. The methodological reason is that these presentations were slideshows in format and therefore were likely accompanied by a speaker supplementing the visual materials. I was not able to locate recordings of the speaker and thus do not have a complete text to analyse. The practical reason is that, while the blog posts are predominantly written text, these presentations contain limited text and significant use of visuals. Properly applying discourse analysis to these presentations would require adding additional methods from Multimodal Critical Discourse Analysis, which would push against the practical limits of this project.

Document Filtering

The initial document search resulted in 173 potential documents for the CDA, 152 blogs along with 21 other pages. These documents were loaded into NVivo 14 for Mac, a software for qualitative data analysis (Lumivero, no date) that allowed me to search over all the collected documents. Since this project involves close, intensive analysis and interpretation of documents, including all 173 documents was impractical, and I applied additional criteria to filter down the potential documents. Four blogs were removed because the files were malformed. Then, the blogs were filtered using NVivo 14, searching for the term "objective" using the "Include stemmed words" parameter so related words, such as "objectives" or "objectivity" would be included. Consulting the website Thesaurus.com (no date), synonyms for "objective" were added to the search string. Additionally, "bias" was included because of the common dichotomy between objectivity and bias present in Sandhu and Fussey (2021, p. 68). The combined search string was "objective | objectivity | detached | disinterested | dispassionate | equitable | evenhanded | nonpartisan | open-minded | unbiased | bias", with the "|" symbol representing the logical "OR" operator, meaning a document that contained any single one of these terms was included in the search. This will be referred to as the *objectivity search string*. Using the objectivity search string in NVivo 14 reduced the potential documents to 14. I further filtered these documents with an initial reading to remove documents that 1) used the terms in the search but not with the intended meaning, such as using "objective" as a synonym to "goal", and 2) did not substantially discuss any of the terms searched. This resulted in 12 blogs being included in the analysis.

The 21 additional pages from the website that were not blogs did not include explicit references to objectivity or any synonyms. They were still included because of the previously mentioned connection between algorithms, mathematics, and objectivity. A manual review of the page "Predictive Policing Technology" revealed that, among the 12 archived copies, there

were three significantly different versions of the page. The earliest example of each was included, resulting in three documents included in the analysis. The website also contained the pages "How PredPol Works" and "How Predictive Policing Works", which contained much of the same information. Manual inspection revealed three significantly different versions of the content. The earliest example of each was included, resulting in three more documents included in the analysis. Finally, the whitepaper "The Science & Testing of Predictive Policing" was included. Thus, the total number of documents included in the analysis was 20. The documents are listed in Table 1 below, with numbers assigned for referencing during the analysis. References to specific documents will be noted in text by their number.

Document Number	Document Name	Document Type
1	5-common-myths-about-predpol	Blog
2	are-we-at-a-tipping-point-in-police-community-relations	Blog
3	are-you-holding-your-officers-accountable	Blog
4	are-your-recruiting-and-retention-strategies-working-for-you	Blog
5	caliber-is-excited-to-announce-its-partnership-with-predpol-inc	Blog
6	dr-jeff-brantingham-featured-in-ucla-article-on-predpol[5]	Blog
7	How PredPol Works ~ Predictive Policing 2014	Other Webpage
8	How PredPol Works ~ Predictive Policing 2017	Other Webpage
9	How Predictive Policing Works	Other Webpage
10	just-driving-around-isnt-a-patrol-strategy	Blog

[5] Document 6 is an article about PredPol and their founder, P. Jeff Brantingham, that was published in the UCLA Daily Bruin. It was reproduced on PredPol's website in full as a blog, which is why I treat it here as a document produced by PredPol.

11	machine-learning-and-policing	Blog
12	not-all-predictive-policing-is-created-equal-heres-why	Blog
13	Predictive Policing Technology ~ PredPol 2012	Other Webpage
14	Predictive Policing Technology ~ PredPol 2015	Other Webpage
15	Predictive Policing Technology ~ PredPol 2018	Other Webpage
16	Predictive Policing Technology ~ PredPol 2019	Other Webpage
17	predictive-analytics-beyond-policing	Blog
18	predpols-stance-on-privacy-civil-rights-transparency	Blog
19	so-you-think-you-can-build-your-own-predictive-policing-platform	Blog
20	Science & Testing of Predictive Policing	Whitepaper

Table 1: Table of documents used for the CDA.

As discussed above, PredPol was eventually rebranded to Geolitica, and their technology was later purchased by SoundThinking. For each of these, there were corresponding websites: "geotlitica.com" and "soundthinking.com." These websites were not included in this project, as analysing these other sites for potentially relevant documents would add significant time to the document-gathering step, which would detract from the time available to conduct the CDA. They present avenues for further research.

Critical Discourse Analysis

Critical Discourse Analysis (CDA) is a heterogeneous collection of research methods and theories that attempt to capture to interrelationship between "language, power and ideology" (Machin and Mayr, 2012, p. 4). This collection of methods treats language as something that "both shapes and is shaped by society" (Machin and Mayr, 2012, p. 4). CDA treats power relations as discursive and therefore able to be studied through analysing

linguistic features of texts (Machin and Mayr, 2012, pp. 4–5). CDA treats all communication as a series of semiotic choices that are subject to interrogation as to why those choices were made and what interests those choices serve (Machin and Mayr, 2012, p. 15).

The *critical* element of a CDA refers to how CDA uses the tools of discourse and linguistic analysis to reveal hidden connections between power, language, and ideology (Machin and Mayr, 2012, p. 5). This broad collection of methods is suitable for this project, as it is primarily concerned with how certain tacit assumptions concerning objectivity are constructed and deployed to justify PredPol's predictive policing technology.

Conducting the Critical Discourse Analysis

Drawing on the methods used by Clark (2023, pp. 4–5), the CDA proceeded in two stages. The first stage reviewed each of the 20 documents included in totality, specifically focusing on how these referenced objectivity or related concepts such as mathematics. Machin and Mayr (2012) note several different types of analyses that can be used in a CDA, but employing all of them would be well outside the scope of this project. During this initial reading, the analyses employed included lexical analysis, focusing on word choice, connotations, lexical absence, and structural oppositions (Machin and Mayr, 2012, pp. 30-32, 38-39). The analysis also looked for concealment strategies such as nominalisation, where verbs are replaced with nouns that "can obscure agency and responsibility" and presupposition, where statements are presented as uncontroversial and fixed that may be "contestable and ideological" (Machin and Mayr, 2012, p. 138). Finally, it examined the texts' use of metaphor and other rhetorical devices of abstraction, such as personification, objectification, and metonymy (Machin and Mayr, 2012, pp. 162, 167-171).

Each linguistic technique identified was examined for how it constructed or invoked objectivity or related concepts. These were summarized as particular constructions of

objectivity, taking inspiration from Daston and Galison's framing. The second phase of the review analysed the conceptions of objectivity present in each text and how they were deployed to justify the technology or respond to certain criticisms as well as searched for other concepts frequently invoked alongside objectivity.

The results of the analysis are organized by the research questions.

How Does PredPol Construct Objectivity?

Structural Oppositions

Despite the centrality that objectivity has in the existing literature on predictive policing, my sample of PredPol's website featured comparatively little discussion of objectivity. The blog portion of PredPol's website, which contained 152 distinct blogs collected for this project, only had 12 blogs[6] that referenced objectivity or any related words contained in the search string, and only 4 that specifically referenced "objective" or "objectivity". Despite this paucity of explicit references, PredPol constructed and invoked objectivity, explicitly and implicitly, throughout the documents sampled for this project.

PredPol's construction of objectivity proceeded from a collection of structural oppositions. Structural oppositions are "opposing concepts such as young-old, good-bad, or democracy-communism", where the individual terms acquire meaning through their use against each other (Machin and Mayr, 2012, pp. 39-40). The first is the opposition found between algorithms and humans. This opposition is found across documents 5, 6, 10, 11, 13, and 18, often rather explicitly, such as the claim that "people have cognitive biases" while "[a]lgorithms don't" in document 5 or that crime analysts "tend to skew their data" while "'PredPol removes the bias and adds a lot more data'" in document 6. PredPol used this opposition to construct its second opposition: the opposition between bias and objectivity. In

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[6] Throughout this analysis, I will reference the number of documents that contain a term or similar linguistic strategies. This is to efficiently show that something is repeated throughout documents and should not be interpreted as a claim of statistical significance.

none of the documents analysed did PredPol define bias or objectivity. Instead, PredPol presupposed them as relatively settled terms that they could invoke to describe people, processes, algorithms, or data. PredPol used the word "objective" or "objectivity" exclusively to describe nonhuman things: PredPol's "patrol management solution" in documents 1 and 10, data in documents 2 and 18, "quantitative tools" in document 3, and algorithms in document 18. At no point did they use "objective" to describe humans or a human output, such as a report done by a crime analyst. Notably, PredPol attributed objectivity only to things connected to data or mathematics, such as the previously mentioned quantitative tools, algorithms, or data itself. Importantly, though only nonhuman things had objectivity attributed to them, PredPol did allow for the possibility of algorithms not being objective, as PredPol noted the effort they put in to ensure the "data and algorithms [they] use are as objective...as possible" in document 18.

In contrast, PredPol described "bias" as predominantly, but not exclusively, a characteristic of humans. In documents 5 and 18, PredPol stated that all humans can have cognitive biases. In document 11, PredPol stated that police officers can be biased in their policing of drug or traffic offences. Data can be biased, as PredPol argued that demographic or socioeconomic data would lead to profiling of individuals if used for predictive policing in documents 1, 11, 12, 17, 18, and 20. PredPol stated in document 18 that they only used the "most accurate and objective data to which [they] have access." This leads to the third structural opposition, between what we can call *good* and *bad* data. PredPol, across documents 1, 5, 8, 10, 12, 14, 15, 16, 17, 18, and 19, repeatedly specified that their technology only used three data points to generate predictions: type of crime, location, and time. They argued in document 17 that using only this limited collection of data "eliminates any chance of inadvertent bias or profiling." It was this data specifically that, in document 18, they referred to as the "most…objective" data. We can refer to this as *good data* in this

structural opposition. PredPol held this data in opposition to *bad data*, which is demographic, economic, or personal data, the use of which they asserted would lead to profiling or bias in an algorithm and, therefore, bias in policing, as noted in documents 1, 8, 14, 15, 17, and 18.

Thus, in these documents, PredPol employed three structural oppositions to construct their notion of objectivity: algorithms against humans, objectivity against bias, and good data against bad data. Algorithms can achieve objectivity if they are given good data, but algorithms will be biased if they are given bad data, which will lead to profiling. Humans are never able to achieve objectivity.

Absolute and Relative: The Spectrum of Objectivity

PredPol implicitly treated objectivity and bias as being on a spectrum together. In document 18, PredPol emphasised that they only use "the most accurate and objective data" and that they have worked to "ensure that the data and algorithms we use are as objective and transparent as possible." The term *most* used in the first statement, and the phrase *as possible* in the second statement, imply that it is meaningful to say that one algorithm is more objective than another and, similarly, some data is less biased than other data. There was not always a modifier preceding "objective", as seen from phrases such as "objective and quantitative tools" in document 3, implying that there is both an *absolute* sense of objectivity, where a tool is objective without comparison, and a *relative* sense of objectivity, where one algorithm or data set can be seen as more objective than another.

PredPol did not construct objectivity solely through the previously described structural oppositions and explicit reference to objectivity or bias. PredPol employed three additional linguistic strategies when describing how their predictive policing works that attempt to subtly attribute objectivity to it: concealment of agency, metaphors, and connotations of mathematics. These will be discussed in the next several sections.

Objectivity and the Concealment of Agency

In PredPol's previously established conception of objectivity, humans cannot be objective and are, in fact, a potential source of bias to algorithms or data. When describing how their technology works, PredPol made linguistic choices that attempted to downplay the human involvement in their technology's operation. This section will be broken up document by document, as in each document PredPol employed a variety of methods.

In document 11, "Machine Learning and Predictive Policing", PredPol described their use of machine learning in their predictive policing technology. PredPol emphasised in the same document that machine learning does not require "explicit programming." Through this, PredPol removed the human, and therefore the potential for bias, from their technology. Notably absent from this description is the human agency involved in picking specific machine learning models to apply to the data.

Not all documents are as direct as document 11. In document 19, "So You Think You Can Build Your Own Predictive Policing Platform?", PredPol did acknowledge human involvement in creating their technology. In that document, PredPol stated that building a predictive policing technology requires "[d]etermining which data to use" and "[f]ind[ing] a model that can make accurate predictions", both of which implicitly have a human making a choice. In both cases, PredPol chose words that minimised the human choice element. PredPol framed this choice as determining "what data best predicts the likelihood of future crimes", which rendered the choice as merely a mechanistic optimisation problem. Similarly, PredPol's use of the word "find" in document 19 again frames creating a model based on the data as a mechanical optimisation problem. A person trying to *find* something has a connotation of less agency, as the person is merely finding something that already exists out

in the world. Compare this to a word such as *create* or *make* something, which emphasises the agency of the person. Again, human agency in the creation of technology is minimised.

In document 15, "Predictive Policing Technology ~ PredPol 2018", PredPol again attempted to downplay any human agency that they acknowledged. PredPol frequently employed the passive voice in this document when describing the decisions they made to build their predictive policing technology. In document 15, PredPol referred to their algorithm as "the algorithm used by PredPol." In the same document, PredPol stated that "[t]he data collected does not include any personally identifiable information (PII)." In both sentences, the passive voice hides the agency of the actor, PredPol, in decisions made in constructing their predictive policing technology: choosing the algorithm and choosing to exclude personally identifiable data. PredPol did not exclusively use the passive voice, but when they used the active voice they tended to describe processes that can be considered mechanistic and do not require human judgment, such as when PredPol described collecting data: "PredPol takes a feed from each department's Records Management System (RMS) to collect crime type, location and date/time" or "We initially process several years of data…using a self-learning algorithm", both in document 15. Collecting data from the Record Management System has no connotation of human choice. Similarly, "process" has mechanistic connotations which are enhanced by the statement that the processing is directed by a "self-learning algorithm", as such an algorithm would be free of human choice or bias and capable of objectivity under PredPol's previously discussed framing of objectivity. This pattern is continued elsewhere in the document where PredPol used active voice sentences with themselves as the subject to describe how their technology works.

Beyond the active and passive voices, in document 15 PredPol also frequently employed nominalization, a linguistic technique that can remove responsibility for an action taken (Machin and Mayr, 2012, p. 140). In document 15, PredPol noted that they chose their

algorithm "based on the observation that certain crime types tend to cluster in time and space." In this sentence, "observation" is the term that has been nominalized, which removes the observer, in this case PredPol. By removing the observer from the sentence, they removed the human doing the observing, a human who in PredPol's framing is not capable of objectivity. In the same document, PredPol spoke of an "initial analysis", with "analysis" as the term that is nominalized, removing any humans who might have been analysing data and, therefore, their capacity for bias.

A close analysis of the above documents shows a clear pattern. PredPol used various linguistic techniques to conceal human agency in developing their predictive policing technology. These concealments, in concert with PredPol's structural oppositions, function to construct objectivity.

Objectivity and Mathematics

The status of mathematics as objective is another way that PredPol implicitly argued for the objectivity of their technology. PredPol referenced how "math" or "mathematics" was employed to create their technology across five of the documents analysed: 6, 14, 15, 16, and 20. The references to math, however, are highly nonspecific. Document 6 is the most specific, as it noted that PredPol "applies mathematical formulas similar to those used to study chemical reactions or predict earthquake aftershocks" to crime data. Documents 14, titled "Predictive Policing Technology ~ PredPol (2015)" and document 15, an updated version of that same page from 2018, merely called out the "advanced mathematics" that PredPol used in their predictive policing technology. Document 16, again on that same page but this time from 2019, discussed how PredPol's research linked crime to "a mathematical structure" before noting that, while the "mathematics looks complicated", the "behaviors

upon which the math is based are very understandable." Notably still absent from document 19 is any explanation of the mathematics itself.

The final mathematical element present in document 19 is a partial differential equation, $\frac{\partial A}{\partial t} = B + \frac{\eta D}{4}\nabla^2 A - \omega A + \theta\omega$, that PredPol referred to as their "actual patented algorithm." Johnson, McKenzie and Wong (2024, p. 930) analysed the mathematics behind PredPol's predictive policing technology and derived an equation that was "essentially" the equation listed in document 19. While at first glance it might seem that PredPol provided a significant amount of information here by displaying part of the mathematics underlying their algorithm, there was no information included that would allow someone reading to understand the equation. There was no explanation for what any of the variables or parameters A , B, η, δ, θ, ω corresponded to, either. Without clarification on those, the equation "is not meaningful to… a mathematician" (Wong, 2024).

PredPol's use of mathematical references, even though said references did not provide any direct information, did provide a specific connotation. Mathematics is commonly held as objective (Nelson, 2015, p. 25), so by emphasizing that PredPol's predictive policing technology is rooted in mathematics, PredPol could transfer the connotation of objectivity from mathematics to their technology. This is similar to the phenomenon in cosmetics advertising that Ringrow documented: scientific language in cosmetic advertising is used as a persuasive strategy, regardless of whether the consumer understands the scientific claims (Ringrow 2016, 194). The equation specifically was used in the way that Koblitz discussed, where the equation is presented as something that a person cannot argue against, and, as such, carries a connotation of objectivity.

Throughout the documents included in this analysis, PredPol used mathematics as part of their construction of objectivity. For PredPol, if something is sufficiently mathematical, it can be rendered as objective.

How Does PredPol Invoke Objectivity?

Now that it is clear how PredPol constructed their notion of objectivity, we can examine how PredPol invoked objectivity and see what purpose it served. PredPol's usage of objectivity is not wholly separable from its construction, as will be seen, as the same phrases in these documents often serve both purposes simultaneously. PredPol invoked objectivity for two key purposes: to talk to customers and to respond to critics. Each of those will be discussed in its own section, after a section explaining how this analysis has identified the two audiences of these documents: customers and critics.

Two Audiences: Customers and Critics

As discussed previously, these documents were available on the public internet, so presumably, they were written with the assumption any person could see them. That said, a close analysis of the documents themselves reveals that PredPol wrote for at least two audiences specifically. These audiences may overlap at times and should not be construed as entirely separate.

The first audience is potential or existing customers for PredPol's predictive policing technologies, such as police departments. This can be seen most directly in documents 3, 4, and 19, which are blog posts with titles that are questions directed at police departments: "Are You Holding Your Officers Accountable?" (document 3), "Are Your Recruiting And Retention Strategies Working For You?" (document 4), and "So You Think You Can Build Your Own Predictive Policing Platform?" (document 19). There are many more examples where PredPol directly addressed potential customers in the text which have been excluded due to space constraints.

The second audience is potential critics of their predictive policing technology. This can be seen most clearly in document 1, "5 Common Myths About PredPol." In this document, PredPol tried to "debunk some of the most common myths you might have heard about…our predictive policing solution." The myths PredPol tried to debunk included the idea that their technology profiled people as potential criminals or that it guaranteed arrests, both potential critiques of this technology. PredPol spoke about profiling often, and in an additional six of the documents (11, 13, 17, 18, 20) in this analysis tried to clarify that, in their view, PredPol's technology did not profile. This focus on addressing the question of whether PredPol was profiling suggests that PredPol considered potential critics as an audience of these documents.

Objectivity as a Sales Pitch: Talking to Customers

When writing to potential customers in the sampled documents, PredPol invoked objectivity as a key feature of their predictive policing technology across twelve of the documents analysed: 1, 3, 4, 6, 7, 8, 10, 11, 14, 18, 19, and 20. Some of this was very direct, such as the statement "Law enforcement agencies are choosing PredPol because of the unbiased nature of its algorithm…[i]t helps police allocate their time more effectively…where to go, how much manpower they'll need and how to help residents in the communities they serve, better protect themselves from future crime" in document 11. This statement connected the purported objectivity of PredPol with improvements in the efficiency of policing and management of officers, a theme that reoccurs in other documents: 1, 3, 4, 10, 18, and 19. Other documents explicitly connected the objectivity of PredPol's technology with crime reduction, such as the claim that "'PredPol removes the bias and…does a better job of directing officers where to be and when to be there'" in document 6, a theme that was present in several other documents: 8, 18, and 20. PredPol also argued that the objectivity of

their technology would help their customers police more equitably. In document 4, PredPol argued that, because their technology relied on the previously discussed *good data*, their technology would allow users to deliver "police services in an equitable and efficient manner." Similarly, document 18 argued that PredPol's technology, since it is objective, would allow police to better develop relationships with underserved communities.

Despite employing a structural opposition between humans and algorithms when constructing their notion of objectivity, PredPol was willing to resolve the tension of the opposition at points in certain documents. Documents 7, 8, and 14 all noted that PredPol's technology did not replace the "experience and intuition" of police officers. Notably, PredPol did not employ structural oppositions between humans and algorithms in these same documents, instead focusing on PredPol's connection to mathematics as a source of objectivity and its reliance on *good data* in these documents. Note that this example can also be seen as PredPol using objectivity to respond to critics, but the critics, in this case, are potential customers as well.

While different documents focused on specific purported benefits of objectivity, PredPol invoked objectivity as a sales pitch for their product across all of them.

Objectivity as Response to Critics

PredPol invoked the objectivity of their technology in response to potential criticism in eight of the documents analysed: 2, 4, 5, 8, 12, 14, 17, and 18. These statements tended to focus on how the objectivity of their predictive policing technology protected the civil liberties or privacy of people who were policed. In document 18, PredPol stated "[r]educing victimization is a hollow victory, however, if it means people have to give up their civil rights or privacy protections along the way. That's why we have consciously worked to ensure that the data and algorithms we use are as objective and transparent as possible".

Documents 4, 5, 8, 12, 14, and 17 invoked objectivity more subtly, through the structural opposition of *good data* and *bad data*. These documents argued that since PredPol did not use *bad data,* such as personally identifiable information (PII), PredPol's technology protected civil liberties.

The lone outlier document, document 2, titled "Are We at a Tipping Point in Police-Community Relations?" took a much broader scope. Rather than arguing that the objectivity of PredPol's technology prevents the technology itself from causing harm, PredPol argued in this document that objectivity, provided by PredPol and potentially others, is the necessary basis to solve the problem of policing and racial inequality. Objectivity was key throughout this document, which mentioned the need for "objective discussions of the problems of racial inequality in America" and the need for "objective, agreed-upon facts that can be used to guide the discussion [on racial inequality in America]." PredPol centred themselves as a potential provider of this objectivity, as they noted that the company was founded to provide "less bias" to policing. PredPol still invoked objectivity as a response to potential critics, though this time to the entire project of policing as opposed to their technology specifically. This is the strongest claim that PredPol made: that their technology could provide objective facts that would enable an objective analysis of social problems.

Some of the documents invoked objectivity both as a sales pitch to potential customers and as a response to critics. This is seen most directly in document 18, where PredPol argued that cognitive bias of police officers can lead to the "perception that officers are unfairly targeting certain neighborhoods" which "can justifiably undermine trust between the community and police." PredPol's objective predictive policing technology is positioned as a solution to this issue in document 18. This statement spoke to both audiences, as potential customers for PredPol could have seen it as a claim that this technology would bring

objectivity to policing that would allow them to avoid the perception of unfair policing, while critics could have seen it as a way to reduce overpolicing.

Is PredPol's Construction of Objectivity Captured by Daston and Galison's Taxonomy?

PredPol's construction of objectivity is not completely captured by any of the four epistemic virtues taxonomized by Daston and Galison: truth-to-nature, mechanical objectivity, structural objectivity, and trained judgment. PredPol's objectivity is most similar to mechanical objectivity, but it also contains elements of structural objectivity and trained judgment. There is no element of truth-to-nature.

PredPol's construction of objectivity is most similar to Daston and Galison's notion of mechanical objectivity. Recall that a key element of PredPol's construction of objectivity was structurally opposing humans, who are subject to bias, against algorithms, which are capable of objectivity. In document 18, PredPol defined an algorithm as "the instructions used (generally by a computer) to process information and arrive at an answer." This definition emphasised that using an algorithm involves mechanistically following a set of instructions. PredPol's construction of objectivity as something achievable by a mechanistic process devoid of human input aligns with mechanical objectivity, as mechanical objectivity calls for scientists to create images mechanistically, without imputing the image with the perspective of the scientist. This aligns with other work done by Galison (2019) discussed earlier, where he explicitly connected algorithms and mechanical objectivity.

PredPol's use of mathematics, however, drew in elements of structural objectivity. Recall that structural objectivity attempted to move past the use of sight and found objectivity in what scientists viewed as unchanging structures such as equations. As described above, PredPol repeatedly focused on the mathematical background of their predictive policing technology as a source of objectivity, including displaying a partial differential equation

prominently in document 16. While the use of mathematics is not sufficient to argue that PredPol's construction of objectivity is more similar to structural, rather than mechanical, objectivity, it does make categorising PredPol's objectivity as strictly mechanical an overstatement.

More troubling are PredPol's repeated statements about how their predictive policing technology should work with the intuition of police officers and analysts. In document 7, PredPol stated that "veteran officers" who are experienced at their jobs or analysts who have been trained on how to properly conduct crime analysis could supplement the analysis provided by their predictive policing technology. In short, veteran officers and analysts are people who have been trained in ways that allow them to supplement the output of a mechanically objective process, PredPol's algorithmic predictive policing technology. This aligns very well with Daston and Galison's idea of trained judgment that was discussed in the literature review. At the same time, document 6 noted explicitly that analysts "tend to skew their data, placing more emphasis on recent crimes", which works against the idea of trained judgment modifying a mechanically objective process.

What Topics Are Frequently Invoked Alongside Objectivity?

While analysing these documents for reference to objectivity, it became clear to me that "transparency" was frequently invoked alongside objectivity. In document 18, PredPol specified that they had worked to make their algorithm "as objective and transparent as possible" and noted how it is desirable to have "an objective set of transparent criteria" to guide where officers will patrol. Of the twelve documents that were returned by the objectivity search string, six of them also contained references to transparency. In particular, the five documents that specifically included the words "objectivity" or "objective" also included specific references to transparency.

Additionally, PredPol's blogs had a "tag" system, where blogs were tagged with terms related to their topic. Two blogs found with the objectivity search string were tagged under "transparency". Further investigation using the PredPol archive showed that PredPol did not have a tag for "objectivity", "objective" or "bias". This suggests that PredPol thought transparency was a more important term than the others, as they wanted to make it easy for potential readers to find articles that discussed transparency.

Discussion

This project set out a primary research question to understand how PredPol constructed and invoked objectivity in promotional materials for their predictive policing technologies on their website. It found that PredPol constructed objectivity through a variety of linguistic strategies, most notably a series of structural oppositions that contrasted an objective algorithm against biased humans, as well as language of concealment (such as nominalization) and language connecting their technology to mathematics and mathematics' status as objective. I noted both an absolute and a relative sense of objectivity but was not able to find a pattern in how PredPol invoked each sense. My analysis also showed that PredPol invoked objectivity primarily as a sales pitch to potential customers and to respond to potential critics of the technology.

Two secondary research questions were also considered, the first being how PredPol's construction of objectivity fit into Daston and Galison's taxonomy of objectivity and related epistemic virtues. My results showed that PredPol's construction of objectivity included significant elements of two virtues and did not cleanly fit into just one. The second question was an open-ended search for other terms that were frequently used alongside objectivity. *Transparency* was identified as frequently being included alongside objectivity. The remainder of this section will explore the implications of the answers to these research questions, specifically how they reflect on existing literature around predictive policing technologies and objectivity, as well as discuss the limitations of this study and potential avenues for future research.

PredPol and Competing Epistemic Virtues

As discussed previously, PredPol's construction of objectivity does not fit entirely within mechanical objectivity. Their construction is certainly similar to mechanical objectivity, but it also has strong elements of trained judgment. Does this suggest the emergence of a new epistemic virtue that is not captured by Daston and Galison's taxonomy? No, for three reasons: two conceptual and one more practical.

Trained judgment, as discussed in the literature review, is an epistemic virtue that was developed after mechanical objectivity, as a supplement to it (Daston and Galison, 2010, p. 314). It allowed scientists, with appropriate training, to interpret the outputs of mechanically produced images using their subjective expertise. PredPol's positioning their technology as a mechanically objective process that is later interpreted by trained police analysts and veteran police officers is well described by the virtue of trained judgment. Thus, PredPol's emphasis on both the trained judgment elements and mechanically objective elements of their technology does not raise a conceptual challenge to Daston and Galison's taxonomy.

Additionally, this project has only shown a conflict between these two epistemic virtues in texts produced by PredPol. In isolation, this does not reveal how objectivity is performed by analysts or police officers in practice. Though this analysis assumes that society and language shape each other, a claim that a new epistemic virtue is emerging should be supported with evidence that relevant people are operating under that virtue. Such evidence could be provided with ethnographic analysis, but that is outside the scope of this project.

The practical reason that PredPol's construction of objectivity does not suggest the birth of a new epistemic virtue is that there is a simpler argument that explains this: PredPol was attempting to eat their cake and have it too. Waardenburg, Sergeeva, and Huysman (Waardenburg, Sergeeva and Huysman, 2018, pp. 98–99) noted how the introduction of new

technology into an occupation can create conflicts. PredPol's statements concerning how their technology can work with officers and analysts suggest an attempt to proactively resolve conflicts between existing workers and new technology. In short, PredPol was presenting their technology to police departments as a solution to bias in policing while attempting simultaneously to avoid tension among the human workers who would have to accept their technology, despite the structural opposition they created between their algorithms and humans.

Objectivity's Status in Existing Work on Predictive Policing

The results of this project complicate the claims of existing sociotechnical imaginaries of predictive policing. Stimmel described a sociotechnical imaginary where predictive policing would provide police reform through objectivity, a claim that some of PredPol's documents supported. PredPol explicitly used the objectivity of their predictive policing technology as a selling point, arguing that it would reduce over-policing and remove the perception of officer bias against communities, which are tantamount to claims of reform through objectivity. Chan's utopian imaginary was also supported by some of the claims made by PredPol, as Chan's utopian imaginary focuses both on efficiency gains and predictive policing technology's status as based in fact.

As discussed previously, PredPol's discussion of their technology did not stick purely to objectivity but included elements of trained judgment. This is at odds with the previously described sociotechnical imaginaries that emphasised reform through objectivity, as trained judgment allows for a significant component of human subjectivity. Similarly, these results question Scannell's claim about objectivity and predictive policing. Certainly, this analysis of a single technology does not overturn the claims of these imaginaries. Perhaps further case studies of other predictive policing technologies will render PredPol's split focus between

mechanical objectivity and trained judgment an outlier. Future work may show that PredPol's customers were attracted to the technology because it allowed them to claim that their policing was objectively guided without devaluing their existing officers and analysts. Defending that claim is outside the scope of this project. Further work would be needed.

PredPol's embrace of both mechanical objectivity and trained judgment aligns well with the findings of Waardenburg, Sergeeva, and Huysman in their predictive policing case study. Recall that they found a rise in the influence of "intelligence officers" who, as subjective humans, interpreted outputs of the purportedly objective predictive policing technologies and guided police responses. This is similar to PredPol, who constructed their technology as mechanically objective but advertised it as a tool that could be combined with the experience of data analysts and experienced police officers. Additionally, PredPol's embrace of trained judgment provides an example of algorists moving beyond the single-minded focus on mechanical objectivity that Galison (2019) noted.

Transparency and Objectivity

As noted in the results section, transparency was frequently invoked alongside objectivity in the documents included in the CDA. Given the similarity between PredPol's construction of objectivity and Daston and Galison's notion of mechanical objectivity, this is not surprising. Daston and Galison (1992, pp. 147–148) note how advocates of mechanical objectivity strive to document all the steps used to produce their images. This can be understood as an attempt to make the process of creating the image transparent to other scientists.

That said, I was not able to fully investigate PredPol's construction of transparency in this project. As noted in the results, it did seem that PredPol was more concerned with potential readers finding blogs about transparency than objectivity or bias. This suggests that

transparency plays a larger role in the sociotechnical imaginary of predictive policing than is

currently documented. More study is needed, however, to fully articulate and defend this

claim.

Limitations

This project is limited in a few small ways. The first is that it was only able to

consider a fraction of the potential material produced by PredPol discussing their predictive

policing technology. Of the hundreds of archived web pages available to me, I was only able

to analyse 20 documents with the close reading necessary for critical discourse analysis. To

mitigate this, I used a method of filtering and manual review to guide me to the most relevant

documents. Additionally, I was not able to include their new website from when they

rebranded as Geolitica or SoundThinking's website after the technology was sold to them.

While I am confident that my method guided me to the documents most relevant to my

analysis, if my project had been able to include a broader collection of documents, it likely

would have produced a more complete analysis.

Similarly, this project was focused on a single predictive policing technology, the

version created by PredPol. Focusing on a single technology allowed me to provide a deeper

analysis, which has created what I hope will be a valuable case study. At the same time,

focusing on a single technology is inherently limited and does not on its own suggest that

results here will be generalizable to other technologies, though it can act to inform future

researchers as to what they might look for in other predictive policing technologies.

This project used CDA as its primary methodology. A common criticism of CDA as a

method is that it is too "selective, partial and qualitative" (Machin and Mayr, 2012, p. 213).

My extensive literature review helped mitigate this, as the literature helped to situate my

findings in a broader analysis to combat the selectivity and partiality that some claim is

inherent in a CDA. I have regularly interrogated my own biases during my data collection

and analysis to help mitigate this as well.

Future Research

Several areas of future research emerge directly from the limitations of this study.

Conducting this study with additional time and support to read a larger collection of

documents could provide a more in-depth analysis of PredPol's predictive policing

technology than I was able to.

Another area for future research would be to conduct a similar study on other

predictive policing technologies, such as HunchLab. This would create a collection of case

studies on the construction and use of objectivity with respect to these technologies, which

would hopefully help answer the outstanding questions around sociotechnical imaginaries of

predictive policing previously discussed.

As noted previously *transparency* was noted as another key term during my analysis.

Future studies employing CDA or other methodologies that study how transparency is

constructed or deployed with predictive policing technologies would also potentially help

clarify the sociotechnical imaginaries of predictive policing.

Finally, employing more expansive methods that can help to mitigate concerns around

the selectivity and partiality of CDA is a potentially fruitful avenue of research. This could

include incorporating corpus studies alongside CDA as described by Machin and Mayr

(2012, pp. 215–216). This would include quantitative analysis based on linguistic analysis

that could help to ensure that the documents examined are representative of the larger dataset

(Machin and Mayr, 2012, pp. 215–216). Another option would be to employ ethnographic

methods (Machin and Mayr, 2012, p. 217), though given that this is a project on predictive

policing technologies, it may be difficult to get access to the necessary people to perform an

ethnography of any kind.

Conclusion

In setting out to explore how objectivity was constructed and invoked by PredPol, much of the existing literature pointed me towards a relatively straightforward claim about predictive policing technologies promising algorithmic objectivity as a means to reform policing. What I ultimately found was more complicated. PredPol vacillated between a straightforward vision of reform through mechanical objectivity and a vision of trained judgment as a benefit of its technology. This points to the need for further study to clarify the claims made about sociotechnical imaginaries. Furthermore, this conflict between my results and the broader work on sociotechnical imaginaries points to the importance of focused, case study analysis of particular technologies as a potent tool for informing sociotechnical imaginaries.

PredPol, one of the pioneers in predictive policing technology, no longer exists as an independent company (Mehrotra and Cameron, 2023). Their technology, however, lives on as part of SoundThinking (Mehrotra and Cameron, 2023). SoundThinking has also purchased HunchLab, another predictive policing technology company (Mehrotra and Cameron, 2023). SoundThinking still offers predictive policing technology, though rebranded as "resource management for police departments" (Mehrotra and Cameron, 2023). PredPol might have gone away, but predictive policing technology has not. Given the life-altering—and sometimes life-ending—effects of predictive policing technologies, further scrutiny is needed now more than ever.

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Appendices

Original Documents

Links to the 20 documents that were used in the CDA are included below for reference.

Doc Number	Link
1	https://web.archive.org/web/20190415082539/blog.predpol.com/5-common-myths-about-predpol
2	https://web.archive.org/web/20200713043949/blog.predpol.com/are-we-at-a-tipping-point-in-police-community-relations
3	https://web.archive.org/web/20190418152832/blog.predpol.com/are-you-holding-your-officers-accountable
4	https://web.archive.org/web/20190418152839/blog.predpol.com/are-your-recruiting-and-retention-strategies-working-for-you
5	https://web.archive.org/web/20190109015521/blog.predpol.com/caliber-is-excited-to-announce-its-partnership-with-predpol-inc
6	https://web.archive.org/web/20141030042908/http://www.predpol.com/dr-jeff-brantingham-featured-in-ucla-article-on-predpol/
7	https://web.archive.org/web/20140929214446/http://www.predpol.com/how-predpol-works/
8	https://web.archive.org/web/20170224132415/http://www.predpol.com/how-predpol-works/
9	https://web.archive.org/web/20190502181646/https://www.predpol.com/how-predictive-policing-works/
10	https://web.archive.org/web/20190418152844/blog.predpol.com/just-driving-around-isnt-a-patrol-strategy
11	https://web.archive.org/web/20170728033321/blog.predpol.com/machine-learning-and-policing
12	https://web.archive.org/web/20170814105502/blog.predpol.com/not-all-predictive-policing-is-created-equal-heres-why
13	https://web.archive.org/web/20120617181546/predpol.com/technology
14	https://web.archive.org/web/20150206033632/http://www.predpol.com/technology/
15	https://web.archive.org/web/20180111034637/predpol.com/technology
16	https://web.archive.org/web/20190212174426/https://www.predpol.com/technology/
17	https://web.archive.org/web/20170726111846/blog.predpol.com/predictive-analytics-beyond-policing
18	https://web.archive.org/web/20180307155938/blog.predpol.com/predpols-stance-on-privacy-civil-rights-transparency
19	https://web.archive.org/web/20181216213051/blog.predpol.com/so-you-think-you-can-build-your-own-predictive-policing-platform

20	https://cdn2.hubspot.net/hubfs/3362003/White%20Paper%20Science%20&%20Testing%20of%20Predictive%20Policing.pdf

Data Created Through Scraping

A significant amount of data gathering and cleaning was done by me to support this project. The results have been made available on GitHub through the link below:

https://github.com/tzamboiv/dissertation-appendix-two-resources

At time of writing, it contains a table with all 152 unique blogs that I was able to find on the website alongside those blogs saved as .html files in the "blogs" directory. It also includes tables of timestamp data for "blog.predpol.com" and "predpol.com" that were collected via the Wayback Machine.