

Bachelor Thesis

The use of Predictive Policing in German law enforcement- A discourse analysis

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Abstract

This paper examines the discussion of the Predictive Policing tool in the German police. Specifically, the research question *In what ways is Predictive Policing discussed in German policing reports, statements, and policy documents?* is examined.

A discourse analysis is conducted to figure out the meaning that is assigned to Predictive Policing in official policing reports. For this, policing reports and press releases of the state offices of criminal investigation in the six German states that have implemented the tool are used as data. This data is freely available on the websites of the respective institution. The results of the analysis will bring clarity to the topic of how Predictive Policing is portrayed by the German police. Producing certain meanings with their presentation of Predictive Policing shapes the opinion of the public as well. Moreover, this topic has not been researched before in a scientific article yet to my knowledge. Therefore, this research is of social and scientific relevance. Results show that first and foremost definitions are the subjects to discussion and Predictive Policing is always connected to the terms crime prevention and risk assessment. Additionally, Predictive Policing and its underlying software are used to establish a structured data analysis within the police department that ideally results in a more strategic and efficient deployment of patrols.

List of Abbreviations

AI Artificial Intelligence

LKA Landeskriminalamt (state office of criminal investigation)

BLKA Bayerisches Landeskriminalamt (Bavarian state office of criminal investigation)

1. Introduction

1.1 Background

With digitalisation speeding up and the invention and improvement of technology resuming further, the role of Artificial Intelligence is becoming increasingly more important in various sectors of public life, including law enforcement in the criminal justice system. There are various areas of application for AI in the criminal justice system, spanning from facial recognition to the protection of critical infrastructure (Velasco, 2022). One of the most prominent tools in law enforcement benefitting from AI is Predictive Policing. Predictive Policing is an algorithmic-driven tool used to predict future crimes on the basis of large data analysis. Not only does the algorithm predict geographical locations where crimes are more likely to happen, it also analyses historical data of persons and determines their risk of committing a crime (Asaro, 2019). This tool, however, brings not only advantages, but risks and issues with its use as well.

Due to the increasing usage of this tool, it is the subject of various scientific articles that discuss its potential and limitations. Gstrein, Bunnik and Zwitter examine “persistent concerns relating to the social, ethical and legal domain” (ibid., 2019). They discuss the risks and concerns facing the use of AI such as data selection, transparency, and machine bias. In the end, it is concluded that it is essential to address the concerns and thus make the work of law enforcement agencies ethically acceptable and more efficient with the use of Predictive Policing.

The central concern regarding Predictive Policing, highlighted in the literature, is that it reinforces prejudice and is based on discriminatory biases (Asaro, 2019). Asaro discusses these ethical issues with a focus on implementation of data-driven management, using Predictive Policing in the city of Chicago as an example. However, this example is focused on projects combatting gun violence, since this is a major issue of the US criminal justice system.

Predictive Policing aims at preventing crimes and is used to adapt the area coverage of police patrols based on the algorithm’s calculations (Hardyns & Rummens, 2018). While these calculations are made in retrospective, there are developments pushing for prospective analyses to achieve a more dynamic analysis of crime hotspots (ibid., 2017). The authors examine in this article three predictive analysis applications which are used in the US and the Netherlands, while they additionally lay out an overview of what Predictive Policing is and what it is used for.

Another article inspects AI systems in criminal justice in connection with human rights. The author first describes the role of automation in crime control and criminal courts. He raises the concern that the already used systems oftentimes “lack basic transparency” (Završnik, 2020), since access to the underlying algorithms is not permitted. Završnik concludes that AI currently in use is opaque and cannot ensure compliance with human rights (ibid. 2020).

Timo Rademacher describes the status quo of AI usage in German law enforcement in his article. He discerns that Germany is “much more hesitant to allow law enforcement agencies to rely on data mining as soon as person-based data is analyzed” (Rademacher, 2019) than the US is.

1.2 Research gap

As the state-of-the-art shows, the research is generally focused on ethical concerns of AI usage and Predictive Policing. Moreover, there is a lack of examining German law enforcement, as most articles mainly focus on the USA or on the Netherlands as its cases. This paper adds to the existing literature by investigating the use of language to confer certain meanings to the reader. It goes beyond an abstract description of Predictive Policing but works with the case of Germany. By providing an overview of information that can be found on Predictive Policing and basing it on the current applications and developments of Predictive Policing as a tool, the first step of the analysis is done. Various documents that depict the attitude of policy makers and police officials will be examined to get an overview of how the Predictive Policing is perceived, the key word here being perceived. Taking the previously conducted short literature review into account as well, this topic cannot be found yet in existing research and therefore poses a research gap, as existing research has its focus either on other countries or only on summarising the current state of Predictive Policing.

1.3 Research questions

In this thesis, it is intended to analyse official policy documents and police statements regarding the usage of AI-driven Predictive Policing. It will be analysed how the role of AI, specifically Predictive Policing in the German law enforcement is portrayed and discussed in these documents. Based on this, the following research question can be derived:

In what ways is Predictive Policing discussed in German policing reports, statements, and policy documents?

Since this is still a broad question, the following four sub-questions will narrow the topic even further down to four aspects which will be examined in the paper. These aspects guide the analysis and shed light on the four main topics discussed in the literature on Predictive Policing.

Deriving the meaning attributed to Predictive Policing is the first step to understanding its role in today’s police work. For this reason, the first sub-question is as follows:

1. What are the meanings attributed to Predictive Policing?

Besides getting to know the different definitions discussed in policing reports and other related documents, the areas of application are the next step in investigating the topic.

2. What are the envisioned uses of Predictive Policing?

Using Predictive Policing needs to result in advantages and improvements to regular police work. So the third sub-question investigates what contributions to regular police work the implementation of Predictive Policing is hoped to achieve.

3. What are the alleged contributions to regular police work?

For the last sub-question, a look at the future of Predictive Policing in German law enforcement concludes the analysis. As technology further develops, new opportunities for the use of AI, including Predictive Policing, emerge and new challenges arise. The last sub-question therefore investigates how policy makers and police officials see the future of the tool.

4. Which prospects for the use of Predictive Policing are discussed in the literature?

In short, the sub-questions two to four build on the first one and examine how the use is portrayed and to what extent it contributes to the current police work while lastly, it shall be examined how the future developments and opportunities of the tool are presented. These aspects aim at discovering how the public's opinion is shaped by the wording. The emphasis of advantages or disadvantages, of risks and opportunities, influence this and can be investigated based on the research questions. Investigating these four sub-questions will lead to answering the main research question *In what ways is Predictive Policing discussed in German policing reports, statements, and policy documents?*.

2. Theory

2.1 Introduction

The theory section serves the purpose of introducing the for this thesis underlying concept of Predictive Policing. Predictive Policing is a broad term and there is no one understanding and approach to the concept. Therefore, scientific literature needs to be consulted in order to get a clear comprehension of the topic. The concept of Predictive Policing will be presented in terms of definitions found in the literature and arguments that are being discussed by scientific experts in scientific discourse. These key issues in the debate around Predictive Policing will focus on the four sub-research questions introduced in the previous chapter. Moreover, the key theoretical insights derived from the literature will be presented at the end of the section.

2.2 Discourse

Discourse is defined as “the use of language to communicate in speech or writing” (Cambridge Dictionary). A particular choice of words is used to infer meaning into the spoken or written expressions. Scientific literature adds a definition of discourse analysis to this. Taylor defines it as “the close study of language and language use as evidence of aspects of society and social life” (Taylor, 2013). This means that a discourse analysis is the tool – or rather a method - to decipher the meanings and put them in a societal context. A discourse analysis is not a discourse analysis per se, as there are multiple forms to it.

Discourse is linked to the concept of power, at least Foucauldian discourse analysis is. (Cook, 2008). This power is inherent in language and can be deduced by conducting a discourse analysis (ibid.) The goal of this thesis is to analyse policing reports and policy documents which were released by German governmental institutions and their subordinated federal investigation offices. These institutions are a part of the power structure inherent to the state. Furthermore, the concept that is to be investigated, namely Predictive Policing- is used by authorities subordinated to the state to police society and impact it. This impact displays a power dynamic between the police and the public in which the portrayal and discussions around Predictive Policing are involved.

Discourse can be found in every section of public debate, including security related themes. Security discourse in the political sphere partially falls under the directive of the federal ministry of inner affairs, as police agencies are subordinated to this institution in Germany. Security discourse revolves around various subjects such as border security or terrorism. Additionally, newer topics such as climate security (von Lucke, 2023) and cyber security emerge in the light of recent challenges and developments in the area of Artificial Intelligence. A lot of definitions can be found in scientific literature on AI, however, the main characteristics of these definitions are mostly the same. The first definitions were formulated in the 1950s where AI was defined as reproducing human intelligence with machines (Helm et al., 2020). The most prominent characteristic of AI today is that it can

perform tasks while learning and evolving (Ng, T. K. et al., 2021). AI is deeply connected with machine learning. Based on the analysis of large data sets, algorithms improve their predictions of computed outcomes (Helm et al., 2020).

The ultimate goal is not only to combat these security issues but also to prevent them from happening, as is the narrative in home burglary debates. To achieve this, the official stakeholders have introduced new concepts to German law enforcement. Predictive Policing is one of those concepts.

2.3 Predictive Policing

Predictive Policing is a form of AI and it therefore builds upon the concept of AI.

The definition of Predictive Policing is widely agreed upon within scientific literature on the topic. The characteristics attributed to Predictive Policing are for one that it is based on an algorithm and secondly that it uses “historic crime data to identify individuals or geographic areas with elevated risks for future crimes” (Asaro, 2019). Egbert defines Predictive Policing as “the utilisation of analytic-technical procedures by the police in order to forecast probable short-term sources, places and/or times of future crimes” (Egbert, 2018).

The algorithm calculates the statistical probability that a crime will take place based on this data. The results of the algorithmic analysis are used to adapt the work plan of police patrols in order to increase their presence at the predicted locations (Knobloch, 2018). Overlapping characteristics of Predictive Policing can clearly be made out from scientific literature. The software assesses the risk or probability of a crime taking place based on datasets and enables the prevention of crimes. These three characteristics of Predictive Policing will be relevant in the coming chapters, because they will guide the analysis to better understand how Predictive Policing is portrayed and discussed in the analysed documents.

The underlying assumption for the use of Predictive Policing is that technology can predict crimes accurately and that the police is going to take action in order to reduce and prevent crimes based on the technology’s computational results (Moses & Chan, 2016). Egbert also highlights that Predictive Policing is not only about the technology behind the prediction, but it also is a “multi-level policing strategy” (Egbert, 2018) which includes the necessity of reacting to the algorithms’ results. The algorithm alone cannot prevent crime from happening, it is the police officers who do that.

This leads to the examination of how the possible contributions of Predictive Policing to regular police work are discussed in scientific literature.

The prevention of crime has not only gained attention in police work with the advent of Predictive Policing, but it has been an important part of it before. Criminal analyses were already conducted before algorithms were widely introduced. Egbert and Leese (2021) claim the use of Predictive Policing can “change parts of the police profession into a more scientific, data-focused way of working”. The authors argue as well that the use of Predictive Policing complements the regular police work (Egbert & Leese, 2021).

The method of Predictive Policing is predominantly used for assessing the risk in the fields of home burglary and theft (Hardyns & Rummens, 2018). There are two different forms of Predictive Policing. It is differentiated between geospatial Predictive Policing and predictive profiling (Egbert, 2018). Geospatial Predictive Policing uses for example a hotspot analysis and maps areas where a high concentration of crimes can be found within a certain amount of time. Another method used besides the hotspot analysis is the risk terrain modelling which creates a risk map of “locations sensitive to high crime rates, based (only) on their spatial properties and the interactions of those properties” (Hardyns & Rummens, 2018). Person-based Predictive Policing calculates the probability that a person will commit a crime based on risk factors (Knobloch, 2018).

Predictive Policing is furthermore tightly connected to technologies such as machine learning, artificial intelligence, and big data. The algorithm is equipped with the former two technologies while it uses the latter as a data source for its calculation. The spatiotemporal approach is the approach used in Germany. German police departments that use Predictive Policing mainly let the software compute hotspots that are at an increased risk of home burglary (Egbert, 2019). Here, we can also find the context that Predictive Policing is used in Germany. Theft and burglary are the areas of application where Predictive Policing is used in German policing. The use of Predictive Policing tools aims at a resource-efficient deployment of police officers while reducing the number of crimes (Knobloch, 2018). These are the main goals of German Predictive Policing found in the literature.

While not focussing on the ethical issues that come with Predictive Policing in this thesis, a short oversight of the key issues raised by scholars needs to be provided, since this is a large area of research and criticism altogether. Almost every scientific paper found on the topic of Predictive Policing is either focussing on the ethical implications and concerns the application brings forth or at least discusses them in some way. One argument made is that Predictive Policing poses an intrusion to citizens’ private lives. The right to privacy is highly respected in European countries and needs to be preserved. The lack of transparency on the function of algorithms is seen as critical and unlawful. This can be seen in the decision of the German Constitutional Court which deemed the use of the Palantir software in Hamburg and Hessen as unconstitutional (Bundesverfassungsgericht, 2023). The District Court of The Hague comes to a similar conclusion with a software used in the Netherlands and decides the advantages do not outweigh the disadvantages since it is not a “sufficiently justified intrusion into private life” (Strikwerda, 2021). Furthermore, concerns regarding a racial bias are raised. This discussion is foremostly taking place in the US and sheds light to discrimination against African American and Latin American citizens (Knobloch, 2018). These ethical issues are not a large part of the analysis in this paper though. First, these are already frequently discussed in the context of Predictive Policing, and second, German police has only implemented geospatial-based analyses which do not raise as many ethical issues as person-related data used for profiling, so it is simply more logical to focus on other aspects of Predictive Policing for the analysis. The only two aspects relevant

for the analysis that are linked to the ethical discourse are transparency and accountability which close the circle back to Germany's constitutional court's ruling.

2.4 Development

To place the concept in a temporal context, the development of Predictive Policing is shortly presented. The past developments are not as important as the future ones – as part of the fourth sub-research question -, so the focus lies on those.

Los Angeles was the first city to implement Predictive Policing in 2011. The software PredPol was developed by the University of California and the Los Angeles Police Department and its use has spread to other US cities and even to the United Kingdom (Hardyns, 2017).

The use of Predictive Policing in Germany is still limited, only six out of sixteen federal states have introduced an algorithmic software to their police departments (Knobloch, 2018). The first software, PRECOBS, was introduced in the state of Bavaria in 2015. The application is moreover limited to location-based predictions and does not include person-based predictions.

Future developments are discussed in the scientific literature as well. Egbert and Leese (2021) predict an organisational change that the wider use of Predictive Policing will bring to police organisations. They expect that crime prediction will not become fully automated but will still consist of manual elements as well. The technical equipment alone needs to be updated in order to keep up with consistent analyses of large sets of data (ibid.). However, they also shed light on more problematic aspects that need to be considered in the ongoing work with Predictive Policing. Police organisations need to address the issue of data collection in terms of transparency and accountability (Egbert & Leese, 2021) which links back to the last paragraph of the previous *chapter 2.3* about the ethical discourse on Predictive Policing.

2.5 Concluding remarks

To conclude this theory section, the theoretical insights gained from the literature will now be presented. For the first sub-question “*What are the meanings attributed to Predictive Policing?*” it is expected to find a focus on the aspects of crime prevention, risk assessment, and a data-driven approach to work in the analysed documents. The second sub-question “*What are the envisioned uses of Predictive Policing?*” is expected to be answered – based on the scientific literature – with the mention of statistical, standardised data analysis that contributes to an enhanced and more efficient planning of police work, especially police patrols. The assumption for the third sub-question “*What are the alleged contributions to regular police work?*” is that the use of Predictive Policing in German law enforcement is embedded into a “multi-level policing strategy” (Egbert, 2018). This means that the police include their own action into the strategy and views Predictive Policing as an assisting tool to increase their efficiency in handling high-crime areas and reducing crime rates instead of letting the software completely control the workday with its results. For the fourth and last sub-question “*Which*

prospects for the use of PP are discussed in the analysed documents?” the scientific literature suggests a debate revolving around topics such as organisational reform in policing agencies, the improvement of existing technology and ethical topics such as transparency and accountability which include discussions of data protection. With these expectations in mind, the next chapter will focus on the methodological approach to the research question.

3. Method

3.1 Introduction

The following chapter illustrates how the research questions will be answered in this thesis. First, the chosen case of Germany will be described and why it is interesting to investigate. While discourse around Predictive Policing started as early as the 1990s, first projects and testing phases were conducted in the starting years of the 2010s in Germany. Second, the research method will be presented and most importantly it will be discussed why a discourse analysis is the most fitting method to answer the research questions. In addition, the coding scheme will be provided in this section. The coding scheme receives a short and illustrative elaboration on how it is embedded in the subsequent analysis chapter. Lastly, the method of data collection will be described. This chapter serves the purpose of providing an in-detail description of the analysis process in order to enhance the accountability of this thesis.

3.2 Case selection

The case of this paper deals with the narrative on Predictive Policing found within policing reports in Germany. Predictive Policing as a tool is used in Germany in six federal states. The first one to implement the tool is Bavaria in 2015. Bavaria and Baden-Württemberg use the software Precobs, which was developed in the German city Oberhausen, and which is similar to the US software PredPol. North-Rhine Westphalia and Berlin use self-developed software called SKALA and KrimPro respectively, which include a more complex approach to geospatial Predictive Policing. Hessen and Lower-Saxony have refined already existing software to meet their needs (Knobloch, 2018). Each federal state has first conducted a pilot program to develop and test their software before launching it officially. Predictive Policing in Germany is moreover only used in the context of home burglary with the geo-spatial approach. Other areas of application are discussed and tested but not practiced in police work.

It is especially interesting to examine the case of Predictive Policing in Germany, since data protection is an essential value in German politics, the *Recht auf informationelle Selbstbestimmung* is even secured by the German constitution (BfDI) and on a higher level by the Charter of Fundamental Rights of the EU (Gstrein et al., 2019). Data protection is critically viewed by scholars and critics of the concept alike. Additionally, Predictive Policing is not as often used in German policing than in, for example, American policing. It is therefore a rarely discussed topic and worth looking into.

3.3 Research method

To answer the research question *In what ways is Predictive Policing discussed in German policing reports?*, a textual analysis will be conducted in this paper. The textual analysis is usually a qualitative method and examines either “the content and meaning of texts or their structure and discourse”

(Lockyer, 2008). There are two different types of textual analyses, the content analysis, and the discourse analysis. The content analysis' assumption is that text is open to interpretation and its goal is to uncover messages conveyed by the text (Lockyer, 2008). The discourse analysis examines the way language is used to infer meaning into the written or spoken words which is created in a social context. Social reality is seen as a construct. Depending on the approach, discourse analysis focusses either on the structures of interactions or on the operationalised power that is inherent in language (Cook, 2008). The textual analysis, specifically the discourse analysis, was chosen as the fitting the research design for the research question since it is the goal of this paper to examine the current discourse and hereby the use of language in official policing reports concerning Predictive Policing. Moreover, the institutions' reports and documents are released by governmental ministries and their subordinated agencies, which are a part of the power structure inherent to the state. Therefore, a discourse analysis is able to discover the intentions underlying the written documents and put it into the context of document types that each have their own functions.

Including the four sub-questions, the analysis' aim is to deduce the meanings that are attributed to Predictive Policing, how the usage is portrayed, how the contributions to already existing police work are presented, and how potential future developments are discussed in the investigated documents. To achieve this, the discourse analysis is the most suitable method.

The codes derived from the concept of Predictive Policing will be taken as a basis for the analysis of these documents to examine the research questions. It has to be mentioned that the analysed documents will be in German, therefore the coding scheme has to be translated into German as well for the analysis and back to English for the thesis. The codes are oriented on the four sub-questions. Based on the theoretical insights from the theory chapter, codes were derived that aim to represent the key aspects of each topic. The coding scheme is provided below.

Fig. 1: Coding scheme

Concepts	Meaning attributed to Predictive Policing	Application of Predictive Policing	Contributions to regular police work	Prospects of Predictive Policing
Codes	Data-driven	Strategic planning	Resource efficiency	Organisational reform
	Crime prevention	Software-based (statistical) data analysis	Reducing crime rates	Transparency
	Risk assessment		Complementarity	Accountability
				Technological development

These codes are the guidelines for the analysis in atlas.ti. The documents will be imported to the software atlas.ti to facilitate the coding process. Atlas.ti is a research tool for qualitative data analyses that helps keeping the analysed documents organised and the coding process clear. Although atlas.ti was used for organisational matters regarding the display of documents, the coding was done manually without consulting features of atlas.ti. This means that each document was regarded in a structured way and suitable text passages were marked with the respective codes. From these codewords, more specified words or phrases were derived. These words are sub-categories to the codes and were searched for in the documents. For example, to find a corresponding paragraph for the code “complementary” in the documents, words such as “support” would indicate a suitable text passage. In this example, the opposite “replace” or “replacement” would indicate a suitable text passage as well to grasp the relationship between the software and human police officers better. There is a possibility that, contrary to the theory section’s insights, the aim is to replace human work. So to avoid this bias, the opposite was considered as well.

3.4 Data collection

The data that is going to be used consists of official policing reports by the German ministry of inner affairs and its equivalent at federal state level. Currently six German federal states, namely Bavaria, Baden-Württemberg, North-Rhine Westphalia, Berlin, Hessen, and Lower Saxony, employ five different Predictive Policing software. These will be the focus of the research therefore and their state offices of criminal investigation, which are subordinate to the Federal Ministries of Interior Affairs, are the source for the documents needed for the analysis. On their official websites, policing reports will be searched for. Reports and documents available on the websites can be downloaded for free. Because the method of Predictive Policing is used in Germany since 2015, data sources will only be available from this year to the current year. Most of the documents are from the period between 2015 and 2018, because this is the period of time where the federal states conducted their pilot projects on Predictive Policing. Recent documents, meaning from this or the last year cannot be found on the official websites. Besides the policing reports concerning the pilot programs, press releases from the same websites will be examined as well to get a clear picture of how Predictive Policing is portrayed by the state offices for criminal investigation. The reason for doing so is that there are few official documents and even less policy documents on the topic of Predictive Policing, therefore, another form of communication via press statements released on the websites are taken into account as well. These are informative articles that mostly explain the concept of Predictive Policing. North-Rhine Westphalia’s state office for criminal investigation has even published videos in which Predictive Policing and its uses are explained and which are targeted at the public. These videos were transcribed via the transcript function in Microsoft Word to make a textual analysis easier. It has to be mentioned here that all sources are in German. Therefore, the analysis in atlas.ti is conducted in German as well, which means the English codings are applied to the German documents. These are translated back to English for the written part of the analysis in this thesis.

In order to select the appropriate documents, criteria were first established. The documents will be evaluated based on the following criteria. First, the documents need to be related to the topic of Predictive Policing, since this is researched in this thesis. The practices and functions of Predictive Policing need to be thematised in the documents and articles. Second, to encompass as many relevant documents as possible, policing reports and press releases at state as well as at federal level were included to achieve the highest coverage of the Predictive Policing debate in state or state-related organisations. Police stations on a local level are not specifically included since the websites of local police departments are all linked to those at federal state level. Therefore, it is sufficient to only consult the official websites of the state offices for criminal investigations.

3.5 Concluding remarks

Concluding this section, the most prevalent features of the following analysis will be quickly summarised. First, the analysis is going to be a discourse analysis that aims to discover the ways in which the meanings attributed to Predictive Policing, its various uses, its contributions to regular police work, and lastly the prospects for the work with Predictive Policing are presented and discussed in the selected documents. The documents that are going to be analysed were taken from the official websites of the state criminal investigation offices and the websites of the ministries for inner affairs. They consist of project reports, policy documents, and press releases. The next chapter will take a closer look at these documents and analyse them according to the provided coding scheme.

4. Analysis

The analysis chapter aims at investigating the four sub-questions one by one in order to sufficiently answer them at the end of this chapter. It wants to illustrate to what extent the discussion in the analysed documents conforms to the characteristics and expectations that scientists have pointed out in their articles. Starting with the first sub-question, the meanings attributed to Predictive Policing, the observations made will be presented. These observations are based on the application of the in the previous chapter presented codes to the documents. Since the chosen method is a discourse analysis, the particular wording will be highlighted together with the meaning that can be inferred in the choice of words. These steps will be repeated for the other three sub-questions as well.

4.1 The meanings of Predictive Policing

Starting the analysis, the definitions of Predictive Policing present in the reports, statements, and policy documents were examined in order to find a recurring pattern in the used characteristics.

The meanings attributed to Predictive Policing are widely agreed upon in the analysed documents. The aspect of *Crime Prevention* can be found in every description of the concept. As an example, a press release of the LKA Hessen links their Predictive Policing software explicitly to the term prevention (Hessisches Ministerium des Innern und für Sport, 2021). The house of representatives in Berlin defines the goal of Predictive Policing as *preventing* home burglary delicts from happening through an increased police presence in higher-risk areas (Abgeordnetenhaus Berlin, 2017). Berlin's House of Representatives also points out that Predictive Policing is a preventive measure and is not primarily aimed at increasing the number of solved cases (Abgeordnetenhaus Berlin, 2017). The state criminal investigation office of North-Rhine Westphalia attributes the term prevention to the concept of Predictive Policing as well (LKA NRW, 2022). The prediction of areas that are more likely to experience crime leads to preventive measures taken up by the police (ibid.). This recurring choice of words, regardless of document type, emphasise the potential that Predictive Policing holds. Preventing a crime from even happening would strongly add to the public's sense of security and by laying the focus on this characteristic of Predictive Policing, an indirect promise is given to the public that with the use of the software a safer future can be envisioned.

The Bavarian state criminal investigation office defines Predictive Policing as an analysis of data to prevent future crimes (BLKA, 2015). They do not only include the aspect of crime prevention into their definition but add the key characteristic of a data-driven analysis to it. "Data-driven" as a characteristic of Predictive Policing is one of the codes that was derived from scientific literature in the previous chapters. As seen in the theory chapter of this thesis, Predictive Policing is always linked to its algorithmic function and its dependency on data to calculate the results. And the keyword *data* is inherent to the concept of Predictive Policing which is highlighted in the definitions provided in the analysed documents. To illustrate this point further, a few examples will be given.

The SKALA project report in North-Rhine Westphalia provides a definition for Predictive Policing in which *data* is more specified. The software uses geo-spatial and temporal data for its prediction (LKA, NRW, 2019). Although this is still a very broad definition, it is more detailed than other definitions which only include the information that Predictive Policing is based on data sources (BLKA, 2015). However, this dissimilarity in detail may be due to the two different document types sourcing the definitions.

Moreover, while describing how Predictive Policing works, reports and press releases mention risk assessment. Risk assessment means that the software computes results, which are based on data that is provided to the algorithm, come in the form of identifications of areas that are at a high risk of experiencing crimes. This is linked to the concept of Near Repeat-Victimisation in the final report of the PreMAP project in Lower Saxony (LKA Niedersachsen, 2018, p. 6). There it is acknowledged that after a crime happens in a certain area, the risk for another follow-up crime near that place is increased. The prediction of that area is the task of a Predictive Policing software. Other documents mention this connection to the meaning of Predictive Policing as well. The LKA North-Rhine Westphalia describes Predictive Policing as a tool to predict the probability of hotspot emergence in certain areas based on complex computations (LKA NRW, 2019). Not only is the meaning of Predictive Policing connected to the risk assessment of certain areas, but the dependency on data and software is shown. This illustrates again, how intersected the meaning of Predictive Policing is with data-based analyses.

It is interesting to see that especially press releases use the narrative of “fighting” crime. Combatting or fighting crime, in German “Verbrechensbekämpfung” adds to the narrative of an actively pursued criminal whereas taking action against crimes is a more neutral wording. This wording can be found in press releases such as one by the interior ministry of Baden-Württemberg or documents released by the Bavarian state criminal investigation office (Ministerium für Inneres, Digitalisierung und Migration Baden-Württemberg, 2015; BLKA, 2015). This narrative highlights the police as a helper that fights criminals in order to increase the safety of innocent citizens. Naturally, the police portrays itself in the most positive way possible. Another text passage that calls attention to itself due to its choice of words is the following. The police in Baden-Württemberg released an informational post on their website that using the software “precobs” aims at an even better reaction to crime hotspots (Baden-Württemberg, 2015), meaning that their current police work without software support is already good. As a law enforcement agency, the police exists to keep Germany’s civilians safe, so naturally the wording in their press release paints them in a favourable light. Since press releases are addressed to the general public, the police depicts itself as a well-functioning organisation that works efficiently to which new technology only adds.

4.2 The applications of Predictive Policing

The most prominent application of Predictive Policing that is discussed in the analysed documents is the use of the software to adapt police patrols according to the calculation results and thus plan more strategically. The software predicts in which area a home burglary is at an increased risk of taking place. The police officers are able to seek this area out and engage in consultations with local residents (LKA NRW, 2022). The police presence in general can be increased in these residential quarters to deter potential criminals from committing the crime. The results of the software's analyses are planned to be distributed to police patrols via tablets in the near future (LKA NRW, 2021). The reason given for this plan is a more efficient distribution of information so that patrols are able to access the necessary information instantly. Hessen's LKA states on their website in a press release that the presence of police officers in public strengthens the sense of security (Hessisches Ministerium des Innern und für Sport, 2021). As an organisation that was assigned the protection of the public, the police present itself as a public servant whose goal it is to build a trusting relationship with citizens. Without the support of society, the police, and any other political institution loses its legitimacy. Therefore, by applying the word "strengthen" in this context and proclaiming the security of the citizens of utmost importance, the police appeal to this ideal of the public servant.

As a project initiated by the state criminal investigation office the SKALA project in North-Rhine Westphalia aims at achieving a well-coordinated cooperation with the local police departments which implement the Predictive Policing software. Namely, one of the described goals is to ensure a successful transfer of data to the police stations which will then be added on to with local data by those police stations (LKA NRW, 2021). This means the local police departments need to work with the data they have been given while also keeping the database updated. This is a condition for the data analysis to work as well as possible. Data analysis, as one of the codes for this section, is one of the applications connected to Predictive Policing. Data analysis as such is discussed with the precippice of necessity, that without data analysis no Predictive Policing is possible. For the data analysis to work, the software needs to be continuously updated with recent data (LKA NRW, 2021). Approaches to data analysis of the various implemented software in Germany differ between each other. By highlighting that experts are the ones operating the software and thus conducting the data analysis, it is shown that police officials are in control and that no decision is made based only on the results of the algorithm's predictions. This expresses the continuous power that the police holds which can not be deterred by the software's introduction.

4.3 The contributions to regular police work

The third sub-question guides this section of the analysis. The three developed codes "resource efficiency", "reduction of crime rates", and "complementarity" were derived to analyse this question regarding the alleged contributions of Predictive Policing to regular police work. Before going into more depth, it can be said that this part was well-discussed in various documents.

The final report for the PreMAP project in Lower-Saxony highlights right in the introduction chapter that the aim of Predictive Policing is not to replace regular police work, but rather to assist it in a complementary way (LKA Niedersachsen, 2018, p. 3). The continuous use of the word “support” while portraying the relationship between Predictive Policing and police officers shows that Predictive Policing is not viewed as a replacement. Another example for this can be found in an official statement of the house of representatives in Berlin. They answered a minor inquiry from a representative regarding the Predictive Policing software with stating that the prognostic software used in Berlin is an addition to regular police work (Abgeordnetenhaus Berlin, 2019). The software is not only called an addition, but a positive one as well. By using this particular wording, the application of Predictive Policing is framed as something good and helpful and desirable.

This aligns with the literature findings presented in the theory chapter of this thesis. Similar formulations can be found in the videos provided by the LKA NRW. It is expressed that the software SKALA adds to regular police work by constantly updating the level of knowledge of police officers (LKA NRW, o.D.a). The videos advertise SKALA as being able to improve the efficiency and quality of police work (LKA NRW, o.D.a).

A press release’s contents of the ministry of inner affairs in Baden-Württemberg correspond to this view. In their description of the Predictive Policing concept, they include this complementary working (Ministerium für Inneres, Digitalisierung und Migration Baden-Württemberg, 2015). Based on the software’s predictions and calculations, police officers take action, adapt their work and therefore react accordingly. By portraying the cooperation between software and humans as a reaction-based setting, they clearly differentiate between these two forms while also highlighting the need for human intervention. Regular police work is still conducted by humans and not replaced by the data-driven software.

The Bavarian LKA highlights the importance of controlling the results as well. They clearly state that it is a human police officer that decides to carry out the measures based on the software’s results and that the computer will not take over police work (BLKA, 2015).

Another contribution to the current form of police work discussed in the analysed documents is if Predictive Policing is able to reduce the crime rate. Since Predictive Policing is only used in the field of home burglary in Germany, the goal of reducing the crime rate is also targeted at this area in the reports. The educational videos on the website of the LKA NRW discuss how effective the measures that come with Predictive Policing are and if they can be measured with variables such as less home invasions or more arrests. It is answered by illustrating the limitations of measurements. It is nearly impossible to measure something that did not happen in the first place (LKA NRW, o.D.a), since the goal of preventive police work is that no crimes are taking place. The final report on the project in North-Rhine Westphalia mentions this as well. Based on a scholar’s statement, the report reminds its readers to not overestimate the abilities of a Predictive Policing software. There are limits to it and it is not possible to prove a causal relationship between the use of Predictive Policing-software and a

decline in crime rates (LKA NRW, 2019, p. 1). By including the limitations it is ensured that Predictive Policing is not viewed as the perfect solution to home burglary incidents and keeps the expectations of the reader at bay.

It has to be mentioned that every state registers consistent lower crime rates in the area of home burglary since 2016 (Bundeskriminalamt, n.D.). However, the institutions agree on the fact that it cannot be traced back to the use of Predictive Policing solely, but rather to a combination of different implemented measures (Hessisches Ministerium des Innern und für Sport, n.d.; LKA Niedersachsen, 2018).

“Efficiency” is also a word that is used throughout the analysed documents. In the final report on SKALA, the North-Rhine Westphalian software, it is mentioned that the use of the software assists in promoting a more resource efficient way of working (LKA NRW, 2019).

In terms of investigating the efficiency of Predictive Policing, it is quite interesting to examine how Bavaria handled the work with the software. While being the first German state to introduce the software PRECOBS in police work in 2015 (Knobloch, 2018), a press release from October 2021 states that the software operation was discontinued (LKA Bayern, 2021). This was due to a declining number of cases in home burglary, which is why the software was not able to calculate accurate results anymore. Therefore, the state criminal investigation office decided to end the PRECOBS operation. The software could not guarantee an increased efficiency in police work anymore. The BLKA, however, does not rule out the possibility of working with a Predictive Policing software in the future, as it is stated that they will observe future developments in that area. This case is interesting to observe, since it shows how important efficiency is to police work. As soon as the software was not assisting the way it used to do in the past, it was discarded. This decision seems to be economically guided. The BLKA even stated that they did a cost-benefit analysis prior to discarding the software (LKA Bayern, 2021) that led to discarding the tool.

4.4 The future of Predictive Policing

Ethical concerns, especially transparency and accountability, were raised among the scientific literature on the topic. With high standards for data protection in place in Germany, these two factors need to be addressed sufficiently by official institutions. The LKA North-Rhine Westphalia states that no person-related data is collected or used in their software. Moreover, the use of the Predictive Policing software is overlooked by the data protection officer of the state (LKA NRW, 2022). The importance of data transparency and accountability is therefore acknowledged and thematised in the analysed documents regarding the state of North-Rhine Westphalia. During the SKALA project, the state criminal investigation office worked on informing their employees of the project to increase internal acceptance within the organisation. At the end of the report, it is noted that this educational campaign was highly appreciated and necessary (LKA NRW, 2019). Additionally, this education needs to be extended to further internal and external information provision in the future to increase the transparency of Predictive Policing guided police work (ibid.). The need for a discussion of data

protection in algorithm-driven software is also acknowledged in the final report on the Predictive Policing project in Baden-Württemberg. These, however, are not discussed in the report (Gerstner, 2017). In response to a question from a member of parliament in Berlin, a representative of the state government confirms that no person-related data is used in their software for Predictive Policing (Abgeordnetenhaus Berlin, 2019). The representative argues that this however is due to technological factors which are inherent to the software and not due to ethical or legal reasons. Nonetheless, by mentioning that ethical and legal reasons were not considered, it is indirectly shown that the state government of Berlin is at least aware of issues surrounding data protection when using a person-related approach to Predictive Policing.

The SKALA final report discusses how the prognostic software can be extended to other areas of use besides home burglary. It comes to the conclusion that similar software can be applied to vehicle related crimes (LKA NRW, 2019). However, it is noted that more research has to be done in the future to explore the possibilities with software-based predictions in this area. Furthermore, the tested software in the SKALA project is only trained with socio-structural data, so technological improvements would be necessary to apply the software to other crimes (LKA NRW, 2019, p. 77). These improvements consist of collecting and implementing data related to the crimes and an adaption of the computational model underlying the software.

Berlin's government considers expanding the application of their Predictive Policing software to other areas as well by stating that they are currently testing the expansion (Abgeordnetenhaus Berlin, 2019). This information is provided in a different context however and it is only mentioned in one sentence rather than in a broader elaboration on how the testing is performed, which results are already registered, and to which areas exactly an expansion is planned. The government's representative assures a fellow member of parliament that no person-related data is used in their Predictive Policing software and will not be used in other currently considered areas of application (Abgeordnetenhaus Berlin, 2019). This short information can either infer that there are no relevant results to be registered yet, or that the project on expanding the scope of the software is still in a beginning phase where no preliminary contents may be published. The lack of elaboration on the topic however may as well be due to the nature of the document which is a response to a minor inquiry in Berlin's house of representatives. The document type aims at shortly answering the previous posed questions by a member of the house of representatives. The original question in the document does not inquire after the expansion but rather the usage of person-related data in the future. Therefore, a lack of elaboration on the topic of future expansions can be justified by a lack of relevance in the final answer.

Another aspect mentioned in the report is that the computational model was only used in urban environment. It is therefore encouraged to research the use of Predictive Policing in more rural regions. This requires an adaption of the software to the prevailing socio-structural data in these rural areas. It was also noted that the hardware could be updated to enhance the computing power and thus the speed of calculations (LKA NRW, 2019, p. 84). In general, police officials acknowledge the need

for further technological improvement. The state office for criminal investigation in North-Rhine Westphalia states that tests for automating data analyses are already being conducted which means that NRW law enforcement is taking the next steps in actively adapting and evolving their software.

Although the Bavarian police has stopped using their Predictive Policing software, the BLKA recognises Predictive Policing as a valuable addition to regular police work which links back to the previous chapter regarding the third sub-question. The BLKA states in a press release that they will continue to monitor the developments of strategic and innovative methods in the future to assist Bavarian police departments in fighting crime (BLKA, 2021). This demonstrates the willingness of the Bavarian police to continue working with methods such as Predictive Policing as soon as there are new developments in technology that make it a worthwhile tool again.

Another interesting point to mention here is that during the evaluation phase of the pilot project in Baden-Württemberg, employees were asked to fill out a survey regarding the use of Predictive Policing. The main question asked in the survey was if employees would like to see the Predictive Policing software implemented after the pilot project phase ends. Surprisingly, the answers given were very distinct. Almost 60 % of respondents in the Stuttgart police department disagreed or partly disagreed with the survey item, stating that they do not want Predictive Policing to become a part of their future workday (Gerstner, 2017). These stances differ between the various departments within a police station. The project report also mentions that the more contact the employees have had with the PRECOBS alarm, the more likely they are to reject its future use. Nevertheless, the project report reminds readers to not overestimate this result since the evaluation phase only lasted for a span of six months. The project report was written by a researcher from the Max-Planck Institute for Foreign and International Criminal Law and therefore aims at upholding scientific principles for writing which can be seen in the structure and contents of the document. The author evaluates the existing data and places them in statistical context while noting the limitations of the results. While including statistical results which caters more to a scientific audience, the aim of this project report should be to inform the respective officials in politics and high-ranking officials in the police of the results in order for them to make policy decisions.

4.5 Concluding remarks

After examining the four sub-questions in the previous part, it is now time to answer them properly. The first question “What are the meanings attributed to Predictive Policing?” was analysed by looking into the definitions found in the analysed documents. The key characteristics that were expected to be found, namely that Predictive Policing is based on computations of data, its most prominent goal is to prevent crimes, and that at-risk areas are predicted, could indeed be recognised within the analysed data. In summary, the meanings attributed to Predictive Policing are that it is an algorithmic tool that enables the police to ideally prevent crimes from happening before they even emerge. Nevertheless, the analysed documents highlight the limits of this crime prevention. Especially the project reports present a realistic assessment on this aspect. It is empirically hard to measure how effective preventive

measures are, since a crime that did not take place cannot be registered and a clear causal relationship between the decrease of crime rates and the use of Predictive Policing cannot be established. Press releases regarding this matter paint Predictive Policing in a more ideal light, without directly mentioning its limitations. Therefore, the meaning attributed to Predictive Policing in those documents is rather a possible solution for crime prevention.

The second question “What are the envisioned uses of Predictive Policing?” examines which applications of the tool can be found in the analysed documents. One of these applications is the adaption of police patrols. The North-Rhine Westphalian project reports declared it as one of the goals of the project. Increased police presence in hotspot areas as a result of working with Predictive Policing is used as a narrative in other documents to emphasise the police’s security role in public. Another envisioned use of Predictive Policing is the complex data analysis that serves as the core of the tool’s function. The software is operated by special experts who control the output of the computations and decide whether or not practical interventions will be made.

Third, the answer for the question “What are the alleged contributions to regular police work?” corresponds with the expectations that were formulated based on the theory section. Throughout the different documents the aspect of efficiency was prevalent. As one of the key arguments for the use of Predictive Policing, efficiency, specifically resource efficiency, is connected to the illustrated image of Predictive Policing. Police patrols can be directed to the areas at risk of experiencing crime more quickly. But limitations are thematised as well. Predictive Policing is not the overall solution for crime prevention, and if police officers and employees are not included or not informed well enough in the process of implementing the tool, resource efficiency cannot be achieved.

Lastly, the fourth question “Which prospects for the uses of Predictive Policing are discussed in the examined documents?” has provided some new insights that add to the expected results from the theory section. While scientific literature considers an organisational reform as necessary for Predictive Policing to work out and additionally raises concerns regarding accountability and transparency for the data that is used, the analysed documents focus rather strongly on expansion opportunities for the software so that it can be used in other areas of crime as well. Data protection is implicitly a focus of discussion as well, especially in discussions in parliament. Written inquiries made by the opposition all asked if person-related data was used which would go against data protection law in Germany. The analysed project reports all highlighted their abstinence from person-related data in Predictive Policing as well. Organisational reform is addressed in a way that educational campaigns are acknowledged and appreciated by employees. Larger reforms are not addressed in the documents. Technology is another aspect that needs some improvement in the future according to project reports. Server capacity and data analysis processes need to be further optimised to increase efficiency and user friendliness.

The language in the examined policing reports was quite neutral, including both advantages and disadvantages of Predictive Policing, since the goal of these reports is to inform the readers of the

progress made in the project and to present the results and evaluation produced by them. The concept of Predictive Policing was not overly praised, but rather its limitations and issues were raised. It was also made clear that Predictive Policing should not be overestimated in its capabilities in preventing crime from happening.

5. Conclusion

After having conducted the analysis based on the four sub-questions, it is now time to return to the main research question “*In what ways is Predictive Policing discussed in German policing reports?*” and to provide an answer.

Predictive Policing is a concept that is viewed as an opportunity to prevent crimes from being committed. In every given definition, the keyword *crime prevention* is highlighted. Although predominantly stating the advantages of Predictive Policing, the discussion of limitations is not neglected. Moreover, it is emphasised that the use of AI does not replace human officers. As one of the most discussed aspects, one can infer that the police wants to ensure that they are viewed as the controlling part and want to quell the public’s concerns for a dystopian-like future in which computers make all decisions. In short, Predictive Policing supports already existing police work and enhances their effectiveness when applied correctly.

The scope of content found for each sub-question widely differed as well. While definitions were found in every document, applications were not as often addressed, at least not in detail besides mentioning the implementation of complex data analysis and the following deployment of police patrols.

Observations were made regarding the choice of words in documents which depend on its type. First of all, it can be said that the scope of content varies depending on the document type. While responses to minor inquiries and press releases are naturally kept short, project reports dive deeper into the topic and therefore offer more variety of information. Second of all, press releases tend to paint Predictive Policing in a better light than project reports do. This can be traced back to the different functions of these document types. The project reports that summarise the test phases of Predictive Policing pilot projects are written and structured in a scientific manner. Press releases are short and informative articles that are addressed to the wider public in order to keep them updated with recent developments. Especially in security discourse, more specifically the area of home burglary, communication with citizens is essential to sensitise and educate them. Press releases therefore aim at this while promoting the use. Moreover, Predictive Policing is already being used in police work nowadays, so press releases tend to promote the concept in order to justify the use.

The findings of this thesis are in accordance with the theoretical insights established after an in-depth review of scientific literature. This paper adds to the existing research in the field of AI in law enforcement by providing an overview of the current state of Predictive Policing in Germany while

also considering the effects the chosen wording has on its readers and putting the choice of words in relation to the document type.

Practical implications that can be derived from this thesis should address policy makers and police officials alike. Although Predictive Policing has a lot of facets to be discussed, there is a lack of publicly accessible information on the topic. The peak of published content was during the pilot projects' test phases where evaluation reports were released to the public. Especially in the context of data protection and in the light of Germany's constitutional court's ruling, more transparency in current developments regarding Predictive Policing is much needed. North-Rhine Westphalia's LKA has already worked on this issue and provides an informative and easily accessible website including short videos for Predictive Policing where the software and how it works is described. The other states that have implemented Predictive Policing software should therefore follow this example and create something similar to inform their citizens of the tool.

The limitations of a discourse analysis lie in its subjectivity. Although the analysis is guided by codes to operationalise the concept those codes are still subjected to the researcher's own understanding and interpretation of these. Moreover, the amount of data collected is heavily restricted as there simply is not as much publicly accessible data. So for the next research, it would be recommended to increase the amount of data to analyse to make the research design more robust.

Further research on this topic could examine the difference of how media and the public's discourse is shaped in comparison to the police officials' discourse which was investigated in this thesis. Moreover, Predictive Policing is a tool that can be expanded to other areas of crime investigation, as already proposed, and investigated by the police office in North-Rhine Westphalia. If these prospects become reality, further research can focus on examining how the concept of Predictive Policing is used in these new areas of application and how they take shape in discourse. Lastly, a suggestion for research based on this thesis is an investigation that takes court rulings and laws into account. The constitutional court in Germany has already declared two legal paragraphs which authorise the use of Predictive Policing software in Hamburg's and Hessen's police forces as unconstitutional (Bundesverfassungsgericht, 2023). Therefore, it would be an interesting and relevant research topic to examine future developments in this area. It could include research on how the states adjust their software to the constitutional court's verdict and what effect AI based technology in state institutions has on German law.

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Data Appendix

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Note: Here you can find three informational videos I used as a data source for my analysis

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