

POLICE ASSESSMENTS:

The identification of vulnerable
victims during crime reports



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Chapter 1

General introduction

INTRODUCTION

In 2015 and 2018, two cases in which the police failed to adequately protect victims of violent crimes drew extensive public attention in the Netherlands. Despite occurring independently, they revealed a similar problem. In both cases, a woman reported a crime to the police involving an ex-partner with a substantial criminal record, who was either stalking or threatening them. The women were frightened, felt unsafe and turned to the police in the hope of receiving protection. Although the police and other agencies involved classified the incidents as stalking, the victims' protection needs were not properly assessed, which left the victims open to further harm – in both cases with fatal consequences (Commissie Eindhoven, 2016; Inspectie Justitie en Veiligheid, 2019).

The two cases underscore the fundamental role of the police in assessing victims' protection needs at the moment they report a crime. After experiencing victimization, the police are often the first point of contact for victims in their pursuit for justice, safety and assistance. Consequently, police officers act as gatekeepers for both the criminal justice system and broader protection services (Bartkowiak-Théron & Asquith, 2012). Therefore, their assessment of protection needs strongly determines the activation of protection measures which may reduce the risk of further harm. Performing these assessments in daily police practice, however, is a complex task as officers must balance two roles: a judicial role focussed on investigation and prosecution, and a victim support role aimed at identifying safety concerns and protection needs (Saxton et al., 2020). Consider, for instance, the following situation. A victim arrives at the police station to report repeated abuse by their partner. The officer welcomes the victim into a private interview room and begins by listening carefully to their story, looking for signals relevant for both roles. In the judicial role, the officer asks specific questions about the dates, nature and frequency of the incidents, thereby seeking evidence that would support further investigation and, eventually, possible prosecution (Johansen et al., 2022). Simultaneously, in the victim support role, the officer needs to identify ongoing risks endangering the victim's safety. For this purpose, the officer looks for signs that may call for initiating protection measures (Rumney & Mcphee, 2023). Traditionally, police work centers on the judicial role, while the victim-support role has only been added in recent years. A major driver of the latter development was the EU Victims' Directive (2012/29/EU), particularly Article 22 of the Directive, which requires institutions that come into contact with victims

to conduct a timely Individual Assessment of their vulnerability and protection needs.¹

Fulfilling both roles effectively within the constraints of a limited timeframe is highly complex and challenges the ways in which officers define their professional identity (Saxton et al., 2020). Officers may particularly struggle to interpret and carry out the victim-support role, not only because it is relatively new but also because it requires a different set of tools and skills. Therefore, lawmakers, policymakers and researchers have searched for ways to support officers in this role of identifying victims in need of protection.

Over the past decade, the term *vulnerability* has become an important criterion which helps officers to determine whether a victim needs additional protection (Brown, 2014; Menichelli, 2019). Following the Victim's Directive, EU member states were free to decide which institutions would be tasked with conducting the Individual Assessment and many assigned first responsibility to the police (Ivankovic et al., 2019). In addition, risk assessment instruments that were already being used by police agencies, such as B-SAFER and ODARA, were applied in this context during initial victim-police encounters (Pavlou et al., 2019). The Directive has also promoted development of new risk assessment tools and improvement of existing instruments.

Tasking police officers with identifying vulnerability, however, has been criticised in several respects. First, there have been doubts whether regular police officers are adequately equipped to conduct vulnerability assessments (Groenhuijsen, 2014). Second, time constraints and the complexity of modern-day policing may limit officers' capacity to conduct the nuanced evaluations required for accurate identification (Ask, 2010). Third, several studies have criticized the narrow and inconsistent conceptualization of vulnerability in assessment instruments (Bartkowiak-Théron & Asquith, 2012; Van der Aa, 2016). Fourth, evaluation studies noted that police officers' practical use of these instruments is also problematic, as they may struggle to correctly identify relevant characteristics of vulnerability (Khan et al., 2015; Robinson & Howarth, 2012; Svalin et al., 2017; Turner et al., 2019). Limited or inconsistent understanding of vulnerability may lead to focusing on specific groups of victims while

¹ In 2012, the EU Victims' Directive (2012/29/EU) was accepted by the European Council and Commission, setting minimum standards for victims' rights, support and protection across EU member states.

overlooking others, and this may also result in inadequate provision of protection measures.

Since police officers play a gatekeeping role in initiating protection measures, issues that limit accurate identification of vulnerability may have serious implications for victims' safety. It is, therefore, essential to improve our understanding of how police officers identify vulnerability in daily practice and how they may more effectively assess a key aspect of vulnerability: the risk of repeat victimization. The aim of this dissertation is to contribute to a better understanding of these two aspects and thereby strives to provide relevant insights about the strengths and shortcomings of how police officers determine victim vulnerability. It examines current assessment practices from multiple perspectives, identifies possible improvements, and ultimately aims to improve identification of vulnerability and better protection of victims in need

Identifying vulnerability in a policing context

Using the concept of vulnerability as a lens to allocate (semi-) governmental resources, such as victim support or protection measures, fits within a wider development called the 'vulnerability *zeitgeist*' (Brown, 2014). This increased focus on vulnerability was already present in educational settings and social care policies (Brown, 2014; Brown et al., 2017; Ecclestone & Goodley, 2016), but in the past decades also emerged in the context of victimology and policing. Increased emphasis on vulnerability, however, comes with several challenges. While the term 'vulnerability' may sound clear and logical, in academic terms it is a complex and highly heterogeneous concept (Brown et al., 2017; Verza, 2022). In general, the concept is approached either from a universal or an 'enhanced' perspective. The universal approach views vulnerability as an inherent human condition, emphasizing that everyone is vulnerable and may, at times and in specific contexts, depend on government resources, social support or protection (Fineman, 2008). In other words, the concept is dynamic over the life-course, as individuals may be more vulnerable during certain life-stages, such as childhood (Brown et al., 2017). The 'enhanced' approach, on the other hand, views the term as a condition stemming from specific individual characteristics such as a young or old age and mental health problems, or contextual and situational aspects, such as unemployment, prior victimization, or living in disadvantaged neighbourhoods (Brown, 2012, 2014; Menichelli, 2019). Although this approach mainly associates vulnerability with static conditions, it is

important to underline that it may also stem from entering specific circumstances, environments, or situations. Nevertheless, specific groups of individuals can be identified as being more vulnerable and thus may need to be prioritised in terms of offering protection measures.

Police officers are expected to assess all victims who report a crime for signs of vulnerability, regardless of these two approaches. In other words, every victim could be eligible for protection measures. However, protocols and risk assessment instruments tend to emphasize particular aspects of vulnerability, thereby directing officers' attention towards specific groups of victims (Bartkowiak-Théron & Asquith, 2012; Menichelli, 2019). This focus may strongly influence their conclusions about vulnerability and decisions about offering protection measures.

Using the concept of vulnerability to base such decisions, however, has met with criticism, and several studies highlighted the significant challenges confronting police officers in the identification of vulnerability (Bartkowiak-Théron & Asquith, 2012; Brown, 2012; Keay & Kirby, 2017; Van der Aa, 2016). These challenges primarily concern how the heterogeneous nature of vulnerability is comprehended in assessments. Vulnerability after victimization can differ strongly in how it is understood, in terms of its meanings, and how it is recognized, i.e. its indicators. The first predominantly refer to the risk of repeat victimization and the impact or harm caused by the victimization-experience (Keay & Kirby, 2017; Walklate, 2011). Vulnerability indicators, however, can be distinguished into three main categories: victims' individual traits, characteristic of the victimization-incident, such as the type, nature and frequency of the crime, and the context in which the incident took place (Innes & Innes, 2013). Consequently, a broad range of victims may be identified as vulnerable. At the same time, vulnerability assessment tools and protocols focus on specific aspects of the concept. This raises concerns about potential blind spots, particularly the risk that certain types of victims may be systematically overlooked (e.g., Bartkowiak-Théron & Asquith, 2012; Van der Aa, 2016). For instance, when conducting vulnerability assessments, officers may only focus on easily observable aspects which allow them to identify victims in clear danger, and remain unaware of less obvious risks (e.g., Robinson & Howarth, 2012; Turner et al., 2019). Additionally, whether officers consider a victim to be vulnerable may strongly depend on their perceptions of how victims should behave. Studies show that officers are more likely to view victims who behave as

‘expected’ as more eligible for additional protection, whereas those who do not are more likely to be mistrusted (Ask, 2010; Sleath & Bull, 2017).

These concerns and problems underline the need for a deeper understanding of how vulnerability is identified in police practice. Previous studies also show the importance of refining vulnerability assessments to better ensure accurate identification. This dissertation directly addresses these two needs.

THIS DISSERTATION

Central research question

The current dissertation aims to advance academic and practical understanding of how vulnerability is assessed in everyday police practice, and to what extent vulnerability, in terms of the risk of repeat victimization, could be determined more effectively. It covers two crucial topics. On the one hand, this dissertation strives to provide a better understanding of which indicators police officers and vulnerability assessment instruments apply to identify vulnerability. Furthermore, it focusses on the extent to which vulnerable victims can be identified through assessment instruments as well as officers’ professional judgements. It thereby addresses both strengths and limitations of identifying the concept of vulnerability in a policing context. The central research question of this dissertation is as follows:

How and to what extent are vulnerable victims identified in daily police practice?

To answer the central research question, this dissertation adopts a multi-perspective approach, addressing different aspects of the identification of vulnerability:

- *Article 1* provides insights in police officers’ articulated thoughts on the identification of victim vulnerability and possible responses towards vulnerable victims, in terms of offering protection measures.
- *Article 2* examines to what extent a valid instrument to classify the risk of repeat victimization can be based on structured police registration data.

- *Article 3* builds on *Article 2* and examines to what extent a similar instrument to classify the risk of repeat victimization can be based on unstructured police registration data and a combination of both structured and unstructured data.
- *Article 4* analyses five key shortcomings of vulnerability assessment instruments and demonstrates how these contribute to the broader risk of under- and over-protection of victims.

AIMS OF THIS THESIS

Aim 1: Improving our understanding of how police officers identify victim vulnerability when a victim reports a crime

Accurate identification of vulnerability strongly depends on how police officers' use the information they receive when a victim reports a crime. Officers' decisions can determine which victims who are considered vulnerable receive protection, whereas inadequate judgements of vulnerability may leave victims unprotected. Two key factors inform officers' decision making: indicators included in assessment instruments and their professional judgments, views and thoughts. Vulnerability assessment instruments, such as the EU Directive's Individual Assessment and various risk assessment instruments, intend to support police officers with identifying victims they should offer protection measures. However, officers' own perceptions also affect how they respond to different types of victims and who they judge as being most in need of protection and how they respond to different types of victims. Both aspects therefore determine who is identified as vulnerable and who is not.

To optimize accurate assessment, it is crucial to develop a more comprehensive understanding on how police officers identify vulnerable victims in daily practice and on which information they base their professional judgments. Gaining deeper insight in this process may reveal the strengths and limitations of current approaches, specifically by clarifying which victims are adequately identified and which may be inadvertently overlooked. The first aim of this dissertation is to address this challenge by exploring the two main dimensions that determine the identification of vulnerable victims: the use of vulnerability assessment tools and police officers' professional judgements, views and thoughts during initial victim reports.

Aim 2: Evaluating tools that may assess the risk of repeat victimization more effectively

The quality and completeness of information on vulnerability police officers gather when interviewing victims is crucial for optimal identification. Existing assessment instruments usually rely on structured forms that list vulnerability indicators and are filled in manually by officers (e.g., CAADA, 2012; Kropp, 2004). The manual use, however, has raised concerns regarding the accuracy of these instruments (Kebbell, 2019). Studies demonstrated that officers often fill in the forms inconsistently and incompletely (Khan et al., 2015; Svalin et al., 2017). Consequently, such instruments have shown lower performance levels compared with other types of assessment instruments (van der Put et al., 2019). One potential solution may be the use of automated risk assessment instruments (Kebbell, 2019; Turner et al., 2019). However, these instruments rely on the crucial condition of demonstrating acceptable predictive validity.

The second aim of this dissertation is to develop and validate an instrument aimed at assessing an important aspect of vulnerability: the risk of repeat victimization. This instrument is called *ProVict*.² It is based on registered prior police contacts, which represent an important latent vulnerability indicator that officers may overlook when interviewing victims (Turner et al., 2019). Prior police contacts, either as a victim, suspect or witness, imply an elevated risk of repeat victimization (e.g., DeCamp et al., 2018; Farrell et al., 1995; Farrell & Pease, 1993; Grubb & Bouffard, 2015). Moreover, this information is registered in standard police information systems, making this type of data accessible and useful for both the development and validation of an automated risk assessment instrument (Brimicombe, 2018; Turner et al., 2019). Hence, this dissertation examines to what extent an automated risk assessment instrument focussed on prior police contacts, can correctly identify victims with an elevated risk of repeat victimization.

2 The development and validation of *ProVict* was part of a collaborative program between the Dutch National Police, Praktikon/Radboud University Nijmegen and Tilburg University.

RESEARCH DESIGN AND OVERVIEW

This dissertation adopts a multi-perspective approach, consisting of four scientific papers that offer specific perspectives on the identification of vulnerability in police practice. The first paper draws on qualitative data collected during a vignette study. The second and third papers address the use of structured and unstructured police registration data for the development and validation of several options for *ProVict*. The final paper comprises a critical reflection based on academic literature on the designs and use of vulnerability assessment instruments and police-victim interactions. The multi-perspective approach adopted here, offers nuanced insights into how vulnerability is identified, and thereby contributes to both academic debate and policy development and evaluation.

The first three papers focus on the Dutch police context. Since the introduction of the Individual Assessment in 2017, Dutch police officers are legally required to assess victims' vulnerability and protection needs in a timely manner. While the findings of the articles may particularly be pertinent to Dutch policing, they may also be relevant for other EU member states where police officers are tasked with the identification of victim vulnerability.

Outline of this thesis

The thesis is structured as follows. **Chapter 2** examines how police officers identify and respond to vulnerable victims. It addresses the professional judgements of officers without the aid of assessment instruments. Using the Articulated Thoughts in Simulated Situations (ATSS; Davison et al., 1983; Zanov & Davison, 2010) approach, it analyzes officers' reactions to two fictional scenarios involving a victim reporting a crime. This chapter provides insight into police officers' reasonings when assessing whether a victim is vulnerable and in need of protection.

Chapters 3 and 4 focus on the development and validation of *ProVict*, a risk assessment instrument aimed at helping police officers to identify victims with an elevated risk of repeat victimization. It uses structured data, e.g., crime classifications, victim/suspect/witness roles, and unstructured data, e.g., police notes and interview reports registered by uniformed police officers. While structured data has traditionally been considered crucial for developing risk assessment instruments, research increasingly highlights the value of unstructured data and a combination

of both data types (Hassani et al., 2016; Hatef et al., 2020; Van der Put et al., 2019). Chapter 3 focusses on the instruments developed and validated with structured data, while chapter 4 examines the added value of using unstructured data, as well as the combination of both types of data.

Chapter 5 critically reviews existing vulnerability assessment instruments used in police practice, such as the Individual Assessment and various risk assessment instruments. It identifies five key shortcomings that relate to both instrument design and how police officers apply these tools in practice. Drawing on empirical studies on vulnerability assessment and police-victim interactions as well as theoretical literature on vulnerability, the chapter highlights how these issues contribute to the risks of both under- and over-protection, which can be considered a broader problem underlying vulnerability assessments and, eventually, the protection of victims in need.

Chapter 6 synthesizes the overall findings of this dissertation, reflecting on our understanding of how police officers identify vulnerable victims and evaluating the role of vulnerability assessment instruments used in support of this process.

Chapter 2

Police officers' professional judgments on victim vulnerability

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ABSTRACT

This study addresses police officers' identification of vulnerable victims and responses to these victims. Using an Articulated Thoughts in Simulated Situations (ATSS) approach, police officers ($n = 51$) responded to two scenarios regarding a victim who reported either a property crime or a stalking incident. After hearing each scenario, participants judged whether the victim was vulnerable or not and discussed which they would propose any protection measures. Findings showed that a majority of the participants identified the victim as vulnerable. Participants mainly based their judgements on indicators related to the incident or its consequences. Regardless of their judgement, participants proposed a variety of protection measures. Both this finding and the majority of vulnerability judgements suggest that police officers may act out of the principle of 'better safe than sorry'.

INTRODUCTION

The EU Victims' Directive (2012/29/EU) requires EU member states to perform an individual assessment to identify whether a victim is vulnerable and, therefore, in need of protection measures. Ultimately, the goal of the individual assessment is to identify the victims who are most in need of protection. In most member states, the police are tasked with performing these assessments. Despite the growing attention to victims' vulnerability in the area of policing (Manikis, 2019; Menichelli, 2019), there is a lack of conceptual clarity and robust systems for the identification of vulnerability (Enang et al., 2019; Skidmore et al., 2020). Vulnerability is a complex and highly heterogeneous concept with different meanings (Brown et al., 2017). With regard to victimisation by crime, the most prominent meanings relate to the (future) risk of (re) victimisation and the impact or harm of the experience of victimisation (Keay & Kirby, 2017; Skidmore et al., 2020; Walklate, 2011). Whether a crime victim is vulnerable depends on a variety of factors that may be used to identify the vulnerability. These indicators could be related to the victims' individual characteristics, the specific incident or the context in which the victimisation takes place (Innes & Innes, 2013). In practice, police officers often use these indicators to assess whether a crime has a high impact on a victim or as is the case with the individual assessment, elevates the risk of re-victimisation.

The complexity of vulnerability poses a significant challenge to police practitioners in correctly distinguishing highly vulnerable victims from less vulnerable victims and subsequently adequately assigning protective measures. The lack of conceptual clarity and robust identification instruments trigger risks of over- or under-protection. On the one hand, too few victims are correctly identified, resulting in increased harm due to high impact or re-victimisation as these victims do not receive the protection measures they need (Aihio et al., 2017; Enang et al., 2019; Franklin et al., 2020), or too many victims receive protective measures, resulting in a waste of resources and possible negative side-effects, such as stigmatisation and patronisation (Peroni & Timmer, 2013; Walklate, 2011).

In light of these concerns, this study aims to analyse Dutch police officers' understanding of victim vulnerability as well as their proposed responses in terms of protection measures. We use an Articulated Thoughts in Simulated Situations approach (ATSS; Davison et al., 1983; Zanov &

Davison, 2010) to study police officers' reactions towards two scenarios in which a victim reports either a property crime or stalking incident. Each scenario includes four indicators that are often associated with victim vulnerability in academic literature: risky lifestyles (Pratt & Turanovic, 2016), the type of crime (Innes & Innes, 2013), victims' responses to the crime in terms of fear and resilience (Maglione, 2017; Walklate, 2011) and prior police contacts as victim/witness or suspect (e.g. Clay-Warner et al., 2016; DeCamp et al., 2018; Grubb & Bouffard, 2015). In this context, fear may indicate vulnerability due to higher perceived negative impact and lower self-efficacy, while resilience may point to low vulnerability and a higher susceptibility to self-regulated actions in overcoming the victimisation incident (Maglione, 2017; Walklate, 2011). By asking police officers to explain whether or not the victim in the scenarios was vulnerable, this study aimed to determine which indicators police officers use in the identification of vulnerability. Furthermore, this study strived to provide insight into which protection measures police officers would propose after their identification of vulnerability.

Identifying victim vulnerability

Several theories have been developed as to what constitutes a vulnerable person (Verza, 2022). While some suggest that every individual is vulnerable (Fineman, 2008; Verza, 2022), others argue that vulnerability may refer to specific individuals or groups, based on certain characteristics (Enang et al., 2019; Peroni & Timmer, 2013; Skidmore et al., 2020; Van der Aa, 2016; Verza, 2022). The latter approach applies to vulnerability assessments in which governmental institutions, such as the police, are tasked with identifying vulnerable individuals in need of support or protection (Menichelli, 2019). Eventually, these assessments aim to prevent repeat victimisation or secondary victimisation and also contribute to a better allocation of limited resources.

Vulnerability assessments, however, are challenged by a lack of robust systems to identify vulnerable victims and confusion amongst police officers about what vulnerability means (Enang et al., 2019; Keay & Kirby, 2017; Skidmore et al., 2020). Limited understanding of vulnerability may result in incomplete judgements and a risk of over- or under-protection (Gilson, 2016; Van der Aa, 2016). It is, therefore, important to improve our understanding of how police officers identify vulnerability. Previous studies analysed survey data, criminal records or vignettes of victimisation incidents. These studies demonstrated that police officers mainly based their assessments on indicators closely related to the

victimisation incident, such as the threat of a weapon, injuries or the presence of children on the crime scene (Petersson & Thunberg, 2021; Robinson et al., 2016, 2018; Turner et al., 2019). Yet, studies also showed that police officers based vulnerability assessments on characteristics of the victim, such as risky behaviour, age and mental health problems (Bach et al., 2021; Enang et al., 2021). While these studies provide some insights into how police officers understand victim vulnerability, the reasoning behind these identifications remains largely unclear.

Providing protection measures

Victims in need of support often refer to safety, protection from the suspect and support from the criminal justice system (Henning, 2016; Ten Boom & Kuijpers, 2012; Villacampa & Salat, 2019). Vulnerability assessments serve as an instrument for police officers to identify such needs, formulate protection measures and thereby help to better protect them against future harm (Enang et al., 2021). The police may initiate protection measures, such as temporary restraining orders or extra alerts on high-risk victims in the police systems. Vulnerable victims may also be referred to victim support services, health professionals or multi-agency safeguarding hubs, which can also initiate support measures (Enang et al., 2021; Robbins et al., 2014; Shorrock et al., 2019;). Measures initiated by police agencies or by multi-agency safeguarding hubs are often part of risk management strategies (Storey et al., 2014). In practice, these strategies are indeed offered more often to victims at risk of repeat victimisation (Belfrage et al., 2012; Storey et al., 2014). However, police officers may still be unaware of specific indicators of vulnerability when they are developing risk management strategies (Storey & Strand, 2017).

To better understand how police officers understand vulnerability and protect vulnerable victims, the current study addresses both steps of vulnerability assessments: the identification of vulnerability and the protection measures suggested for vulnerable victims. While previous studies address both steps, they rarely combine them and address police officers' reasoning behind decisions in both steps. The current study, therefore, expands prior literature by using an ATSS approach to analyse Dutch police officers' understanding of victim vulnerability as well as their proposed responses in terms of protection measures. Although the insights of this study apply to the Dutch context, they may also hold implications for EU member states where the police perform the individual assessment.

METHODS

Data was collected in 2021 at four police stations geographically spread across the Netherlands. Police officers were eligible for participation if they had been trained to record victims' crime reports. These police officers perform the Individual Assessment on a daily basis. They judge whether victims are vulnerable and in need of protection measures in order to identify those who are most in need of protection. To perform the Individual Assessment, Dutch police officers follow a policy guideline containing several indicators for vulnerability. These indicators refer to characteristics of the victim such as age; a list of high-risk types of crimes containing, for instance stalking, sexual assault and domestic violence; the circumstances in which the type of crime is committed; considerable harm resulting from the severity of the crime; crimes with a bias motive and crimes in which the victim has a dependency relation with the suspect. If at least one of the indicators in the guideline refers to the victim, the victim can be considered as vulnerable.

In total, 51 police officers participated in the study (M age = 41.67, SD = 12.07, range 22–65, 60.8% male, 39.2% female). Police officers had different functions: front-desk officers (n = 17), community officers (n = 8) and regular police officers (n = 26) with high variability in their years of experience in the police force (M = 14.60, SD = 10.05, range = 1–42). For this study, a data management plan and GDPR form were approved by the Ethics Review Board of the Tilburg Law School. Before the procedures were explained, participants received an informed consent form stating the goal and duration of the study guarantees that the data was stored and used anonymously, how long the data would be stored, who had access to the data and contact details in case they had questions after the study. Participants signed the form when they agreed to participate in the study. After this, the procedures were explained.

Procedure and design

The study followed the procedure of the ATSS design (Davison et al., 1983; Zanov & Davison, 2010). In this procedure, participants receive an audio vignette that closely resembles a daily practical situation and are instructed to freely articulate their thoughts out loud. The vignette pauses several times, during which participants articulate their thoughts. After a predetermined break, the vignette promptly continues. This process is repeated until the vignette ends. The freedom to articulate every thought they have allows participants unrestricted answering possibilities in

contrast to fixed questionnaires (Davison et al., 1995). This is especially beneficial to study reactions to complex and sensitive topics (Rayburn & Davison, 2002) and responses to victimisation (Bosma, 2019; Mulder & Olsohn, 2020). Additionally, the scenarios are designed and pre-tested to closely resemble practical and daily situations (Davison et al., 1983), which makes the procedure especially appropriate to study both reactions and professional judgements of participants, such as criminal justice personnel (Bosma, 2019, 2023). ATSS is thus particularly appropriate to study police officers' understanding of a heterogeneous and complex concept as vulnerability and their responses towards vulnerable victims.

Participants were carefully instructed about the procedures and then individually seated in a room without the experimenter present. Participants listened to two audio-fragments in which a victim reported either a property crime or a stalking incident. To enhance ecological validity, scenarios were pre-tested to identify possible discrepancies to everyday police practice (Bosma, 2023). The procedure and the audio-fragments were, therefore, pretested and adjusted based on a small sample of police officers ($n = 3$) who did not participate in the final sample. Each audio-fragment automatically paused for 30 seconds and then resumed 3 times, dividing the vignette into 4 different blocks. During each pause, participants were requested to articulate their thoughts out loud. In the instruction, we emphasised that participants were free to articulate each and every thought they had. After each scenario, participants received several open questions and also answered out loud within a timeframe of one minute. Due to Covid-restrictions, these questions were also pre-recorded. The open questions after each scenario were the same for each vignette and addressed (1) participants' understanding of the scenario, (2) the identification of vulnerability and (3) proposed protection measures.

The total procedure lasted approximately 18 min. One laptop played the audio fragments, while a second laptop made audio recordings of the procedure. These recordings were transcribed verbatim.

Table 1a. Example of a property crime scenario

Vignette block	Text
Block 1: Less risky lifestyle	‘Yesterday, I cycled home from work. My nightshift in the retirement home ended around 10 p.m.. I was very tired, so I really wanted to go home. The largest part of my way home crosses a residential area near the retirement home. That’s is the quickest route, because you take a shortcut from the main roads. Near the edge of the residential neighbourhood, there is quiet parc. It happened near the playground in the parc.’
Block 2: Type of crime, property crime	‘Out of the blue, a scooter came driving straight towards me. Luckily, I could stop right in time. The driver got off the scooter and approached me. He told me to give him my wallet and phone. I could not see clearly what he looked like, but he sounded young. He stood right in front of me and said that I could better give him the stuff, otherwise I would have a big problem. I thought that he had a knife, at least I saw something shiny. I felt threatened so I did what he wanted. Who knows what he was capable of? After I gave him my wallet and phone, he ran towards his scooter and drove away. It all happened so fast, I did not see the licence plate.’
Block 3: consequences (fear)	‘After he left, I quickly cycled back home. I didn’t sleep all night. This morning, I struggled to keep my food down. I don’t know if I still dare to go outside alone at night. Maybe, I can better drive together with someone from now on. In any case, I will avoid that parc. I hope that you can catch the perpetrator, so I dare to walk the streets again.’
Block 4: Prior police contacts as victim witness	‘In the police registration system, the victim has the following police contacts: – Incident: Assault; Role: Witness; Date: 04-12-2019 – Incident: Insult; Role: Victim; Date: 16-09-2019’

Table 1b. Example of a stalking scenario

Vignette block	Text
Block 1: Less risky lifestyle	'Yesterday, just after ten, I walked back to my car. I just went to the supermarket. Since I have a busy job, I often have to do the grocery shopping in the evening. At that time, it is fairly quiet in the supermarket. There were only a few cars left in the parking lot. As for the rest, there was no one in sight. I was standing close to my car looking for my car keys when I suddenly heard someone behind me.'
Block 2: Type of crime, stalking	'I immediately recognized the voice: it was my sister's friend. He sounded angry and asked why I did not respond to his texts. We had been on a few dates. That was fun, but I quickly closed it off. He, however, wanted more. For a couple of weeks, he has been sending me texts and voicemails. He is often looking for me at [the supermarket]. I have always managed to avoid him, until [yesterday]. I said that he should really stop this and that I would go to the police otherwise. This only made him more angry. He stood right in front of me, I thought that he was going to hit me. All of a sudden, two people walked past and stopped near us. He said that we would meet again some other time and walked away. After this, I quickly drove home'.
Block 3: consequences (resilience)	'Once I was home, I was very upset, but I'm not going to hide in my home. This is the last time that he bothers me like this. This morning I enrolled in a self-defence course, so I can protect myself better in the future. From now on, I can solve it myself. Next time, I'm not going to let me feel threatened like that anymore. I hope you can arrest him, so he will leave me alone from now on and I can move on.'
Block 4: Prior police contacts as victim witness	'In the police registration system, the victim has the following police contacts: - Incident: Insult; Role: Victim; Date: 11-08-2019 - Incident: Fight/Brawl; Role: Witness; Date: 09-04-2019'

Materials

Vignettes

Each participant randomly received two audio-vignettes containing a fictional male victim reporting a property crime (vignette 1: PC) and then a female victim reporting a stalking incident (vignette 2: ST). The vignette was divided into four different blocks. Each block represented a possible indicator of vulnerability: risky lifestyle, type of crime, consequences and prior police contacts (see Tables 1a and 1b for an example of the scenario and Tables A1 to A4 in Appendix A for the full texts). There were two versions per block: high vulnerability or low vulnerability. The high vulnerability version of each block was risky lifestyle, stalking, fear of crime and prior police contacts either as suspect or as victim/witness.

The low vulnerability versions of each block included low-risk lifestyle, property crime, resilience and no prior police contacts. The age of the victim differs with the risky lifestyle. The PC victim is 25 years old (risky lifestyle) or 38 (less risky lifestyle), while the ST victim is 23 years (risky lifestyle) or 34 years old (less risky lifestyle). Vulnerability, in terms of risk of repeat victimisation, is negatively associated with age (Averdijk, 2014).

In the first block (risky lifestyle), the victim explained how they arrived at the place of the incident– a place they often find themselves in. The victim either returns from work late in the evening (low-risk lifestyle) or in a drunken state returns from a party they often attend (risky lifestyle). In the second block (type of crime), the victim describes the crime, i.e. the property crime or the stalking. These two types of crimes were chosen as they may hold serious consequences for the victim. In this study, we chose property crime and stalking because property crimes are not included in the list of crimes that are indicators of vulnerability according to the policy guideline for the Individual Assessment in the Netherlands. Yet, stalking is included in this guideline. The inclusion of both types of crime, therefore, enabled a comparison between judgments of one type of crime which is included in the guideline and another type of crime which was not included in the guideline but may also refer to vulnerability. In the third block (consequences), the victim elaborates the short-term consequences of the incident, either in terms of displaying fear and avoidance behaviour or in terms of displaying resilience: taking steps to cope with the aftermath. The last block (prior police contacts) presented (1) no prior history (equally distributed), (2) two prior contacts as victim/witness (only if block 2 is low-risk lifestyle) or (3) two prior contacts as suspect regarding driving under the influence or disturbing public order (only if block 3 is high-risk lifestyle). Block 4 thus adds to the manipulation of high- vs. low-risk lifestyle.

Eight versions of vignettes 1 and 2 were constructed. These versions varied in the lifestyles, consequences and the prior police contacts. Table 2 shows the number of participants that received each variation of a block and which variations were either low or high vulnerability. Note that while some numbers are equal, these do not necessarily consist of the same participants.

To ensure that participants received two distinct scenarios, several details in the narrative were presented differently between the two types of crime. For example, the location and the specific activity differed between the PC- and ST-victim (block 1) and the display of resilience (block 3) differs: the PC-victim continued to travel across the residential area where the incident took place and would like to confront the offender, while The ST-victim signed up for a self-defence course in order to personally handle the situation, if it were to occur again (near the parking lot of the supermarket).

Table 2: Population per factor and vignette

	Vignette 1	Vignette 2
Lifestyle		
Less risky (low)	25	25
Risky (high)	26	26
Type of crime		
Property crime (low)	51	
Stalking (high)		51
Consequences		
Fear (high)	26	25
Resilience (low)	25	26
History of police contacts		
No history (low)	25	25
History of victim/witness contacts (high)	14	14
History of suspect contacts (high)	12	12
<i>n</i>	51	51

Analytical strategy

Coding of the transcripts took place in two rounds and on the basis of a structured thematic coding scheme presented in Table 3. In the first round, the corresponding author coded all data and the second author coded a subsample, after which they compared codes and solved any disagreements. Several new codes that emerged from the discussion were added to the coding scheme. In the second round, the corresponding author closely checked and reviewed the assigned codes.

Table 3. Coding scheme

Subject	Description
Vulnerability	
<i>Meaning</i>	
Impact	The direct harm caused by the incident.
Risk of (repeat) victimization	An elevated risk, either observed or actual, of becoming a victim or being revictimized.
<i>Indicators</i>	
Risky lifestyles	Frequent behavior/activity displayed before the crime took place, i.e., returning home late from work or from a party.
Type of crime	The crime itself or details regarding the crime
Consequences	The state of the victim after the incident, either emotional or in terms of behavior
History of police contacts	Either the presence or absence of prior contacts registered in police databases in the role of either victim, witness of suspect
Individual characteristics of the victim	e.g., the gender or age of the victim
Missing indicators	Participants who openly argued that information was missing.
Role police officers	
Judicial	Remarks or measures referring to finding the suspect or proving the crime.
Victim support	Remarks or measures referring to support the victim emotionally or psychologically.
Protection measures	
Physical protection measures	Measure where high urgency cases are highlighted in police systems
Internal referral	Referrals within the police organizations, e.g., to a community officer
External referral	Referrals to other organization than the police, e.g., to Victim Support Netherlands
Other protection measures*	Protection measures surfaced during the first coding round, referring to for instance, the stop conversation or the SASH-form.
Victim measures*	Measures that the victim should take themselves

* *Newley added codes after the first round of coding.*

Based on the answers on the second question after each scenario, three categories were distinguished regarding participants' identification: 'vulnerable' (V), 'not vulnerable' (NV) and 'unsure' (U). Reflecting the dichotomous nature of the European Individual Assessment as implemented in the Netherlands, the second question was a yes or no question. V- and NV-judgements could be distinguished when participants stated: *'I think the victim is [or is not] vulnerable, because ...'*. When participants considered both options without settling for either or were unsure about the answer, they were categorised in 'unsure'. Vulnerability assessments, in terms of meanings and indicator, and protection measures proposed by participants were compared between the three vulnerability categories and the two types of crime.

All quotes presented in this article have been labelled according to participant number, the scenario (PC: property crime; ST: stalking) and the vulnerability judgement (V: vulnerable; NV: not vulnerable; U: unsure). The percentages of the codes presented in the results section were based on the total number of participants per judgement in a scenario (as can be seen in total row and columns of Table 4). If, for example, code A is mentioned by 10% for PC-V, this means that 10% of the participants who identified the property crime victim as vulnerable mentioned code A in their reasoning. An overview of the percentages and frequencies mentioned in the results section can be found in Table A5 and Table A6 in Appendix A.

RESULTS

Vulnerability judgements

Overall judgements

Table 4 shows that, in both scenarios, a majority of the participants judged the victim as vulnerable. For the PC-scenario, participants identified the victim mostly as vulnerable when there were more high vulnerability indicators present. The number of high vulnerability indicators did not influence judgements for the ST-scenario, as a large number of participants identified the victim as vulnerable across all scenarios. The majority of vulnerability judgements may indicate that police officers recognise the indicators for vulnerability, especially with respect to the PC-scenario. The ST-scenario, however, shows that the number of indicators did not influence the distribution of judgements. It

may be possible that stalking in its own right is a signal for vulnerability, but it may also suggest that they assess vulnerability to be better safe than sorry.

Table 4. Number of high vulnerability-indicators per judgement

	1		2		3		4		Total N
	N	%	N	%	N	%	N	%	
Property crime									
Vulnerable	1	20.0%	8	40.0%	14	70.0%	4	66.7%	27
Not vulnerable	2	40.0%	8	40.0%	4	20/0%	1	16.7%	15
Unsure	2	40.0%	4	20.0%	2	10.0%	1	16.7%	9
Total	5	100%	20	100%	20	100%	6	100%	51
Stalking									
Vulnerable	4	66.7%	15	78.9%	13	65.0%	5	83.3%	37
Not vulnerable	0	0.0%	2	10.5%	3	15.0%	0	0.0%	5
Unsure	2	33.3%	2	10.5%	4	20.0%	1	16.7%	9
Total	6	100%	19	100%	20	100%	6	100%	51

For both scenarios, participants referred to *impact* (PC-V: 55.6%; ST-V: 35.1%) and *the risk of (repeat) victimisation* (PC-V: 37.0%; ST-V: 40.5%) as meanings of vulnerability. This corresponds with other studies where police officers are asked to identify victim vulnerability (Bach et al., 2021; Robinson et al., 2018). Especially for the fear-scenarios, the impact is often related to the emotional and possible traumatic effects of the incident. In the ST-scenario, participants argued that the incident had interrupted the victim’s private life: *‘she cannot lead her normal life, so I regard her as [a] vulnerable person’* [P1-ST-V]. Some participants also specifically noted the incident had a high impact on the victim. Participants mostly associated the risk of (repeat) victimisation to the victim’s perceived risks of future crimes. Especially in the scenarios with a fearful victim, participants argued that the victims view the risk of revictimization as high and thus feel a fear of crime: *‘he is also afraid to become victimised again, so yes I see him as vulnerable’* [P46-PC-V].

Indicators of vulnerability

Consequences

To identify vulnerability, participants most often used the consequences for the victim that manifests themselves shortly after the incident as an indicator for vulnerability (PC-V: 70.4%; ST-V: 59.5%). In the fear scenarios of both crimes, participants argued that anxiety and the subsequent behavioural change, i.e. avoidance of going outside, was important reasons to view the victim as vulnerable: *'I think this guy would classify as vulnerable, in any case he said that he became more afraid, that he also didn't dare to go outside alone anymore'* [P43-PC-V]; *'I notice that it affects her a lot, that she locks herself up in her own house, closing the shutters, troubles with sleeping, thinking that he might be at the door [...] so I surely think she's vulnerable'* [P44-ST-V]. The association between victimisation, fear and avoidance behaviour has been demonstrated in previous studies (Archer, 2019; Randa et al., 2019). Yet, it has rarely been referred to in the context of identifying vulnerability, although fear of crime has been mentioned in prior studies as a possible indicator for vulnerability (Jackson, 2009; Maglione, 2017). In their identification, participants in this study discuss how avoidance behaviour overlaps with impact and the risk of repeat victimisation, i.e. the two meanings of vulnerability. The choice to avoid going outside can be associated with the way in which the incident affected the victim emotionally (*impact*). Furthermore, avoidance behaviour can be the result of the fear the victim feels and the subsequent perceived high risk of new victimisation (*risk of repeat victimisation*). Fear is an overlapping factor and the display of avoidance behaviour is the concrete manifestation of the emotional effects of the incident and the elevated perceived risk of victimisation.

The frequent mentioning of avoidance behaviour also suggests that police officers view behavioural change rather than fear itself, as a signal of vulnerability. Responses to the resilience-scenarios seemed to enforce this proposition as participants viewed both depictions of resilience in different lights. On the one hand, they argued that the PC victim was not vulnerable, as the victim continued with their behaviour: *'I would not view him as vulnerable, simply because he states that this incident won't get to him. Next time around, he will just ride through the industrial area again'* [P8-PC-NV]. On the other hand, several participants deemed the resilient stalking victim as vulnerable, as they argued that the self-defence course was an indicator that the victim currently was vulnerable: *'Of course she herself already states that she wants to become verbally stronger through the self-*

defence course, this means that she is vulnerable' [P36-ST-V]. These views suggest that behavioural changes after an incident, regardless of whether negative (avoidance) or positive (moving towards resilience), function as a signal for vulnerability, as resilience is not yet reached.

Type of crime

A smaller proportion of the participants in both scenarios note the type of crime as indicators of vulnerability (PC-V: 37.0%; ST-V: 35.1%). Corresponding with previous research (e.g. Robinson et al., 2018, Turner et al., 2019), participants mentioned specific characteristics closely related to the incident or the type of crime. The specific information relating to the type of crime, however, differs between the two scenarios. For the PC-scenario, participants mentioned that the threat of violence, and potential presence of a weapon, seriously affected the victim: *'I think he's vulnerable, firstly, because he felt threatened during the incident'* [P19-PC-V]. Stalking in its own right seemed to be a signal for vulnerability in the ST-scenario, but several participants also mentioned the suspect's behaviour and an elevated risk of subsequent or continuing incidents: *'Yes, she's vulnerable, because the man's behaviour has not yet stopped'* [P6-ST-V]; *'For me she's vulnerable, because, she told him to stop and to leave her alone, but he doesn't do this'* [P47-ST-V].

In their articulated thoughts, participants also tended to assess the seriousness of the incident in addition to the identification of vulnerability. Some participants argued that the scenario concerned an urgent stalking case: *'definitely a form of stalking, this is a very serious crime'* [P3-ST-V]; while others regarded it as early-onset stalking or viewed it as the lesser crime of unlawfully threatening: *'apparently she implies that she is being threatened by him'* [P4-ST-V]. Additionally, participants had concerns about the legal threshold of evidence: *'How can we prove a stalking case? there is no threat present, according to criminal law, I think. So, how many times she has been bothered and if she can prove this.'* [P2-ST-V]; *'At this moment, there is little room for criminal liability'* [P10-ST-V].

Indicators left out of the judgement

Participants used risky lifestyles (PC-V: 18.5%; ST-V: 5.4%), victim characteristics (PC-V: 3.7%; ST-V: 24.3%) and the victim's police contact history (PC-V: 14.8%; ST-V: 5.4%) to a lesser extent than the indicators mentioned above. This is surprising since prior studies argued that these indicators may be important for identifying vulnerability (e.g. Averdijk, 2014; Bach et al., 2021; Clay-Warner et al., 2016; DeCamp et al., 2018;

Pratt & Turanovic, 2016; Savard et al., 2017). Although these indicators were mentioned to a lesser extent than expected based on the literature, there are still considerable differences in the percentages between both scenarios. Participants in the PC-scenario mentioned risky lifestyles with regard to frequent drinking behaviour and being in abandoned places: *'I think that he's vulnerable [...] you're not how you're supposed to be due to the alcohol consumption [...], he is cycling across that industrial area, with not a soul in sight'* [P27-PC-V]. Participants only mentioned the victim's gender in relation to the female victim in the ST-scenario: *'Yes, I think she's surely vulnerable [...] as a woman you're slightly more intimidated by a man than vice versa'* [P2-ST-V]. This may not be surprising as stalking is strongly associated with gender-based violence, whereas property crimes are not. Interestingly, participants rarely mentioned the other victim characteristic in the scenario: age. Across the three judgements, some participants mentioned indicators that were not included in the assessments but could have some relevance for the identification of vulnerability. These indicators could refer to, for instance, a victim's mental health, disabilities or non-verbal cues such as a victim's body language: *'In these situations, I always prefer a face-to-face setting so you can see in his attitude and especially the eyes how it affects a person. You can tell a lot by non-verbal communication.'* [P28-PC-NV]. Although these indicators may be absent in the scenarios, studies argue that a victim's mental health and nonverbal cues may be of importance when identifying vulnerability (e.g. Daigle & Teasdale, 2018; Dinkins & Jones, 2018).

Participants rarely associated a victim's prior police contacts with vulnerability. In their articulated thoughts, some participants argued that either the first contact with the police or prior victim/ witness contact with the police may influence how the incident affects a victim. A small number of participants also wondered whether the prior victim/ witness contacts involved the same offender as the current incident and discussed that the victim did not report any earlier stalking incidents. Other participants, however, argued that they did not see the relevance of these prior contacts: *'It tells me very little. Actually, I don't find this relevant. She was a victim once before, but that doesn't mean very much'* [P46-ST-V]. Additionally, some participants implied that prior police contacts mainly matter for offenders: *'it doesn't tell you a lot when he doesn't appear [in the police systems], he is a victim and not an offender.'* [P50-PC-V]; *'Looks like a decent hard-working man without a criminal record'* [P19-PC-V]. In responses to prior suspect contacts, participants argued that focussing on these contacts did not alter their view of the victim: *'To me this would*

not mean that I would not take this man seriously, because this man too can become a victim of a crime [P29-PC-V]; *'it is strange to judge someone based on this'* [P24-ST-V].

Protection measures

General measures

Similar to the assessment of the stalking incident, participants took on two roles both in their articulate thoughts and in their suggested response to the victim: a judicial role and a victim support role. For the judicial role, participants referred to gathering relevant information for criminal investigations, by asking for clarifications on details of the incident or documenting the crime (PC-V: 48.1%; ST-V: 70.3%). In their articulated thoughts of the PC-scenarios, participants also wanted to ask for a detailed description of the suspect or whether there was camera surveillance on the location of the crime. In their articulated thoughts for the ST-scenarios, the participants asked for details regarding the case, such as the content of the texts or whether there were witnesses.

The victim support role referred to supporting the victim's well-being and safety. In both scenarios, a majority of the participants wanted to refer the victim to an external organisation (PC-V: 74.1%; ST-V: 59.5%), most notably to Victim Support Netherlands. Participants more often proposed external referrals in the PC-scenario than the ST-scenario. This may be due to internal police protocols for stalking cases. While external referrals are not protection measures in their own right, they play an important role in directing the victim to the adequate organisation for protection or support. Participants stated in both scenarios that the victim would benefit from speaking to victim support professionals, since they are specially trained and better equipped than the police to provide emotional and psychological support: *'we as the police can only provide limited support of this kind, while victim support services may offer him more adequate support'* [P50-PC-V]. This resembles other European countries where victims are also referred to external services, such as multi-agency safeguarding hubs, for specific support measures, for specific support (Robbins et al., 2014, Shorrock et al., 2019).

Vulnerability seemed to be no condition for these referrals, since NV- and U-judgements also often mentioned external referrals in both scenarios (PC-NV: 73.3%; ST-NV: 80.0%; PC-U: 66.7%, ST-U: 66.7%). The arguments behind the referrals were also similar: *'After documenting*

the crime report, I would refer him to victim support services (..) these people are professionals that can have a conversation with him and they deal with that better than we potentially can' [P37-PC-U].

Similar to the external referrals, participants mentioned internal referrals for both V- and NV-judgements (PC-V: 22.2%; ST-V: 43.2%; PC-NV: 13.3%; ST-NV: 60.0%; PC-U: 33.3%; ST-U: 22.2%). Participants proposed internal referrals most in the ST-scenario. Internal referrals serve to direct the victim to the adequate department or person within the police organisation who can provide specific protection measures. It is likely that internal referrals are more often proposed in the stalking scenario because police policy provides more options for specific protection measures provided by the police in case of stalking than in case of property crimes.

Yet, it is striking that police officers mention both external and internal referrals regardless of the judgment on vulnerability. This suggests that vulnerability is not conditional for these measures to be proposed: every victim can be referred to an external organisation. As one participant posed: *'In any case, I would point out to her that she can always have a conversation with the people of victim support services'* [P29-ST-U]. While this may suggest the ambition to protect all victims from severe harm, it also poses several challenges for police workload as every victim is eligible for protection measures. Moreover, it poses questions on the function of the label of vulnerability as actions are not dependent on the identification of vulnerability.

Special protection measures

In addition to the referrals, police officers also mention specific protection measures, especially in regard to the ST-scenario and regardless of the judgement (PC-V: 25.9%; ST-V: 70.3%; PC-NV: 33.3%, ST-NV: 40.0%; PC-U: 33.3%; ST-U: 55.6%). Specific measures in the ST-scenario mostly referred to the stop-conversation with the suspect, which is part of the police's stalking protocol. This is a conversation between police and suspect, which discusses the severity of the suspect's behaviour and aims to deter them from continuing their behaviour. Participants, however, differed in the urgency to advise a stop-conversation. Some participants stated this conversation ought to urgently take place: *'that this man should at least get a stop-conversation to make clear that he should end these actions'* [P15-ST-V]. Others mentioned that it was a mere possibility: *'In any case, I want to discuss with her if she would like us to have a stop-conversation*

with him, so it is really clear for him' [P49-ST-V]. NV- and U-judgements also mentioned the stop-conversation, but also mentioned it as a mere possibility: *'we are definitely going to have a conversation with that man and see how he experienced the situation and subsequently already have a sort of stop-conversation'* [P31-ST-U].

Some measures were only mentioned in case of a V-judgement in the ST-scenario. An example of this was physical protection measures (ST-V: 21.6%). This refers to measures where cases are highlighted in the police registration system to alert police officers that these cases are highly urgent and require extra attention. Similarly, V-judgements wanted to use the Screening Assessment for Stalking and Harassment form (SASH), a risk assessment instrument for assessing the risk of future incidents, and to determine the next steps, an officer would take: *'a SASH-form can, in this case, also provide an indication on which follow-up actions should be taken'* [P1-ST-V]. Notably, several participants who identified the ST-victim as vulnerable advised that the victim should also take certain actions (ST-V: 37.8%). This advice mainly referred to keeping a journal of the stalking incidents, which may benefit later legal proceedings: *'she has to collect and save all information: mails, emails, WhatsApp-messages, telephone-calls, voicemail-messages. This all has to be collected to eventually get a restraining order, for instance. That process takes long'* [P10-ST-V]. Participants took on their judicial role since the journal is a key part in the evidence building: *'I think the crime report may be challenging, because it is not really [a case] according to criminal law (...) I would advise her to start keeping a journal, since this is necessary if we want to develop this in a report for stalking'* [P6-ST-V].

CONCLUSION AND DISCUSSION

The identification and protection of vulnerable victims poses several complex challenges for daily police practice. Using an ATSS design, this study aimed to analyse police officers' understanding of vulnerability as well as their response towards victims in terms of suggested protection measures. This study addressed both steps of vulnerability assessments and the police officers' reasoning behind these steps. The findings provide more clarity on how police officers identify vulnerability in daily practice and why they propose protection measures based on this assessment. Hence, these findings may inform vulnerability-focused programmes in policing and help to enhance the protection of vulnerable victims. These

insights apply to the Dutch context but may also hold implications for EU member states where the police perform the Individual Assessment.

In this study, a majority of the participants judged the victim as vulnerable. Furthermore, participants proposed protection measures regardless of the vulnerability judgement. On the one hand, this finding may suggest that police officers recognise indicators of vulnerability and furthermore strive to protect as many victims as possible. Alternatively, it may also be possible that participants identified vulnerability regardless of specific indicators. Police officers may fear that something goes horribly wrong and may act on this fear via the principle of 'better safe than sorry' (Richards et al., 2021). Participants may have identified victims as vulnerable or proposed protection measures to victims, out of fear for making incorrect decisions rather than judgement. If this reasoning is present amongst police officers, it may hold consequences for daily police workload since a large number of victims may be deemed vulnerable. Moreover, an even larger number of victims may receive protection measures, as these measures were proposed regardless of the judgement. By proposing protection measures regardless of the judgement, it appears that the measures are not necessarily related to the outcome of the assessment. The consequences then put more pressure to already limited police resources. More research is, however, needed to study the prevalence of the 'better safe than sorry' principle amongst police officers and to understand the psychological factors underlying this principle.

Interestingly, worries that victims may fall outside narrow definitions of vulnerability and thereby be excluded from receiving protection measures (Enang et al., 2019; Gilson, 2016; Robinson et al., 2016; Van der Aa, 2016) seem to be contradicted in the context of this study on the current Dutch police practice. However, if police officers propose measures regardless of the judgement, the vulnerability assessment loses its function of identifying those most in need, so that the distribution of limited resources is further pressured. To more thoroughly determine whether the assessment loses its function, more research is needed to study these effects on regional or national level.

The 'better safe than sorry' principle does not only hold consequences for the workload of police officers or the allocation of measures, but also impacts victims' feelings of empowerment and resilience. The ambition to protect victims from harm or reduce their risk of repeat victimisation

may culminate in overprotectiveness, which may damage victims rather than support them (Verza, 2022). Being labelled as vulnerable may neglect a victim's resilience and result in feeling stigmatised or patronised (Peroni & Timmer, 2013; Walklate, 2011). Victims' wishes with regard to protection measures may be a secondary consideration for police officers, whereas their own judgement is primary (Meyer & Reeves, 2021).

The findings discussed above present important challenges for police organisations in seeking the balance between the over and under protection of vulnerable victims. For police organisations, this is a cost-benefit analyses where the costs represent the available police resources and the benefits represent the number of victims who are protected from adversities. The fundamental idea is to protect victims who are most in need for protection. However, it is important that this group of victims is identified correctly. Therefore, it is necessary to aid police officers in the identification of vulnerability through trainings (Franklin et al., 2020) or risk assessment instruments based on indicators of vulnerability such as prior police contacts (*ProVict*: Geurts et al., 2021; Raaijmakers et al., 2022) or fear of crime (B-SAFER and DASH: Kebbell, 2019). Moreover, these trainings should address the dual role police officers have in their interactions with victims, as demonstrated in the articulated thoughts. Traditionally, police work revolved around investigation processes and legal concerns, such as the availability of evidence and likelihood of prosecution (Johansen et al., 2022). Vulnerability assessments, however, introduce another aspect to police work: victim support and welfare (Rumney & McPhee, 2023). Taking both these aspects into account demonstrates the complex nature of modern-day policing as it challenges police officers to position themselves (Saxton et al., 2020). To shape these trainings, future research should focus on getting a better grip of both police officers' understanding of vulnerability and their views on the place vulnerability takes in their daily work.

Participants in this study mainly used the consequences of victimisation, in terms of fear of crime and avoidance behaviour, and indicators directly related to the incident as indicators for vulnerability. Regarding the consequences of the incident, the findings suggest that participants considered behavioural changes as an indicator of vulnerability. Regarding the indicators directly related to the incident, the findings resonate with earlier quantitative studies arguing that police officers often use this type of information in their risk assessment (e.g. Robinson et al., 2018; Turner et al., 2019). The articulated thoughts underlined these earlier

findings, by demonstrating that participants took a judicial role in their approach towards the victim, thereby focusing on the incident and its characteristics.

Yet, participants left out several indicators which, according to prior studies (e.g. Clay-Warner et al., 2016; DeCamp et al., 2018; Pratt & Turanovic, 2016), are strongly associated with vulnerability, such as prior crime experiences or risky lifestyles. Discarding prior crime experiences as indicator of vulnerability, however, may influence how police officers use risk assessment instruments that use such experiences as indicators (see for instance Geurts et al., 2021; Raaijmakers et al., 2022), as police officers may not see the importance of prior crime experiences in the context of vulnerability assessments. While police officers may associate risky lifestyles with vulnerability (Bach et al., 2021), the display of such behaviour may influence other perceptions or biases of police officers, such as victim credibility (Sleath & Bull, 2017). Differing perceptions may result in discrepancies between self-perceived vulnerability and vulnerability perceived by police officers (Aihio et al., 2017). From the victim's perspective, factors such as socioeconomic status, gender and employment, and victimisation of certain types of crimes, such as hate crimes, may influence self-perceived vulnerability (Aihio et al., 2017; Perry & Alvi, 2012; Vieno et al., 2013). Yet, police officers may not recognise indicators of vulnerability due to lack of understanding, perceptions or biases (Franklin et al., 2020; St George et al., 2021; Venema, 2019). In conclusion, several indicators of vulnerability may currently fly under the radar while they are relevant for identifying and supporting vulnerable victims. In general, specific training on vulnerability indicators may aid police officers in understanding victims' behaviour and protection needs (Franklin et al., 2020). Training police officers on the importance of prior crime experiences, individual indicators and risky lifestyles as indicators of vulnerability may aid them in obtaining a broader understanding of vulnerability. Moreover, these trainings may function as a platform for police officers to share their views on specific indicators, which can further improve how vulnerability assessments are designed and how they are implemented in police practice.

Limitations

The current study provided relevant insights in how police officers identify and protect vulnerable victims. Yet, there are several limitations to this study. First, we were unable to include practical aspects of police work that may affect police officers' decision-making, such as heavy

workload (Richards et al., 2021; Turner et al., 2019), personal opinions and biases (Franklin et al., 2020; Sleath & Bull, 2017; St George et al., 2021; Venema, 2019). The ATSS design, however, allowed participants to mention different factors that would affect their decision-making, but were not mentioned in the scenarios. The openness of the procedure provided participants with unrestricted answering possibilities (Davison et al., 1995), while the design of the scenarios would closely resemble the daily police practice, and thus daily decision-making (Bosma, 2023). Although stress or time constraints were not mentioned here, future research could provide more in-depth insights on the possible influence of the hectic and complex nature of police practice on identifying vulnerability.

Second, this study was limited to specific vulnerability indicators. The ATSS design allowed participants to note other indicators, such as non-verbal cues, but scenarios with other vulnerability indicators, such as other types of crimes, may generate different responses from police officers. The association between gender-based violence and vulnerability and the association between race/ethnicity and vulnerability may be particularly important. Including a broader variation in types of crimes in future research may provide a further nuanced look on the identification and protection of vulnerable victims and possibly the 'better safe than sorry' approach. Third, the current study did not include scenarios of specific groups of victims, such as migrants, drug users or sex workers. These groups may display high vulnerability and also be less likely to be identified as vulnerable due to possible biases or marginalisation (Duggan, 2018). Future research should, therefore, study these less visible and potentially marginalised groups of vulnerable victims.

Lastly, the current study only focussed on the police while the protection and support of vulnerable victims require not only the efforts of the police, but also victim support organisations. Each organisation is specialised in providing either protection or support and both organisations need to collaborate in order to fully help the victim overcome the incident. Yet, this poses several challenges. First, definitions of vulnerability may differ between agencies (Bartkowiak-Théron & Asquith, 2017). Second, the organisations involved in protecting and supporting a victim need to have a clear understanding of their role in this collaboration (Enang et al., 2021). Since this study only focussed on the police, future research could benefit from addressing the differences between agencies and their understanding and realisation of their role within the approach.

Therefore, further research should include both the police and victim support organisations.

In conclusion, the current study provides insights into the identification of vulnerable victims and the responses to these victims. The findings apply to the Dutch context, but may also be interesting for other EU member states where police officers perform the Individual Assessment similarly. These findings provide implications for the implementation of vulnerability assessments and can guide trainings for these assessments. Hence, the current study may support police officers in identifying and eventually protecting this specific group of victims.



Chapter 3

Identifying repeat victimization using police registrations

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ABSTRACT

The current study examined to what extent a valid instrument that predicts repeat victimization can be based on a victim's prior police contacts. Police records between 2010 and 2017 were retrieved for a sample of 68,229 victims. The data was split into a training set ($n = 34,224$) and a test set ($n = 34,005$). Using logistic regression analyses in the training set, three models were developed linking prior police contacts to repeat victimization. The predictive validity was assessed in the test set. Results indicated that (a) prior police contacts as victims, suspects and witnesses were associated with an elevated risk of repeat victimization and (b) the model correctly classified a majority of both repeat victims and non-repeat victims across various cut off points. Findings demonstrated moderate to acceptable predictive validity, thereby suggesting that there is considerable room for improvement.

INTRODUCTION

Experiencing criminal victimization can severely impact an individual's life. Crime victims are more likely than non-victims to report physical and mental health issues, drug use and violent offending (Bouffard & Koeppel, 2014; Turanovic, 2019). Experiencing multiple incidents of victimization, that is repeat victimization, increases the likelihood of these adverse outcomes even more (Obsuth et al., 2018; Turner et al., 2006). Institutions, therefore, aim to support victims and protect them from further harm, for instance with intervention programs aimed to reduce the risk of repeat victimization (Grove et al., 2012; Shorrock et al., 2020). To find out which victims these interventions should be targeted at, institutions across Europe have introduced instruments to assess the risk of repeat victimization (Pavlou et al., 2019). Most of these instruments are used by police officers (e.g. Svalin et al., 2018; Turner et al., 2019), as they are often the first persons victims encounter after a victimization incident. Inspired by the growing attention on repeat victimization, the aim of the present study was to investigate to what extent a valid risk assessment instrument could solely be based on official police records and thereby enable Dutch police officers to identify victims at risk of repeat victimization.

In 2012, the European Parliament and Council of Europe accepted the Victims' Directive to set minimum standards and to strengthen the position of victims within the criminal justice system of European Union (EU) member states (European Parliament, 2012). The Victims' Directive gives particular attention to vulnerable victims including, as described in Article 22, a timely individual assessment in order to determine, amongst other things, a victim's vulnerability to repeat victimization and their specific protection needs. Police officers in EU member states play an important role in safeguarding the standards set in the Directive since they are regularly confronted with victims. Following the implementation of the Victims' Directive in 2017, national legislation obliges the Dutch police to assess a victim's vulnerability, specifically of repeat victimization. Without a supportive tool, however, such an assessment is complex since (a) only a small percentage of victims experience repeat victimization and (b) this group is highly heterogeneous in terms of the frequency and severity of their victimization experiences (Hope & Norris, 2013; Obsuth et al., 2018).

Therefore, it is important to offer a tool that assists police officers in assessing the risk of repeat victimization. For this purpose, we developed *ProVict* (short for ProtectVictims). The current study focused on the development and the validation of *ProVict*: a collection of statistical models aimed to predict the risk of repeat victimization for different types of serious crimes. For the development of this instrument, we used information on victims' police contact history, available in the police registration system. In practice, *ProVict* aims to support police officers in their assessment of a victim's vulnerability, by indicating which victims are at risk of repeat victimization and by providing an overview of the relevant police contact history used in the risk calculation. Based on this information, police officers can decide which victims may be in need of protection measures, thereby aiding them in assessing a victim's vulnerability and subsequently planning their approach towards a victim. The use of police registration data enables an automated risk assessment instrument, which avoids time-consuming and error-prone manual calculations. Hence, *ProVict* contributes to policing practice as it supplies police officers with quick information on a victim's vulnerability, enabling them to allocate their limited time and resources effectively.

The current study describes the development of *ProVict* and investigates the predictive validity of the instrument. In doing so, it aims to answer the following question: to what extent can a valid instrument to classify the risk of repeat victimization be based on a victim's prior police contacts?

Previous research on victim risk assessment instruments

A small but growing body of literature has addressed instruments aimed to aid police officers in protecting at-risk victims from further harm. As the Victims' Directive promotes the use of risk assessment instruments to support and protect victims, several member states have studied and implemented such instruments (Pavlou et al., 2019; van der Put et al., 2019). European examples are B-SAFER in Sweden (Kropp & Hart, 2004), the risk assessment instruments of the VioGén system included in Spain (López-Ossorio et al., 2019), the Screening Assessment for Stalking and Harassment (SASH) in the Netherlands (Hehemann et al., 2017) and the Domestic Abuse, Stalking and Honor Based Violence (DASH) form in the United Kingdom (Turner et al., 2019). The majority of these instruments consist of a questionnaire that police officers manually fill out to help them assess the risk of future harm, that is, professional structured judgements. Most instruments focus on a single type of

crime, particularly violent crimes in an intimate setting, such as Intimate Partner Violence (IPV; Messing & Thaller, 2013; Svalin & Levander, 2019; van der Put et al., 2019).

Although these instruments are designed to assess the risk of future harm, they focus on a specific form of repeat victimization, namely the risk that the same offender will commit the same offence to the same victim. Repeat victimization, however, also manifests in other forms, where prior victimizations of a certain type of crime result in victimization of different types of crimes, potentially committed by different offenders (de Vries & Farrell, 2018; Hope et al., 2001). Corresponding with the emphasis on the offender, most existing instruments use risk factors regarding the offender and the incident (Hehemann et al., 2017; López-Ossorio et al., 2019; van der Put et al., 2019). B-SAFER and the DASH, however, also incorporate victim vulnerability factors such as fear of crime, pregnancy or mental health problems as risk factors (CAADA, 2012; Svalin et al., 2018).

Subsequently, the DASH is the only known instrument that aims to predict the risk of repeat victimization for several types of crimes (CAADA, 2012). The DASH consists of a questionnaire that addresses the victim's situation (e.g. whether the victim is injured frightened, isolated, and showing depressive symptoms) and the offender's behaviour (e.g. his or her offending history). Police officers fill out the DASH to determine which high-risk victims should be referred to Multi-Agency Risk Assessment Conferences (MARAC), that is, multi-agency panels aimed to coordinate protection plans for vulnerable victims (Robbins et al., 2014). Nevertheless, Turner et al., (2019) demonstrated that the instrument has poor predictive validity and insufficiently enables police officers to identify high-risk victims. A possible explanation is that police officers collected data on risk factors during hectic circumstances and thus preferred to use information directly connected to the incident, while these factors have weak predictive power (Robinson et al., 2018; Turner et al., 2019). Risk assessment instruments consisting of forms, that is, professional structured judgements, however, may face this problem due to the manual and error-prone collection of information (see also Svalin et al., 2018). In this context, van der Put et al. (2019) demonstrate that actuarial instruments, which rely on statistical methods to include risk factors in the assessment, outperform professional structured judgements.

In conclusion, most existing risk assessment instruments predict repeat victimization from the perspective of the offender and not the victim. Moreover, most existing instruments aimed to predict repeat victimization are limited to specific types of crimes, whereas victims may also be at risk of being confronted with other types of crimes and harms (Clay-Warner et al., 2016; Farrell et al., 1995; Lantz & Ruback, 2017). This study, therefore, addressed the development and validation of an actuarial instrument (*ProVict*) aimed to estimate the risk of repeat victimization directly from the victim's perspective and for a wider range of crimes than typically addressed. The validation of this instrument is set in the setting of the Dutch National Police as Dutch regulations oblige police officers to assess a victim's vulnerability in terms of repeat victimization.

Risk factors for repeat victimization

Relevant risk factors for repeat victimization, such as substance abuse or psychological distress (e.g. Daigle & Teasdale, 2018; Ruback et al., 2014), are rarely available in police data. Yet, police data do contain prior crime experiences, which are also considered important risk factors for repeat victimization (e.g. DeCamp et al., 2018; Iratzoqui, 2018; Obsuth et al., 2018). In this study, we, therefore, incorporated a victim's prior crime experiences into the risk assessment. Prior crime experiences here represent the prior police contacts of a victim as registered in the police database. The study builds upon the growing literature on predictive policing in which records on prior police contacts are regularly used to identify high-risk victims and offenders (e.g. Brimicombe, 2018; Wientjes et al., 2017). Prior police contacts may pertain to different types of contacts, depending on the role of the individual involved: victim contacts, offender contacts and witness contacts.

First, previous contacts as a victim are a key risk factor for repeat victimization (Farrell et al., 1995; Farrell and Pease, 1993). Experiencing violent victimizations (Clay-Warner et al., 2016; Turanovic et al., 2018) or property victimizations (Bernasco, 2008; Lantz & Ruback, 2017) strongly influence the risk of repeat victimization. From the victim's perspective, several studies find that victims may change their behaviour in ways that increase the risk of repeat victimization (Clay-Warner et al., 2016; Iratzoqui, 2018). Victims may, for instance, start to engage in risky lifestyles, such as substance abuse (Engström, 2018; Pratt & Turanovic, 2016; Ruback et al., 2014). Obsuth et al. (2018) furthermore demonstrated that experiencing victimization implied an increased risk of repeat

victimization and pointed out that the risk was further increased when victims had experienced various types of crimes.

Second, previous offending contacts relate to repeat victimization. Offenders too are more exposed to the risk of victimization since they are more likely to be engaged in a risky lifestyle (DeCamp et al., 2018; Sullivan et al., 2015). Offending may be connected to revengeful or protective behaviour and result in initial offenders becoming victimized themselves (Averdijk & Bernasco, 2015). Aaltonen (2017) demonstrated that previous co-offenders are often the ones who victimize persons with prior offending experiences.

Third, experiencing crimes as a witness may also increase the likelihood of future victimization. Studies showed that people who witness crimes are more prone to future victimization since they pass more time in criminogenic settings (Engström, 2018; Pratt & Turanovic, 2016). Grubb & Bouffard (2015) found that witnessing parental IPV as a juvenile increases the risk of victimization in adulthood. Pinchevsky et al. (2014) demonstrated that witnessing a crime may result in behavioural changes such as substance abuse and thereby increase the risk of future victimization.

The present study focuses on the influence of prior police contacts, but also includes age and gender in the risk assessment since both are considered to be important risk factors for repeat victimization. The risk of victimization varies between different age categories (DeCamp & Zaykowski, 2015). Furthermore, Savard et al. (2017) found that for several types of crime women were more likely to be victimized. In conclusion, the present study addresses an instrument that includes a victim's prior police contacts, age, and gender in the risk assessment.

Present study

The present study focused on the development and validation of *ProVict*: a collection of statistical models aimed to assess the risk of repeat victimization. This study expands prior research in several ways. First, this study focuses directly on classifying repeat victims, whereas existing instruments often focus on offenders. Hence, this study only addressed individual-specific risk assessment, implying that area-based risk assessments to predict near-repeat victimization fall beyond the scope of this study. The victim-centred approach of this study aids police officers by indicating which victims are at risk and thus in

need of protection measures, thereby guiding police officers in their approach towards victims. Second, this study aimed to predict repeat victimization for a broad range of serious crimes, thereby including a wider range of victimization types than previous instruments. Third, and most importantly, *ProVict* was based on data available in the police database. In contrast to existing manual risk assessment instruments, the use of police registration data enabled an automated risk assessment instrument. This avoids time-consuming and error-prone manual risk assessments and thus enables police officers to use their limited time more effectively. In sum, the current study thus aimed to determine to what extent prior police contacts can be used to develop a valid risk assessment instrument for repeat victimization.

METHOD

ProVict relies on data stored in BVH: the registration system in which Dutch police officers record daily reports, incidents and small-scale investigations. More precisely, BVH includes victims' reports to the police, witness statements and the results of interrogations of suspects. BVH thus comprises the bulk of police data with the exception of for instance information on large-scale projects, such as organized crime, for which different systems are in use. In BVH, police officers record different types of contacts by means of a wide range of crime codes reflecting the type of crime (e.g. robbery or assault). Furthermore, police officers assign a specific role (e.g. victim or offender) to natural and legal persons involved in a police contact, reflecting the person's involvement in the event. In this study, we use the combination of crime types and roles to determine the nature of a victim's prior police contacts (e.g. victim of an assault or witness of a robbery).

Sample and design

For the development and validation of the instrument, we used a simple random sampling technique to obtain a sample ($n = 70,000$) of individuals who registered in the police system as a victim in 2014 (total $N = 638,683$). Next, we obtained all police records regarding these individuals for the period 2010–2017. Victims who passed away between 2014 and 2017 and victims with an unknown date of birth or gender were excluded. The final dataset was anonymized and included 68,229 victims (54.9% male, 45.1% female) aged between 0 and 100 years ($M = 41.3$, $SD = 17.3$).

We defined the last victimization incident in 2014 as the index incident. Next, police contacts during the 4 years *prior* to the index incident were used to estimate the risk of a victimization incident in the two years *after* the index incident (Figure 1). We chose a 4-year period of police contact history to include the most substantial history as possible, considering our data and the applicable legal data restrictions.³ We chose a 2-year period to predict victimization in the short to mid-long term. As each individual included in the sample experienced victimization at least once in 2014 (the index incident), any victimization incident in the two years after the index incident was defined as repeat victimization. This does not rule out that victims may have experienced repeat victimization prior to the index incident.

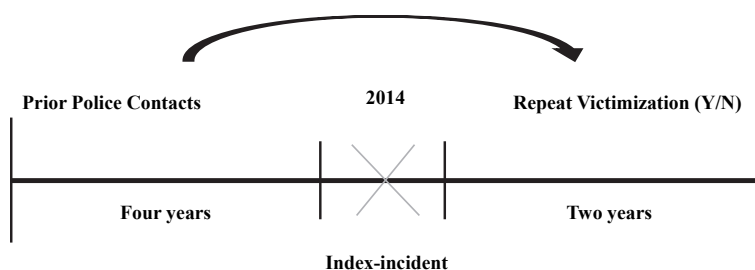


Figure 1. Research design

Following other studies aimed at developing risk assessment instruments based on police records (e.g. Assink et al., 2015; Van der Put, 2014; Wientjes et al., 2017), we used a simple random sampling technique to split the data 50–50 into a training set ($n = 34,224$) and a test set ($n = 34,005$). Using the training set, models that predicted repeat victimization in the two years after the index incident was developed. Subsequently, the models' predictive validity was assessed in the test set. Although other studies that develop risk assessment instruments have often used larger training sets than test sets (e.g. 75–25 or 80–20), we wanted both samples to be as large as possible. A larger training set provides more accurate parameter estimates, while a larger test set provides more accurate estimates of model performance. Since we preferred to optimize both at the same time, we opted for a 50–50 split.

³ In practice, police officers are allowed to only look back at registrations up to five years prior to the index-incident. Our data, however, only made it possible to look back four years which is also within the legal restrictions.

Dependent variables: repeat victimization

The dichotomous dependent variables reflected whether or not the victim had experienced a victimization-incident in the two years *after* the index incident. Three types of repeat victimization were distinguished: repeat victimization of severe crimes, less severe crimes, and a combination of the prior two outcomes. According to policy documents of the Dutch police, *severe crimes* include crimes such as stalking, sexual assault and human trafficking. These crimes are included in the individual assessment. Victims of these crimes are considered to have an elevated risk of repeat victimization, secondary victimization, intimidation and retaliation. Experiencing these crimes may thus have severe consequences and predicting these crimes would help prevent serious future harm. Therefore, we included this type of repeat victimization as a dependent variable. Although *less severe crimes* are excluded from the individual assessment procedure that was implemented by the Dutch police, they may still have major consequences for the victim. Therefore, we also investigated repeat victimization of less severe crimes. Examples of *less severe crimes* are burglary, blackmail and threat. A full list of the included *severe* and *less severe crimes* is added in Appendix B (Table B1). Finally, we investigated repeat victimization *combined*, a category combining the categories of severe and less severe crimes. Victimization experiences in the two years *after* the index incident, either from *severe* or *less severe crimes*, are referred to as this variable. By including this variable, we could test the predictive validity of a model that predicts repeat victimization of serious crimes in general, which may be preferable in police practice.

We classified the three types of repeat victimization as dichotomous variables that each reflected whether or not a victim experienced at least one new victimization incident in the two years after the index incident. For instance, if a victim experienced a severe crime in the two years after the index incident, this victim experienced repeat victimization for severe crimes. In the total sample, 0.7 percent of the victims experienced repeat victimization of severe crimes ($n = 452$), while 2.4 percent of the victims experienced repeat victimization of less severe crimes ($n = 1647$). With regard to repeat victimization combined, 3 percent of the victims were revictimized in the two years after the index incident ($n = 2027$).

Independent variables

This study uses a victim's prior police contacts, age and gender as the independent variables. All police contacts registered in the four years prior to the index incident were used to construct the independent

variables reflecting the victim's prior police contacts. The variables were based on the combinations of crime codes, reflecting the type of crime under which the police classified the incident and the role of the person involved. Police contacts include the roles of suspect, victim and witness. For this study, the wide range of different crime codes available in BVH was assigned to more comprehensive crime categories on the basis of the literature (Lauritsen & Cork, 2017) and discussions with experienced police officers. The most important categories referred to 'violent acts against a person', 'violent acts of a sexual nature', 'property crimes', 'acts involving fraud, deception or corruption', 'acts against property only', 'acts against public order and authority' and 'acts involving controlled substances'. These categories were divided into sub-categories. For example, 'property crimes' was split in 'theft without violence', 'robbery', 'burglary', among other types of property crimes. Altogether, this resulted in 164 crime categories.

To these categories we added the three roles, resulting ($164 \times 3 =$) 492 crime category role combinations. The variables reflected the number of police contacts during the four years prior to the index incident regarding that specific crime category-role combination. For example, a score of 5 on the predictor variable 'victim stalking' indicated that the individual had five registrations as a victim of a stalking incident in the four years prior to the index incident. Likewise, a score of 2 on the variable 'suspect abuse' indicated that the individual had two registrations as a suspect of an assault in the four years prior to the index incident.

In addition to these crime category-role combinations, we included variation in types of victimization, age, age-squared and gender as independent variables. The variation in types of victimization ($M = 0.4$, $SD = 0.7$, range = 0–7) was measured by counting the number of crime categories for which an individual had a registration as a victim during the four years prior to the index incident. For example, if a victim had experienced a victimization incident in the crime categories 'theft without violence' and 'stalking', the variation in types of victimization was two. Age reflected the age at the date of the index incident. Age squared was included to account for the possibility of a quadratic association between age and victimization (DeCamp & Zaykowski, 2015). Gender was included as a dichotomous variable, that is, females and males. Eventually, 496 predictors were included in the models.

Analysis strategy

Forward stepwise logistic regression analysis, comprising both the stepwise modelling and the final logit model fit, was used to develop the model in the training set. A practical advantage of logistic regression analyses is that it, in contrast to machine learning methods, allows us to easily explain the calculation of risk scores through an interpretable formula. Furthermore, the forward stepwise procedure results in a parsimonious model. In a stepwise procedure, variables are individually added to the model and only included when, based on the likelihood ratio, the addition provides a significant change in the log likelihood. After each entry, variables already included in the model are evaluated for possible removal. Variables are removed from the model if they no longer significantly improve the model. The process ends when no variables are left that meet either the entry or the removal criteria. Based on the resulting models, risk scores for repeat victimization could be calculated.

Next, we evaluated the predictive validity of the model in the test set using the following discrimination and calibration indicators: Area Under the Curve (AUC), sensitivity, specificity, the Positive Predicted Value (PPV) and the Negative Predicted Value (NPV). Discrimination indicators, such as the AUC, sensitivity and specificity reflect to what extent an instrument distinguishes between high-risk groups and low-risk groups. The AUC is a traditional indicator for evaluating an instrument's accuracy (Messing and Thaller, 2013; Rice and Harris, 2005; van der Put et al., 2019) and reflects the probability that a randomly selected repeat victim has a higher risk score than a randomly selected non-repeat victim. According to the rules of thumb proposed by Hosmer and Lemeshow (2000), AUCs between 0.6 and 0.7 are moderate, AUCs between 0.7 and 0.8 are acceptable and AUCs between 0.8 and 0.9 are excellent.

Sensitivity refers to the proportion of repeat victims classified as high-risk. Specificity refers to the proportion of non-repeat victims classified to be low-risk. Calibration indicators, such as the PPV and NPV, reflect the correspondence between the calculated risk scores and the actual observed risks of repeat victimization in the sample. The PPV refers to the proportion of high-risk victims who do indeed experience repeat victimization (i.e. true positives), whereas the NPV reflects the proportion of low-risk victims who do not experience repeat victimization (i.e. true negatives). Although The PPV and NPV both rely heavily on the distribution of the outcome in the sample (Singh, 2013), these indicators provide useful insights into the practical consequences of the choice

of specific threshold levels for distinguishing low-risk from high-risk victims.

We used the AUC as an indicator to generally evaluate the accuracy of the models. The other predictive validity indicators were calculated to illustrate the consequences of the models across a range of cut-off points. To obtain the cut-off points, we calculated the percentile values associated with the risk scores in the training set. These percentile values were subsequently used as cut-off points. Individuals who scored lower than a cut-off point were classified in the low-risk category, whereas individuals with scores higher than or equal to a cut-off point were classified as high-risk. The first cut-off point was set at the percentile value corresponding to the point where the top 50 percent of the risk scores belonged to the high-risk category. The next cut-off point was set at the point where the top 45 percent of the risk scores was high-risk. Eventually, by taking steps of 5 percent, the predictive we calculated validity indicators for 10 cut-off points.

RESULTS

Model development

The model for repeat victimization of severe crimes performed best (Nagelkerke $R^2 = .13$, $\chi^2 = 343.09$, $p < .001$, 20 predictors included). The models for repeat victimization of less severe crimes (Nagelkerke $R^2 = .09$, $\chi^2 = 590.90$, $p < .001$, 21 predictors included) and repeat victimization combined performed slightly less well (Nagelkerke $R^2 = .10$, $\chi^2 = 792.08$, $p < .001$, 32 predictors included). All models included police contacts as suspect, victim and witness. Suspect contacts mostly referred to violent crime categories, such as abuse or human smuggling, and violations. Victim contacts referred to a variety of violent crimes, such as human trafficking, abuse or stalking, and property crimes, such as theft. A considerable number of risk factors in each model referred to witness contacts, such as witnesses of abuse or threat. Specific information on the models can be found in Appendix B (Tables B2 to B4).

There were some similarities across all models regarding the included risk factors. *Variation in types of victimization* positively related to repeat victimization in all three models (Exp(B)range=1.291–1.340, $p < .001$), indicating that being a victim of a greater variety of crime types increased the risk of repeat victimization. Likewise, suspect human smuggling

(Exp(B)range=12.961–46.906, severe crimes: $p < .001$, combined and less severe crimes: $p < .010$), victim insult (Exp(B) range=1.297–1.573, combined and severe crimes: $p < .001$, less severe crimes: $p < .010$), witness abuse (Exp(B) range=1.354– 1.759, $p < .001$), witness violence without follow-up (Exp(B) range=1.059–1.086, combined and severe crimes: $p < .001$, less severe crimes: $p < .010$) and witness unwell individual (Exp(B) range=1.422–1.705, combined and severe crimes: $p < .001$, less severe crimes: $p < .010$) correlated positively with the risk of repeat victimization, indicating that having more registrations in these crime–role categories increased the risk of repeat victimization.

Age was included in the models for severe crimes (Exp(B) = .969, $p < .001$) and repeat victimization combined (Exp(B) = .995, $p < .050$). In both models, age was negatively correlated with repeat victimization of severe crimes and repeat victimization combined, implying that older victims had a lower risk of repeat victimization. Gender was only included in the model for less severe crimes (Exp(B) = .757, $p < .010$), indicating that women run a lower risk of repeat victimization of less severe crimes than men.

Predictive validity

Table 1 presents the AUC values for all three outcomes in the test set. The AUC for repeat victimization of severe crimes was highest (.773) and indicated acceptable discrimination. The AUC value for repeat victimization combined was close to 0.7, indicating moderate to acceptable discrimination. For repeat victimization of less severe crimes, the AUC indicated moderate discrimination. The non-overlapping CI's suggest that the AUC value of the model for severe crimes was significantly higher than the AUC values of the other two models.

Table 1. AUC Values Test set

	AUC [95% CI]	S.E.
Severe crimes	.773 [.743 - .804]	0.016
Less severe crimes	.687 [.664 - .709]	0.011
Combined	.697 [.679 - .716]	0.009

Note: Test set $n = 34,005$.

Tables 2 to 4 present the predictive validity indicators for all three outcomes across different cut-off points. Focusing on sensitivity and specificity, Tables 2 and 3 show that repeat victimization of severe crimes and repeat victimization combined correctly classified a majority of repeat and non-repeat victims for cut-off points between the top 50 percent and top 20 percent. A trade-off between sensitivity and specificity can be noted for all outcomes. Sensitivity decreased with a higher cut-off point, while specificity increased. In line with the AUC values, the model for severe crimes demonstrated a higher sensitivity across all cut-off points than repeat victimization combined. Based on the results regarding the AUC as well as sensitivity and specificity, repeat victimization of severe crimes and repeat victimization combined demonstrated acceptable predictive validity.

In correspondence with the AUC values, the model for less severe crimes showed moderate predictive validity. Focusing on sensitivity, Table 4 illustrates that a majority of repeat victims of less severe crimes was correctly classified as high-risk for cut-off points between the top 50 percent and the top 30 percent. With respect to specificity, however, it can be seen that for only a number of cut-off points (top 50% to top 35%), the model classified a relatively small proportion (36.5%) of non-repeat victims correctly as low-risk.

Across the three models, the PPVs indicated that for all cut-off points the high-risk category included a small proportion of repeat victims (4.3–15% for repeat victimization combined; 1.1–4.0% for severe crimes; 3.0–10.7% for less severe crimes). Simultaneously, the NPV indicates that, for all cut-off points, the low-risk category is largely comprised of non-repeat victims (98.4–97.7% for repeat victimization combined; 99.8–99.5% for severe crimes; 98.6–98% for less severe crimes).

Table 2. Predictive validity indicators for repeat victimization combined

Cut-off points	n High-risk	n Low-risk	Sensitivity	Specificity	PPV	NPV
top 50%	17,230	16,775	73.5%	50.0%	4.3%	98.4%
top 45%	15,265	18,740	70.6%	55.9%	4.7%	98.4%
top 40%	13,604	20,401	67.7%	60.8%	5.0%	98.4%
top 35%	11,893	22,112	63.8%	65.9%	5.4%	98.3%
top 30%	10,169	23,836	59.6%	71.0%	5.9%	98.3%
top 25%	8547	25,458	55.6%	75.8%	6.6%	98.2%
top 20%	6803	27,202	50.2%	80.9%	7.5%	98.2%
top 15%	5122	28,883	42.4%	85.8%	8.4%	98.0%
top 10%	3392	30,613	34.7%	90.8%	10.3%	97.8%
top 5%	1695	32,310	25.2%	95.6%	15.0%	97.7%

Note: Test Set $n = 34,005$.

Table 3. Predictive validity indicators for severe crimes

Cut-off points	n High-risk	n Low-risk	Sensitivity	Specificity	PPV	NPV
top 50%	16,991	17,014	83.8%	50.3%	1.1%	99.8%
top 45%	15,319	18,686	81.5%	55.2%	1.2%	99.8%
top 40%	13,659	20,346	77.9%	60.1%	1.3%	99.8%
top 35%	11,930	22,075	74.3%	65.2%	1.4%	99.7%
top 30%	10,355	23,650	70.7%	69.8%	1.5%	99.7%
top 25%	8632	25,373	64.9%	74.9%	1.7%	99.7%
top 20%	7122	26,883	58.1%	79.3%	1.8%	99.7%
top 15%	5094	28,911	48.6%	85.2%	2.1%	99.6%
top 10%	3374	30,631	42.3%	90.3%	2.8%	99.6%
top 5%	1664	32,341	30.2%	95.3%	4.0%	99.5%

Note: Test Set $n = 34,005$.

Table 4. Predictive validity indicators for less severe crimes

Cut-off points	n High-risk	n Low-risk	Sensitivity	Specificity	PPV	NPV
top 50%	21,724	12,281	79.7%	36.5%	3.0%	98.6%
top 45%	21,724	12,281	79.7%	36.5%	3.0%	98.6%
top 40%	21,724	12,281	79.7%	36.5%	3.0%	98.6%
top 35%	21,724	12,281	79.7%	36.5%	3.0%	98.6%
top 30%	10,254	23,751	59.4%	70.6%	4.7%	98.6%
top 25%	9464	24,541	55.9%	72.9%	4.8%	98.5%
top 20%	9464	24,541	55.9%	72.9%	4.8%	98.5%
top 15%	5113	28,892	41.9%	85.6%	6.7%	98.4%
top 10%	3443	30,562	33.3%	90.4%	7.9%	98.2%
top 5%	1699	32,306	22.1%	95.4%	10.7%	98.0%

Note: Test Set $n = 34,005$.

DISCUSSION

The current study focused on the development and validation of *ProVict*, a collection of logistic regression models that calculate the risk of repeat victimization based on prior police contacts. For this purpose, we examined to what extent prior police contacts could be used to develop a valid risk assessment instrument for repeat victimization of severe crimes, less severe crimes and a combination of the two prior outcomes. *ProVict* provides police officers with an indication, of which victims are at risk of repeat victimization and an overview of police contacts used for the risk calculation. With this information, the instrument aids police officers in assessing which victims may be in need of protection measures. *ProVict* improves existing risk assessment instruments by using police registration data, thereby enabling an automated risk assessment instrument, which avoids time-consuming and error-prone manual risk assessments.

The risk factors in our models mostly corresponded with prior research, suggesting that being a suspect of violent crimes, a victim of property or violent crimes and witness of violent crimes increases the risk of repeat victimization (e.g. Aaltonen, 2017; Clay-Warner et al., 2016; DeCamp et al., 2018; Grubb & Bouffard, 2015; Turanovic, 2019). Academic literature proposes two theoretical perspectives explaining repeat victimization: the state dependency perspective and the population heterogeneity perspective (Farrell et al., 1995; Nagin & Paternoster, 2000). State dependency

implies that an initial crime experience ‘boosts’ the risk of subsequent crime experiences. For example, after experiencing victimization, victims may start engaging in risky lifestyles, such as substance abuse, or may experience mental health issues (Blokland & Nieuwbeerta, 2010; Clay-Warner et al., 2016; Turanovic et al., 2018). Considering our findings, this implies that victims of insult crimes or witnesses of violent crimes may start experiencing mental health issues or adapt their behaviour, making them more prone to repeat victimization (Pinchevsky et al., 2014; Randa et al., 2019). Population heterogeneity implies that some individuals have an underlying propensity for victimization (e.g. specific individual characteristics, such as a low self-control) thereby making them more prone to both initial and repeat victimization (Nagin & Paternoster, 2000). Such individual characteristics may, partly, explain the associations we found between prior police contacts and future revictimization. Yet, interpreting the coefficients from our models requires some care, since they do not necessarily point to causal effects. Our aim for this study was not to investigate what factors explain repeat victimization, but rather to assess which factors could contribute to identifying high-risk and low-risk individuals regarding repeat victimization.

With regard to the predictive validity of this instrument, the AUC values suggested that the models performed moderate to acceptable in terms of discrimination. The model for severe crimes demonstrated the highest AUC value (.773) and indicated acceptable discrimination (Hosmer & Lemeshow, 2000), thereby suggesting that this model may be preferred in practice. The AUC value for repeat victimization combined was close to the threshold of .70, indicating moderate to acceptable discrimination.

Prior research on, for example, the DASH, reported AUC values of .50 to .60 (Turner et al., 2019), while other risk assessment instruments demonstrated AUC values ranging from .50 to .78 (Messing & Thaller, 2013; van der Put et al., 2019). Hence, repeat victimization of less severe crimes and repeat victimization combined performed similarly to existing instruments, while the model for severe crimes had a somewhat better AUC value. The discrimination indicators demonstrated here are similar to those reported in previous studies (Messing & Campbell, 2016; Svalin & Levander, 2019). For a range of cut-off points, repeat victimization of severe crimes and repeat victimization combined correctly classified a majority of the repeat victims in the high-risk category and a majority of the non-repeat victims in the low-risk category.

Our findings suggest that there is still room for improvement since some repeat victims were classified as low-risk, that is, false negatives and a considerable percentage of non-repeat victims were classified as high risk, that is, false positives. False negatives may go undetected due to the possible exposure to risk factors that are not included in our models, such as mental health issues, risky lifestyles or social networks (e.g. Daigle & Teasdale, 2018; Rokven et al., 2017; Ruback et al., 2014). On the other hand, some false positives may not have been revictimized due to the buffering effects of protective factors, such as family bonds (DeCamp et al., 2018), which are also not included in the models. Additional data on these risk and protective factors could improve the correct classification of both repeat victims and non-repeat victims, thus reducing the number of false negatives and false positives. Information on these factors may be present in verbatim reports written by police officers. Text-mining analysis of these reports may be a promising avenue for future research. Note that some false positives, however, may actually be 'true' positives as they may have been revictimized beyond the time frame of our study or may not have reported new victimization, possibly as a result of prior negative experiences with the police (Koster, 2017).

The high number of false positives is not surprising, since calibration indicators strongly depend on the distribution of an event in the sample (Singh, 2013), and repeat a victimization is a rare event. On the one hand, the considerable amount of false positives may be too costly in practice, since police officers may have to give extra attention to a large group of victims. Providing measures to the false-positive victims may furthermore frighten them, thereby increasing the fear of crime and subsequently the risk of repeat victimization. On the other hand, the benefits of protecting victims from serious harm may outweigh the costs of incorrectly classifying non-repeat victims in the high-risk category. As the results demonstrated, for most cut-off points, a majority of the repeat victims were correctly classified in the high-risk category. In other words, from the large group of victims that the Dutch police encounter, the instrument distinguishes a substantial proportion of the repeat victims. Subsequently, police officers can plan their approach towards these victims and potentially take specific measures to protect them from serious harm in the future. Regarding the severity of the crimes studied here, the benefits of protecting these victims from this type of serious harm may be considerably high, and thus outweigh the costs of the incorrectly classified non-repeat victims. In addition, the use of this instrument may improve victims' perceptions of the police. Giving extra

attention to victims may result in more positive attitudes towards the police as victims may feel more supported by police officers (Elliott et al., 2014).

Nevertheless, it is important that a solid cost-benefit analysis accompanies the implementation of the instrument in practice. The outcome of such an analysis should guide the eventual choice of a specific cut-off point. Additionally, it is important to comprehensively assess the fairness of the instrument and the decision-making the instrument informs (Mitchell et al., 2021). Moreover, it is important to evaluate the instrument from both a statistical and policing perspective, thereby taking into consideration not only its predictive validity and discrimination (in terms of, e.g. AUC), but also the consequences of false positives and false negatives in police practice.

The present study has several other limitations. First, although stepwise modelling is frequently used for the development of predictive risk models (e.g. Billings et al., 2006, Henning et al., 2021, Palazzo & Evans, 1993), several studies argue that it may not always result in the best model due to multiple testing issues (Kuhn & Johnson, 2013). Other methods such as lasso or elastic net regression might provide better results in terms of predictive performance. By performing a thorough validation procedure with independent data, however, we attempted to minimize the limitations possibly associated with the use of the forward stepwise procedure. Nevertheless, we acknowledge the importance of critically assessing whether other variable selection methods may provide better outcomes in samples with specific characteristics. Additionally, future studies could investigate whether the models can be improved by including interactions between predictors.

As indicated, we performed the validation on a subsample of the total sample, that is, the test set. While this validation procedure reduces the risk of model overfitting, a more optimal validation procedure would be to use a more recent validation sample (Van der Put et al., 2019). Unfortunately, however, this was not possible for the current study, since such a sample was not available. Validation of the model on a more recent sample is an important suggestion for future research, as it provides better insights into the predictive validity of the instrument when used in practice.

Second, this study may underestimate the prevalence of repeat victimization since victims may not report new crimes to the police. Willingness to cooperate with the police, namely, decreases when victims were disappointed with prior police performance (Koster et al., 2018). In reality, the number of repeat victims may thus be higher than police registration data suggests, thereby implying the number of false positives may be overestimated in this study, as not all repeat victims will report a revictimization to the police. An instrument like *ProVict*, in addition to effective follow-up, may help to increase the willingness to report new crimes as victims may perceive the police performance more positively (Koster, 2017).

Third, the current study does not include the professional judgment of police officers. A risk assessment instrument that automatically calculates the risk of repeat victimization may, however, benefit from these judgements (Oswald et al., 2018). Although assessing the risk of repeat victimization may be a complex task without the aid of a validated tool, police officers are able to identify a certain amount of risk factors (Robinson et al., 2018). Yet, the predictive validity of a risk assessment instrument may decrease when professionals can overrule predictions (Orton et al., 2020). Future research should, for example, through experimental vignette designs, aim to understand how police officers judge possible high-risk cases and what indicators they use in this assessment.

Furthermore, special attention should be given to the implementation of the instrument. Successful implementation of risk assessment instruments is strongly related to positive attitudes of the users towards the instrument (Viljoen et al., 2018). Further research should therefore address police officers' attitudes towards *ProVict* in order to ensure a successful implementation and effective use of the instrument. Finally, *ProVict* was developed and validated to apply to the Dutch police practice.

While direct applications of the instrument in other European countries depend on the specific availability of registration data, the general avenue of automated risk assessment instruments may be interesting for any type of victim-supporting authorities across Europe. It is however important to assure that procedures, in analysis or eventual implementation, are in line with the EU General Data Protection Regulation (GDPR) when reliant on sharing registration data.

Although there is considerable room for improvement, this study demonstrated that prior police contacts may be used to develop a valid instrument to assess the risk of repeat victimization. Such an instrument has the potential to aid Dutch police officers in identifying victims at risk of repeat victimization and eventually guiding them in the support and protection of these victims need.

Chapter 4

Identifying repeat victimization using a combination of different types of police registrations

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4 The role of the first and second author of this paper was equivalent, and the role of the remaining authors was small.

ABSTRACT

Following the EU Victim Directive, Dutch police officers are obliged to assess a victim's vulnerability to repeat victimization. This study explored the utility of unstructured police information for the prediction of repeat victimization, as well as its incremental value over and above structured police information. Police records over a period of 6 years were retrieved for a sample of 116,680 victims. Unstructured information was transformed into numeric features using count-vector and TF/IDF methods. Classification models were built using decision tree and random forest models. AUC values indicate that a combination of structured and unstructured police information could be used to correctly classify a majority of repeat and non-repeat victims.

INTRODUCTION

In the Netherlands, almost 2 million individuals annually report being a victim of one or more types of crimes such as violent crimes (e.g., threat, assault, sexual crimes), property crimes (e.g., burglary, theft, robbery), or vandalism (Statistics Netherlands, 2020). Criminal victimization can have extensive impact on victims' lives (Jackson & Gouseti, 2016; Lefebvre et al., 2021). From all individuals that do experience victimization, a small proportion of individuals experience repeat victimization, thereby accounting for a large percentage of the total number of victimization incidents reported (Gabor & Mata, 2004; SooHyun et al., 2017). Victims of violent crimes experience negative effects of victimization for longer periods of time compared to victims of other crimes (Jackson & Gouseti, 2016), this study, therefore, focused on repeat victimization of violent crimes.

In 2012, the EU Victim Directive was accepted by the European Parliament, thereby establishing minimum standards on the rights, support, and protection of victims of crime (European Parliament, 2012). Article 22 of this directive describes that Member States shall ensure a timely and individual assessment of victims to identify vulnerability, specific protection needs and to discuss special protection measures. Police officers play a crucial role in the support and protection of victims as they frequently encounter victims of crime. As a result of the Victim Directive, and more specifically article 22, Dutch police developed an individual assessment procedure for all victims that report a crime to the police. As part of this procedure, Dutch police officers are expected to review a victim's police contact history and discuss a victim's vulnerability to repeat victimization. Police officers, however, have limited time and reviewing a victim's police contact history can be a time-consuming and laborious process. To support police officers in the individual assessment of victims, Raaijmakers et al. (2022) developed a risk assessment instrument that estimates the risk of repeat victimization for victims that report a crime to the police. This instrument, called *ProVict*, displays whether a victim is classified as high- or low-risk for repeat victimization and it summarizes a victim's police contact history that contributed to the classification. The *ProVict* score may guide police officers in their assessment of a victim's vulnerability to repeat victimization.

ProVict is based on structured information regarding victims' police contact history as retrieved from the Dutch police database, as well as

on victims' age and gender. The risk score is based on the number of prior police contacts and the types of crimes the victim has previously been involved in. Although the validation study demonstrated that the predictive validity of *ProVict* was acceptable (Raaijmakers et al., 2022), findings suggest that there is still considerable room for improvement in the prediction of repeat victimization of violent crimes. This improvement could possibly be realized by not only using structured police information, but also using unstructured police information (e.g., verbatim reports that contain police officers' transcription of interviews with victims, witnesses, and suspects, or their own observations) that is included in the Dutch police database. This unstructured police information may include valuable cues regarding individuals' vulnerability for repeat victimization. The present study aimed to investigate (1) the predictive validity of unstructured police information in the prediction of victim's risk for repeat victimization of violent crimes and (2) the incremental validity of unstructured police information over and above structured police information (*ProVict*).

Risk assessment in the police context

Over the last decades, specialized instruments to assist in decisions about risk assessment are increasingly being used by professionals in criminal justice systems (Storey et al., 2011). Different types of risk assessments can be distinguished: unstructured professional judgments, actuarial tools, and structured professional judgments (SPJ). Whereas unstructured professional judgments rely on the professional's clinical discretion, qualification, and experience regarding risk assessment, actuarial tools depend on characteristics that have been identified by statistical methods as predictors for a given outcome. SPJ approaches combine the actuarial approach with a clinical judgment approach (Kropp, 2004). For a long time, risk assessments have relied mainly on unstructured professional judgments. Several studies, however, demonstrated that risk assessments based on unstructured professional judgments had less predictive accuracy than actuarial tools and SPJ approaches (Petherick et al., 2021; Taxman et al., 2020). As a result, the focus in research and practice has shifted away from relying only on unstructured professional judgments toward actuarial tools and SPJ approaches. Examples of SPJ approaches that have been developed to classify high-risk victims by police officers are the Brief Spousal Assault Form for the Evaluation of Risk (B-SAFER; Kropp et al., 2005) and the Domestic Abuse, Stalking, and Honor Based Violence form (DASH; CAADA, 2012). Some studies suggest that SPJ approaches and actuarial tools achieve similar accuracy (Hanson et al.,

2007), however van der Put et al. (2019) demonstrated that actuarial tools outperformed SPJ approaches when predicting domestic violence.

An example of an actuarial tool is the Ontario Domestic Assault Risk Assessment (ODARA; Hilton et al., 2004). It was developed for police officers to assess the risk of domestic violence recidivism. Like the ODARA, other actuarial instruments often focus on specific outcomes such as domestic violence (Messing & Thaller, 2013; Svalin & Levander, 2020; van der Put et al., 2019) or do not directly predict repeat victimization, as they focus on the offender. The European Victim Directive requires an individual assessment for all victims of crime, Raaijmakers et al. (2022), therefore, developed an actuarial risk assessment tool that directly focuses on victims and their risk for repeat victimization of violent crimes. This instrument, called *ProVict*, is a collection of algorithms that calculate the risk of repeat victimization through an automatic procedure. To calculate a risk score, *ProVict* uses structured information from the police database pertaining to a victim's police contact history. Structured information is often classified as quantitative data: it fits a pre-defined data structure and is highly organized. In addition to structured information, the police database contains unstructured information in the form of police officers' notes, transcripts of interviews with offenders or witnesses, and victims' statements. Unstructured data, in general, consist of free-text forms and are often categorized as qualitative data, with no predefined structure or format.

Over 90% of all information available in official police records consists of unstructured data (Poelmans et al., 2010). Unstructured data in the form of written texts are considered to be the richest source of information for crime analysis. Extracting and collecting meaningful information from unstructured information is challenging as the process is complex and laborious when performed manually (Grimmer & Stewart, 2013). To solve this problem, text mining has been identified as a promising approach for crime analysis (Hassani et al., 2016). Text mining approaches automatically extract relevant information from unstructured information (Antons et al., 2020). To date, however, relatively few text mining approaches that use police information have been developed (Haleem et al., 2019). Examples of text mining approaches that have been applied to unstructured police information are attempts to identify domestic violence (Poelmans et al., 2010), potential jihadists (Elzinga et al., 2010), mentions of mental health disorders (Haleem et al., 2019; Karystianis et al., 2018), and abuse types conducted by offenders and

injuries sustained by victims (Karystianis et al., 2019). These studies suggest that text mining techniques can be used to extract information from unstructured police information, which may subsequently be used for the prediction of victims' risk of repeat victimization.

Repeat victimization has theoretically been explained by individual risk factors such as biological aspects (e.g., gender, physical vulnerability), risky lifestyles, (e.g., staying out late drinking), and occupation (e.g., working nightshifts) (Nagin & Paternoster, 2000). Furthermore, previous victimization experiences may lead to psychological distress, risky lifestyles, and substance use, which may increase the risk of repeat victimization (Gong, Kamboj, et al., 2019; López-Martínez et al., 2018; Rancher et al., 2019). Previous studies employing a text mining approach to police data identified individuals or incidents of interest by using custom-made dictionaries containing words related to these risk factors (Elzinga et al., 2010; Haleem et al., 2019; Karystianis et al., 2018, 2019, 2020; Poelmans et al., 2010). To our knowledge, no studies have used unstructured police information to assess a victim's risk of repeat victimization of violent crimes in general. As the group of repeat victims is highly heterogeneous (Obsuth et al., 2018), we employed an exploratory, data-driven, approach, meaning that we did not develop an a priori dictionary, but let the models reveal which words were related to repeat victimization.

Combining structured and unstructured data for risk assessment

Research has demonstrated the incremental value of unstructured information over structured information in the prediction of a wide range of topics. Combining unstructured and structured information improved the prediction of child abuse (Amrit et al., 2017), medication administration errors (Härkänen et al., 2020), suicide attempts (Adamou et al., 2018), use of health care services (Hatef et al., 2021), coronary artery disease (Jonagaddala et al., 2015), and drug treatment outcomes (Laar et al., 2020). With regard to risk assessment of repeat victimization based on official police records, to the best of our knowledge, the incremental value of unstructured police information over structured police information is not yet investigated. It is argued that structured and unstructured information both contain unique information (Verma & Maiti, 2018). We, therefore, expected that unstructured police information provides incremental validity over and above structured police information in the prediction of repeat victimization.

Present study

We proceeded in three steps. First, we investigated the validity of unstructured police information for predicting repeat victimization. Second, we assessed the incremental validity of risk scores based on unstructured police information over and above risk scores based solely on structured police information (*ProVict*). Third, we assessed the predictive accuracy (i.e., sensitivity and specificity) of risk scores for repeat victimization based on both unstructured and structured police information.

METHOD

Sample and design

Data were retrieved from the registration system used by the Dutch police. A random sample of individuals ($N = 150,000$) was drawn from all individuals registered by the Dutch police as a victim between July 1st, 2016 and June 30th, 2017. The last victimization incident in this period will be referred to as the index incident. Information on all police contacts across the 4 years *prior* to the index incident, as well as information on violent victimization incidents across the 2 years *after* the index incident was collected. Information on the 4 years *prior* to the index incident was used to predict victimization in the 2 years *after* the index incident. Individuals that had died within 2 years after the index incident, whose date of birth or gender was unknown were removed from the data, as this information is needed for the *ProVict* predictors. Individuals who had no police contacts in the 4 years prior to the index incident were also removed from the data as they had no unstructured police information. The anonymized dataset for analysis eventually contained 116,680 individuals. Victims were aged between 0 and 100 years ($M = 37.1$, $SD = 14.3$), 46% was female and 54% was male. The total dataset was randomly split into a training set ($n = 58,461$) and a test set ($n = 58,219$). Models were developed on the training set and validated on the test set.

Measures

Repeat victimization

We distinguished two types of violent crimes: severe and less severe violent crimes. According to the definition used by the Dutch police, severe violent crimes include crimes such as sexual assault and human

trafficking. Victims of these severe violent crimes are believed to have an elevated risk of repeat victimization, secondary victimization, intimidation, and retaliation. We also focused on less severe violent crimes. Examples of less severe violent crimes are threat and violent theft. Both outcome variables were operationalized as dichotomous variables indicating whether or not a victim had experienced victimization of a severe and less severe violent crime, respectively, within 2 years after the index incident.

Textual reports

Textual reports that were created across 4 years prior to the index incident were retrieved from the police system. These textual reports included, for example, investigator notes, transcripts of interviews with offenders or witnesses, and victims' statements. When individuals who come into contact with the police do not speak Dutch, an interpreter is provided. Textual reports are, therefore, always in Dutch. Per victim, all textual reports were concatenated. In other words, for each victim all texts were added together, resulting in one overarching document per victim. To improve the efficiency of this process, stop words (commonly occurring terms that are uninformative) were removed from these documents.

Next, textual data in the overarching documents were transformed into numeric features to obtain predictor variables. For this purpose, two data processing strategies were applied: count-vector and TF/IDF (term frequency/inverse document frequency). The count-vector procedure replaced a text with a vector (list) of integer counts. Across victims, the vector elements represented the same words. Each element of the vector represented a word in the text and the number of times that word occurred in the text (term frequency). In the TF/IDF procedure, which is related to the count-vector procedure, the term frequencies were weighted by the inverse document frequency. This is a measure indicating how common a word was across documents, or across victims as each victim had one overarching document. Frequently occurring words across all victims thus received lower weights than less frequently words across all victims, as frequently occurring words are not necessarily the most relevant words. When a word appears many times in one document (e.g., one victim), while not appearing many times in other documents (victims), it is arguably more relevant for that specific victim than words that appear many times across all victims.

To restrict the length of the vector, in both procedures, only the 10,000 most commonly occurring words were vectorized. To improve efficiency of the process, the 2,000 most distinguishing words were selected as model building features. These words were selected using a chi-square selection algorithm.

Analyses

Model building

For each outcome (severe and less severe violent crimes), the objective was to use unstructured information to build a classification model which optimally allocates victims to the correct categories (high- and low-risk) based on the variables yielded from their overarching documents. Classification models can be built using several methods of analysis. Previous studies argued to replace traditional regression models with decision tree or random forest models (Berk, 2021; Berk & Sorenson, 2020; Lussier et al., 2019; Ngo et al., 2015, 2018). In this study, two analytical procedures were considered: decision tree and random forest. It is argued that decision tree and random forest models are suitable models for analysing rare events, such as repeat victimization of severe and less severe violent crimes, since these models have no assumptions for distributions (Hegelich, 2016).

Decision trees

A decision tree model iteratively splits a dataset into a sequence of nested smaller groups based on the best distinguishing feature in relation to the target variable (i.e., repeat victimization). The first split into two groups starts with the strongest distinguishing feature, the next split selects the best distinguishing feature for each separate group (branch), and so on. This results in a reverse tree-like model representation. The main advantage of a decision tree model is its easy interpretation. Disadvantages include a lack of robustness, that is, small changes in the data may cause significant changes in the model and hence its predictions. Moreover, decision tree models may be prone to overfitting (Hegelich, 2016), implying that an excellent model fit to the training set will not generalize to the test set. In this study, a decision tree with a maximum depth of 10 nodes was developed.

Random forest

A random forest is an ensemble of decision trees. Sub-trees were constructed using a random subset of the records in the training set, as

well as a random subset of the features. We used random forest with 25 trees with a maximum depth of 10 nodes. After training these sub-trees, a final risk score was calculated by averaging the predictions of the 25 individual decision trees.

Predictive validity unstructured data models

Both decision tree and random forest models resulted in a risk score (ranging from 0 to 1) that reflects the chance of repeat victimization for each victim. This risk score was based on the textual reports (unstructured information) that were transformed into numeric features using count-vector and TF/IDF procedures. In sum, four models for each outcome variable were estimated using two data processing strategies (count-vector and TF/IDF) combined with two classification procedures (decision tree and random forest). These models were evaluated with regard to the Area Under the Curve (AUC), obtained by Receiver Operator Characteristics (ROC) analysis. In the present context, AUC values reflect the probability that a randomly selected repeat victim has a higher risk score than a randomly selected non-repeat victim. The AUC value is one of the most well-known and widely used indicators to assess a model's predictive validity (Messing & Thaller, 2013; Rice & Harris, 2005). According to rules of thumb proposed by Hosmer and Lemeshow (2000), AUC values between .60 and .70, between .70 and .80, and between .80 and .90, reflect moderate, acceptable, and excellent accuracy, respectively. According to Rice and Harris (2005), AUC values of .56, .64, and .71 correspond with small, medium, and large effect sizes, respectively. Based on the AUC, a final model based on unstructured information for severe violent crimes and a final model for less severe violent crimes was selected for subsequent analysis.

ProVict

To investigate the incremental validity of unstructured information over structured information (*ProVict*) in the prediction of repeat victimization, *ProVict* models for severe and less severe violent crimes were applied to the victims in this study. For this purpose, information regarding all predictors in *ProVict* was collected across the 4 years prior to the index incident. For a detailed description of *ProVict*, including predictors and associated weights, see Raaijmakers et al. (2022). By applying the *ProVict* algorithms for severe and less severe violent crimes, two risk scores that reflect the chance of repeat victimization of a severe and less severe violent crime, respectively, were calculated for the victims in this study.

Incremental validity

The incremental validity of unstructured information over structured police information in predicting repeat victimization was assessed with hierarchical logistic regression analyses. *ProVict* risk scores (based on structured information) and risk scores based on unstructured information were entered successively into the logistic regression model. Likelihood-ratio tests were performed to compare the successive models. Given our large dataset (test set: $n = 58,219$), we used a conservative approach and considered results significant when $p < .001$.

Model combination methods and evaluation

After examining the incremental validity of unstructured information over structured information, risk scores based on structured (*ProVict*), and unstructured information (final model) were combined to create a combination risk score. Following previous studies (Lehmann et al., 2013; Seto, 2005), several combination methods were used. These methods can be divided into two categories: intuitively appealing rules and statistical optimization methods. We applied three intuitively appealing rules: believe-the-negative, believe-the-positive, and averaging. The believe-the-negative approach implied that the lowest risk score was leading, whereas the believe-the-positive approach implied that the highest risk score was leading. The averaging approach implied that a new risk score was obtained by calculating the average of both risk scores. Two statistical optimization methods were used to combine the risk scores based on structured and unstructured information. First, both risk scores were entered in a logistic regression model to obtain the predicted probabilities based on both structured and unstructured information. Second, to account for the possibility that the effect of one risk score on repeat victimization depended on the other risk score, both risk scores and their interaction term were entered in a second logistic regression model in order to obtain these predicted probabilities.

The predictive validity of different combination methods was evaluated on the basis of their respective AUC values. Subsequently, the following predictive validity indicators were calculated for the best combination model: sensitivity, specificity, positive predictive value (PPV), and negative predictive value (NPV). Discrimination indicators such as sensitivity and specificity reflect to what extent high- versus low-risk groups can be separated. Sensitivity refers to the proportion of repeat victims classified as high-risk, whereas specificity refers to the proportion of non-repeat victims classified as low-risk. In other words,

sensitivity reflects the percentage of true-positives, whereas specificity reflects the percentage of true-negatives the calibration indicators such as the PPV and the NPV reflect to what extent the expected classification resembles the observed classification. The PPV indicates the proportion of high-risk victims who experience repeat victimization and the NPV indicates the proportion of low-risk victims who do not experience repeat victimization (Singh, 2013).

The predictive validity indicators mentioned above rely on the chosen cut-off threshold for distinguishing high-risk victims from low-risk victims. To investigate the consequences of using different thresholds, the test set was divided into 10 equal groups (deciles) based on individuals' risk scores. For each decile, a risk score that represents the cut-off threshold was calculated. Individuals with risk scores lower than this cut-off threshold were considered to be low-risk and individuals with risk scores higher than or equal to the cut-off threshold were considered to be high-risk. Sensitivity, specificity, PPV, and NPV were calculated for these 10 cut-off thresholds.

The PPV and NPV rely heavily on the distribution of the outcome variable, in this study, repeat victimization. Helmus and Babchishin (2017), therefore, argued that indicators such as the PPV and NPV do not adequately reflect a model's predictive accuracy, as they provide more information on the base rate of the outcome variable than model itself. These indicators do, however, provide relevant insights on the practical implications of different cut-off thresholds for distinguishing high- from low-risk victims.

RESULTS

Descriptive results

Repeat victimization of a severe violent crime within 2 years after the index incident was experienced by 0.9% of the victims. Repeat Victimization of a less severe violent crime within 2 years *after* the index incident was experienced by 2.0% of the victims.

Evaluation of the unstructured data models

Table 1 shows the AUC values for all models based on unstructured information for both severe and less severe violent crimes. AUC values ranged from .74 to .80 for severe violent crimes and from .70 to .76.

For less severe violent crimes, indicating acceptable to excellent discrimination and medium to large effect sizes for all models. The count–vector random forest (CV–RF) models produced the highest AUC values for both outcome variables, although the AUC values differed slightly. Hence, the count–vector random forest model resulted in the best model for risk assessment of repeat victimization based on unstructured data. Therefore, this model was selected for subsequent analyses. From the 2,000 most distinguishing words that were selected as model building features, the CV–RF model for severe violent crimes resulted in 1,111 significant features (i.e., words). The CV–RF model for less severe violent crimes resulted in 1,801 significant words. As we employed a data–driven approach, not all words were clearly interpretable in relation to an elevated risk of repeat victimization. However, some words did reflect aspects of known risk factors for repeat victimization described in the literature. For instance, for both severe violent and less severe violent crimes, several words were related to substance use (e.g., alcohol, beer, addicted, weed), psychological distress (anxious, to cry, stress, angry, aggressive), or family connections (daughter, relation, child, (ex) boyfriend, spouse).

Table 1. AUC values models based on unstructured information

	AUC (95% CI)	
	Severe violent crimes	Less severe violent crimes
Count–vector decision tree	.74 [0.71, 0.76]	.70 [0.69, 0.72]
Count–vector random forest	.80 [0.78, 0.82]	.76 [0.75, 0.77]
TF/IDF decision tree	.74 [0.71, 0.76]	.71 [0.70, 0.73]
TF/IDF random forest	.79 [0.77, 0.81]	.76 [0.74, 0.77]

Note. n = 58,219. AUC = area under the curve; CI = confidence interval.

Incremental validity

Correlations between CV–RF risk scores and *ProVict* risk scores indicated a weak and moderate association, respectively, for severe violent crimes ($r[58,217] = .30, p < .001$) and less severe violent crimes ($r[58,217] = .42, p < .001$). Table 2 shows the results of models with only *ProVict* risk scores as predictor (Model 1) and models with both *ProVict* and CV–RF risk scores as predictors (Model 2). For both severe and less severe violent crimes, *ProVict* and CV–RF scores were significantly associated with the likelihood of repeat victimization. Likelihood ratio tests were significant, indicating that the goodness of fit of the models improved significantly when adding the CV–RF scores.

Table 2. Hierarchical logistic regression models for severe and less severe violent crimes

	Severe violent crimes			Less severe violent crimes		
	Model 1	Model 2		Model 1	Model 2	
	OR	SE	OR	SE	OR	SE
Constant	0.01***	0.05	0.01***	0.05	0.02***	0.03
<i>ProVict</i> risk score	96.64***	0.34	19.71***	0.40	240.89***	0.23
CV-RF risk score ¹			1.15***	0.01		
Likelihood ratio	5,831.95		5,718.57		12,167.79	
Δ Likelihood ratio		113.38***			309.73***	

Note. n = 58,219. ¹Risk scores were multiplied by 100 to facilitate interpretation of the odds ratios. ***p < .001.

Evaluation of the combination models

Table 3 presents the AUC values for the different methods that combined *ProVict* risk scores and CV-RF risk scores. These combination methods yielded accurate models ($AUC > .70$) for both outcomes. For both severe and less severe violent crimes, combining two risk scores using statistical optimization methods resulted in higher AUC values than the intuitively appealing rules, although differences were small. Consequently, risk scores produced by a logistic regression analysis with both risk scores and the interaction term as independent variables showed the highest AUC values. The AUC value for severe violent crimes was higher than .80, indicating excellent discrimination and a large effect size. The AUC value for less severe violent crimes indicated acceptable discrimination and a large effect size, as the AUC value was higher than .70.

Additional predictive validity indicators for the best combination method (logistic regression with interaction term) for severe violent crimes are presented in Table 4. These indicators illustrate how a risk assessment instrument based on structured and unstructured information can perform in practice, when applying different thresholds to distinguish between high- and low-risk victims. Table 4 indicates the typical trade-off between sensitivity and specificity; the higher the cut-off threshold, the fewer repeat victims are classified as high-risk (lower sensitivity), the more non-repeat victims are classified as low-risk (higher specificity). The PPV indicates that only a small proportion of high-risk victims are repeat victims, while the NPV indicates that a large proportion of low-risk victims do not experience repeat victimization. Similar indicators were found for repeat victimization of less severe violent crimes.

Table 3. AUC values combinations models based on *ProVict* and CV-RF risk scores

	AUC (95% CI)	
	Severe violent crimes	Less severe violent crimes
Believe-the-negative	.78 [0.76, 0.80]	.76 [0.74, 0.77]
Believe-the-positive	.80 [0.78, 0.82]	.76 [0.75, 0.78]
Averaging	.81 [0.79, 0.83]	.77 [0.76, 0.78]
Logistic regression	.81 [0.79, 0.83]	.77 [0.76, 0.79]
Logistic regression + interaction term	.81 [0.80, 0.83]	.77 [0.76, 0.79]

Note. n = 58,219. AUC = area under the curve; CI = confidence interval.

Table 4. Predictive validity indicators best combination method severe violent crimes

Cut-off thresholds	Sensitivity (%)	Specificiteit (%)	PPV (%)	NPV (%)
Top 100%	100.0	0.0	0.9	0.0
Top 90%	98.8	10.1	1.0	99.9
Top 80%	97.5	20.2	1.1	99.9
Top 70%	95.4	29.8	1.2	99.9
Top 60%	92.9	40.3	1.4	99.8
Top 50%	90.4	50.4	1.6	99.8
Top 40%	85.4	60.4	1.9	99.8
Top 30%	78.6	70.4	2.3	99.7
Top 20%	67.4	80.4	3.0	99.6
Top 10%	47.0	90.3	4.2	99.5

Note. n = 58,219. PPV = positive predictive value; NPV = negative predictive value.

DISCUSSION

Following the Victim Directive, Dutch police officers are required to assess a victim's vulnerability to repeat victimization. When victims are considered vulnerable (to repeat victimization), protection measures can be applied. Examples of protection measures are protection orders, shielding the victim's name or address from the police report, audio-visually recording the victim's interview, and referral to victim support services. As police officers have limited time and capacity, it is important that police officers correctly estimate the risk of repeat victimization and identify victims that are at-risk for repeat victimization. Moreover, it is important to correctly identify and protect repeat victims, as a small number of victims account for a large proportion of all victimization incidents (Gabor & Mata, 2004; SooHyun et al., 2017), and because the impact of victimization on an individual is often immense (Jackson & Gouseti, 2016). As a result, limited time and resources can be targeted at these high-risk victims. Identifying high-risk victims, however, is challenging as victims are a heterogenous group, with a great variety in frequency and severity of subsequent victimization incidents (Hope & Norris, 2013; Obsuth et al., 2018).

To guide police officers in the assessment of vulnerable victims, Raaijmakers et al. (2022) developed *ProVict*: an actuarial risk assessment tool that automatically calculates the risk of repeat victimization for

victims that report a crime to the police. *ProVict* only used structured information from official police records. This study investigated the utility of unstructured police information for the prediction of repeat victimization, as well as its incremental value over and above structured police information. Finally, predictive accuracy of risk scores based on both unstructured and structured police information was assessed.

Firstly, unstructured police information showed predictive validity for the prediction of repeat victimization. For both severe and less severe violent crimes, AUC values indicated large effect sizes following Rice and Harris (2005) and acceptable and excellent discrimination following Hosmer and Lemeshow (2000). Secondly, in line with studies in other research areas (Adamou et al., 2018; Amrit et al., 2017; Härkänen et al., 2020; Hatef et al., 2021; Jonnagaddala et al., 2015; Laar et al., 2020), our findings suggest that unstructured information provides incremental validity over and above structured information in the prediction of repeat victimization. The goodness of fit improved when risk scores based on unstructured and risk scores based on structured information were included, compared to when only risk scores based on structured information were included. We conclude that structured and unstructured police information both contain unique information (Verma & Maiti, 2018) and incrementally contribute to the prediction of repeat victimization. However, the predictors of repeat victimization derived from unstructured and structured information, respectively, also showed some overlap. For example, significant *ProVict* predictors referred to missing person, assault, and threat cases, whereas significant words yielded from the CV-RF model were “missing person,” “assault,” “threat,” and synonyms of these words. Although we conclude that structured and unstructured police information contain unique information, some overlap is also present. Thirdly, AUC values of models based on a combination of both unstructured and structured information indicated large effect sizes (Rice & Harris, 2005) and excellent discrimination regarding severe violent crimes and acceptable discrimination regarding less severe violent crimes (Hosmer & Lemeshow, 2000). Discrimination indicators showed that models based on both unstructured and structured information were able to distinguish well between high- and low-risk victims. Across several cut-off thresholds (e.g., top 40%, top 30%, top 20%), a majority of the repeat victims and non-repeat victims was correctly classified as high- and low-risk, respectively.

A point of discussion concerns the method used for data processing of unstructured information. In the present study, two methods were used: count-vector and TF/IDF. Both methods do not capture semantic similarities between words (Qaiser & Ali, 2018). Future studies could, therefore, explore methods that do capture these semantic similarities, such as Word2Vec. Moreover, we used decision tree and random forest models as these approaches are suitable for analysing rare events (Hegelich, 2016), such as repeat victimization. Berk and Sorenson (2020) recently applied three alternative algorithms for forecasting rare events. Future studies could investigate to what extent these alternative algorithms can successfully be applied to the prediction of repeat victimization. Future studies could also distinguish between different sources of unstructured police information (e.g., victims' statements and police officers' notes) and investigate whether these sources vary in their predictive validity regarding repeat victimization.

Finally, this study used official police records to facilitate the implementation of an instrument that predicts repeat victimization in Dutch police practice. The use of information that is already available by Dutch police is preferred over external information, as it simplifies the implementation of a risk assessment instrument. However, not all relevant information regarding risk factors for repeat victimization may be contained within official police records. In line with previous research, this study showed that words related to substance use, psychological distress, and family connections were associated with an increased risk of repeat victimization use (Gong, Kamboj, et al., 2019; Lawyer et al., 2006; López-Martínez et al., 2018; Rancher et al., 2019). To develop more knowledge on the risk factors of repeat victimization, future studies could focus on unstructured police information to identify other risk factors and explore whether information on these risk factors could, for example, be collected through an additional questionnaire. This study, however, focused on the development of an actuarial risk assessment instrument that can aid police officers in targeting their limited time and capacity to victims most at-risk of repeat victimization. This risk assessment instrument is based solely on structured and unstructured information from the police database, using no other data sources. This enabled an automated assessment of the risk of repeat victimization without any manual labour from police officers.

Based on our findings, we conclude that the combination of unstructured and structured police information may be a promising approach for risk

assessment of repeat victimization within Dutch police. We conclude that a risk assessment instrument based on both structured and unstructured information provides more accurate predictions than a risk assessment instrument based solely on structured information (Raaijmakers et al., 2020). Such a risk assessment instrument may support police officers in their individual assessment of victims, by pointing out vulnerability to repeat victimization and indicating that for those victims further attention is needed. Such an instrument may also enable police officers to target their limited resources toward those victims that are most at-risk. Note that such an instrument is not intended to replace a police officer's assessment, but is merely used to assist police officers.

For successful implementation, additional research is needed to explore practical possibilities or limitations of this risk assessment instrument in Dutch police practice. An investigation of the costs and benefits associated with the choice for different cut-off threshold should be part of such an investigation. As stated above, sensitivity and specificity values showed that across several cut-off threshold, a majority of repeat victims and non-repeat victims were correctly identified as high-risk and low-risk, respectively. At the same time, however, calibration indicators indicated that when applying these thresholds, a large number of high-risk victims do not experience repeat victimization (false-positives). These calibration indicators should be taken into account in cost/benefit analyses. It could be argued that correctly classifying a large number of repeat victims as high-risk outweighs the costs of classifying a certain number of non-repeat victims as high-risk. Note, that the relatively large numbers of false-positives are inevitable due to the low base rate of repeat victimization of (less) severe violent crimes. Note also, that not all false-positives in the present study may be non-repeat victims, as not all repeat victims may have reported their revictimization to the police. Previous studies showed that victims are less willing to report revictimization to the police, when previous police experiences were evaluated negatively (Colin Bolger & Walters, 2019; Koster, 2017).

To combine risk scores based on unstructured and structured information, this study removed individuals who had no police contact prior to the index incident from the data. When a risk assessment instrument for repeat victimization based on both structured and unstructured police information is considered for implementation, analyses that include persons who had no prior police contact should be executed. In practice, the instrument aimed to be used for all victims regardless of the presence

of prior police contacts. Future research should address predictive validity when all victims are included.

This study demonstrated that unstructured police information may be a valuable addition to the risk assessment instrument *ProVict* (Raaijmakers et al., 2022). Our analyses revealed that a risk instrument using both types of data correctly classified a majority of repeat and non-repeat victims. In police practice, such an instrument may contribute to the identification of victims with an elevated risk of repeat victimization. Repeat victimization and its consequences may subsequently be prevented through applying adequate protection measures targeting these at-risk individuals.

Chapter 5

Under- and over-protection in
vulnerability assessments used
by the police

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ABSTRACT

Victim vulnerability assessment instruments applied by the police face significant challenges in accurately identifying vulnerable victims and offering adequate protection measures. This paper comprehensively analyses five key shortcomings and demonstrates how all of these may contribute to the risks of under- and over-protection. Drawing on theoretical perspectives on vulnerability and empirical studies of vulnerability assessments and police-victim interactions, this paper highlights how under-protection can result from narrow definitions of vulnerability, biases, and inadequate assessments of protection needs. Over-protection may result from overlooking resilience and excessive implementation of protection measures for victims with minimal or no protection needs. This paper aims to raise awareness among researchers and policymakers about these issues and proposes improvements of the instruments themselves and the way they are monitored. It also proposes several attainable solutions that may reduce the risks of under- and over-protection, ultimately improving the accuracy and effectiveness of vulnerability assessments in policing.

INTRODUCTION

In the past decade, European Union (EU) member states have increasingly introduced vulnerability assessment tools to help frontline police officers identify and protect vulnerable victims (Ivankovic et al., 2019; Pavlou et al., 2019; van der Put et al., 2019). Consequently, officers conduct Individual Assessments, in some cases supported by risk assessment instruments. The Individual Assessment is based on Article 22 of the EU Victims' Directive (European Parliament, 2012), which requires that victims receive a timely assessment of their vulnerability. Articles 18 and 23 of the Directive outline measures that should be taken to protect victims, such as enhanced surveillance, specialized interview protocols and courtroom accommodations. In addition, officers may use risk assessment instruments to assess the risk of repeat victimization for specific types of crimes, such as Intimate Partner Violence (IPV) and stalking (Hehemann et al., 2017; van der Put et al., 2019). These instruments often include a list of possible risk management strategies officers can apply to reduce the risk of repeat victimization (Pavlou et al., 2019).

In practice, several shortcomings occur concerning the identification of vulnerable victims and their protection needs. These stem from issues in the design of assessments on one hand and their practical use on the other. Previous studies have addressed these shortcomings in isolation, whereas better understanding requires the examination of these collectively. More importantly, previous studies gave little attention to the overarching issue these shortcomings may result in the risk of either under- or over-protection of vulnerable victims. This paper, therefore, advances earlier research in two steps. First, it discusses five major shortcomings related to the design and the practical use of the assessments together: (1) a fragmented conceptualization of vulnerability in assessment instruments (Bartkowiak-Théron & Asquith, 2012, 2017; Enang et al., 2019; Van der Aa, 2016); (2) police officers who perform assessments often have limited understanding of the broader concept of vulnerability (Robinson et al., 2016, 2018); (3) police officers may fail to identify certain types of vulnerable victim due to biases and expectations (Ask, 2010; Franklin et al., 2020; St George et al., 2021); (4) police officers may incorrectly override assessment outcomes (Orton et al., 2020); and (5) mismatches occur between victims' protection needs and police responses (Meyer and Reeves, 2021; ten Boom, 2022; Villacampa & Salat, 2019).

Second, by drawing on empirical studies of vulnerability assessment practices and police–victim interactions, alongside theoretical work on victim vulnerability, this paper addresses how the five key shortcomings all may result in the overarching issue of the risk of either under- or overprotecting vulnerable victims. Under-protection occurs when victims who need protection are misclassified as non-vulnerable and/or when the police fail to take appropriate protection measures, leaving victims exposed to further harm (Aihio et al., 2017; Enang et al., 2019; Franklin et al., 2020). Over-protection occurs when victims who have minimal or no protection needs are yet identified as vulnerable and receive (excessive) protection measures, leading to stigmatization and straining of limited police resources (Gilson, 2016; Peroni & Timmer, 2013; Verza, 2022; Walklate, 2011). Options to empirically measure the extent to which these misclassifications occur are limited because no objective baseline exists which allows to determine victims' protection needs. This paper, therefore, examines under- and over-protection at its most extreme ends, for instance, when no measures are taken for victims with clear protection needs or conversely, when extensive measures are taken for victims with minimal needs. In other words, this paper focusses on cases in which misclassifications have the most serious impact, affecting both vulnerable and non-vulnerable victims. The paper aims to raise awareness among researchers and policymakers and calls for enhancing the effectiveness of vulnerability assessments and, ultimately, to promote adequate protection of victims and efficient use of police resources.

The structure of the paper is as follows: first, it explores the concept of identifying vulnerability through assessment instruments, followed by an overview of how the police use Individual Assessments and risk assessment instruments to evaluate vulnerability. Second, it demonstrates how the risk of under- and over-protection relates to five specific shortcomings of assessments. Third, this paper discusses the challenges for policymaking and future research, suggesting several avenues that could be explored.

Identifying victim vulnerability through assessment instruments

Vulnerability is a highly heterogeneous concept with varying meanings and indicators to establish its presence (Brown et al., 2017). The most prominent meanings of vulnerability after victimization relate to an elevated risk of revictimization or to the harm resulting from the experience of victimization (Keay & Kirby, 2017; Skidmore et al., 2020;

Walklate, 2011). Indicators are commonly grouped into three broad categories: victim characteristics, the type of crime and the context in which victimization occurs (Innes and Innes, 2013). Although a single indicator may suggest vulnerability, it may also follow from the interaction between different indicators, which illustrates the dynamic and layered nature of the concept (Bartkowiak-Théron & Asquith, 2015; Luna & Vanderpoel, 2013; Verza, 2022).

Some studies view vulnerability as an inherent human condition (Fineman, 2008; Verza, 2022), while others link it to specific individuals or groups with particular characteristics (Enang et al., 2019; Peroni & Timmer, 2013; Skidmore et al., 2020; Verza, 2022). Police assessment instruments adopt the latter approach and use predefined indicators and meanings of vulnerability to allow police officers to distinguish vulnerable from non-vulnerable victims and determine which protection measures, and which type, should be taken. Predefined indicators help officers in knowing which victim groups to target, while the predefined meaning helps officers determine the type of protection measures required. For example, preventing repeat victimization may require other measures than helping victims to deal with harm caused by the initial victimization. Most assessments focus on preventing repeat victimization and therefore focus on measures aimed specifically at this goal rather than at the harm victims have experienced.

As mentioned above, the police assess victim vulnerability through what is called Individual Assessment, in some cases supported by risk assessment instruments. Next, I briefly describe the design of these tools. Police officers conduct these assessments when a victim reports a crime or during initial victim-police contacts in incidents.

Individual Assessment

The Individual Assessment follows a two-step process. First, police officers identify vulnerability, in terms of the victim's risk of repeat victimization, including retaliation and intimidation, as well as potential secondary victimization by the criminal justice system. The assessment is often based on a checklist comprised of indicators. Specific indicators may vary per member state, but they can roughly be distinguished into three categories: victim characteristics, the type and nature of the crime and the circumstances in which it took place (Ivankovic et al., 2019). Victims of human trafficking, gender-based violence, IPV, sexual violence, and hate crimes receive special attention in the Victims' Directive. The EU

has not prescribed a uniform checklist and consequently indicators differ between Member States (Ivankovic et al., 2019). A victim is considered vulnerable if the presence of at least one indicator is established.

In the second step, officers assess specific protection needs and then implement appropriate measures in consultation with the victim. Measures may be taken to prevent future victimization and protect the physical and psychological integrity of the victim, such as imposing a restraining order, providing shelter for victims of domestic abuse, or reference to specialized victim support services (Ivankovic et al., 2019). In addition, protection measures may be necessary to prevent secondary victimization, for instance during the criminal investigation or court proceedings, such as that interviews be conducted by specially trained personnel or preventing visual contact between the victim and suspect in court. Police officers are encouraged to discuss potential measures with individual victims and allow them to express their wishes and respect these even if they refuse specific protection measures offered to them.

Risk assessment instruments

Several countries have developed risk assessment instruments to support frontline officers particularly regarding the risk of repeat victimization for specific crimes, such as IPV and stalking (e.g. Hehemann et al., 2017; Pavlou et al., 2019; van der Put et al., 2019). These instruments may complement the Individual Assessment (Pavlou et al., 2019). Examples of risk assessment instruments currently integrated into police practice include B-SAFER in Sweden (Kropp & Hart, 2004), SASH in the Netherlands (Hehemann et al., 2017), and DASH in the United Kingdom (CAADA, 2012).

Risk assessment instruments also follow a two-step process in which officers first fill in a questionnaire with vulnerability indicators which allows them to calculate the risk of repeat victimization and second to propose appropriate responses. These questionnaires are again based on indicators grouped into victim characteristics, the type of crime, and the circumstances in which it took place (e.g. CAADA, 2012; Hehemann et al., 2017; Kropp & Hart, 2004; Pavlou et al., 2019). Officers determine whether indicators are present, absent or unknown through questioning or observations. The outcome is usually classified as a high, medium or low risk. A higher risk logically implies a higher need for advising protection measures.

Next, police officers assess victims' protection needs and recommend, based on their own judgement, risk management strategies from a predefined list of measures aimed at preventing repeat victimization. Four types of strategies exist: monitoring, treatment, supervision, and victim safety planning (Belfrage et al., 2012; Kropp & Hart, 2004; Pavlou et al., 2019). Monitoring entails keeping in regular contact with victims or their support networks. Supervision means imposing restrictions on suspects' movements or activities to prevent further harm. Treatment focuses on treating the suspects, typically through referrals to healthcare or social services. Victim safety planning aims to enhance security and promote empowerment of victims after victimization. Finally, victims could also be referred to multi-agency safeguarding hubs (Enang et al., 2021; Robbins et al., 2014).

UNDER- AND OVER-PROTECTION OF VICTIMS IN FIVE KEY SHORTCOMINGS

The current section argues in more detail how shortcomings in vulnerability assessments may contribute to the overarching issue of the risk of under- and over-protecting victims. It draws on academic literature comprising theoretical work on victim vulnerability alongside empirical studies of vulnerability assessment practices and police-victim interactions. The empirical work used here comprised quantitative studies drawing on surveys, police files or completed assessments; qualitative studies based on interviews with professionals and victims; and systematic reviews/meta-analyses. Most of these studies were conducted in a European context.

Fragmented understanding of vulnerability

The conceptualization of vulnerability in questionnaires and checklists used by police officers to perform assessments may increase the risk of under- and over-protection. Empirical studies on assessment designs suggest these lists are inherently limited to a fixed set of indicators, which may result in an incomplete review of vulnerability (Bartkowiak-Théron & Asquith, 2012, 2017; Enang et al., 2019, 2021; Skidmore et al., 2020). Both the Individual Assessment and risk assessment instruments focus mainly on incident-related indicators, such as the type of crime, use of violence, and a discriminatory motive (CAADA, 2012; Hehemann et al., 2017; Kebbell, 2019; Van der Aa, 2016). This focus narrows the full spectrum of vulnerability and implicitly deprioritizes other types of

indicators, such as victim characteristics. As a result, assessments may overlook vulnerabilities not included as indicators, potentially leading to the under-protection of victims in need of protection.

Focussing on specific indicators may also lead to over-protection, as checklists may label all individuals of a certain crime as vulnerable and in need of protection measures. However, not all victims who meet these criteria are vulnerable and/or require protection. Misclassifying non vulnerable victims can be problematic, since it may undermine victims' autonomy and reinforce stigmatization and patronization (Gilson, 2016; Peroni & Timmer, 2013; Verza, 2022), as well as disrupt natural coping mechanisms, potentially leading to the over-protecting of victims.

The Individual Assessment and risk assessment instruments also emphasize specific meanings of vulnerability, shaping what victims are protected from. Both primarily address the risk of repeat victimization and consequently focus on protection measures mainly aimed at preventing future victimization. However, other meanings of the concept, such as the immediate harm caused by the victimization-incident are overlooked (Keay & Kirby, 2017; Skidmore et al., 2020; Walklate, 2011).

Potential solutions

Prioritizing specific indicators and meanings in the design of assessment instruments reflects the dilemma for police departments between conducting these assessments efficiently and in a way that fits police practice, while at the same time preventing victims' needs being overlooked. Although on one hand, predefined indicators and meanings assist police officers in identifying vulnerable victims and determining appropriate protection measures (Keay & Kirby, 2017), on the other hand the checklists do not fully capture the heterogeneity of the concept of vulnerability (Bartkowiak-Théron & Asquith, 2012; Brown et al., 2017). Incorporating open fields in the questionnaires, such as used in B-SAFER (Svalin et al., 2018), may encourage officers to also consider unlisted indicators. However, this may only be relevant to specialized, non-first responder officers, as open-text fields are often incomplete or inconsistent in frontline contexts (Myhill et al., 2023). Regular review of which indicators officers add in the open-text fields could reveal gaps in the assessment designs and allow additional indicators (Saxton et al., 2020). Existing or newly developed training programmes for police officers on risk assessments could, if not already included, devote specific attention to recognizing indicators of resilience, autonomy, and

empowerment among victims. This could mitigate the risk of over-protection by helping officers. Finally, monitoring victim satisfaction with the outcomes of the assessment procedure could lead to improvements. All of these strategies may help to better identify overlooked, and thereby under-protected victims, and prevent over-protection of specific victim, as well as improvements in officer training.

Police officers' narrow focus of vulnerability

Interviewing victims who report a crime is complex and requires officers to balance two key roles: a judicial role focused on evidence, questioning and legal procedures, and a victim support role centred on protection and welfare (Rumney & Mcphee, 2023; Saxton et al., 2020). This dual purpose, however, complicates assessments, because comprehensive gathering of information on vulnerabilities and protection needs is often constrained by lack of time. This too, may lead to under-protection of victims. Empirical studies on officers' application of vulnerability assessments reveal that they often use only a subset of indicators on the predefined lists (Kebbell, 2022; Raaijmakers et al., 2024; Robinson et al., 2016, 2018; Turner et al., 2019). These indicators often are closely tied to the incident, for example, whether violence was used or the suspect threatened to use a weapon. Analyses of filled-out questionnaires shows that police officers mostly take these factors into account, as they are most easily observed when filling out the questionnaires (Barlow & Walklate, 2021; Kebbell, 2022; Robinson et al., 2018; Turner et al., 2019). Other, less apparent, indicators are more often marked as 'unknown', which excludes them from the risk assessment. Consequently, latent indicators, such as victim experiences of non-violent abuse or mental health problems, are potentially overlooked and under-protected (Aspinall et al., 2024; Kebbell, 2022; Robinson et al., 2016). Partial use of lists of indicators, which as the previous section has shown are incomplete to begin with, may exacerbate the risk that vulnerabilities and protection needs are not identified, increasing the risk of under-protection (Keay & Kirby, 2017; Robinson et al., 2018; Skidmore et al., 2020; Van der Aa, 2016).

Potential solutions

Raising awareness of latent vulnerability indicators and training officers to be responsive to those factors, could promote more comprehensive use of checklists included in assessments, and thereby potentially reduce the risk of under-protection (Franklin et al., 2020). Automated assessment tools for identification of the risk of repeat victimization, such as *ProVict* (Geurts et al., 2021; Raaijmakers et al., 2022), could also point police

officers at latent indicators, such as prior police contacts (Kebbell, 2019; Turner et al., 2022). Adjusting questionnaire items can also help officers identify latent indicators and improve the accuracy and consistency of assessments. For example, the Domestic Abuse Risk Assessment (DARA), an update of DASH, was developed to improve the identification of non-violent domestic abuse, such as coercive control, specifically in frontline contexts (College of Policing, 2022). Compared to DASH, DARA uses fewer items, includes scaled response options rather than yes/no questions and reduces reliance on open texts. A pilot study indicated that officers identified coercive control more often and made more appropriate assessments (Wire & Myhill, 2018).

The development of DARA addresses a key constraint in frontline contexts: time. Due to limited timeframes, officers may be unable to obtain an in-depth picture of all relevant indicators. Specifying the key indicators that officers are most likely to identify in daily practice, such as incident-related indicators, may therefore be crucial. Other agencies, such as victim support services or health professionals operating in multi-agency hubs, can offer specialized expertise which allows to more easily recognize latent indicators, such as mental health problems or substance abuse (Bartkowiak-Théron & Asquith, 2017; Enang et al., 2021; Robbins et al., 2014). Collaboration between the police and these agencies could reduce the number of overlooked victims and thus the risk of under-protection, although this should not place an additional burden on victims in within the justice process.

Expectations and biases towards victims and victim behaviour

Empirical studies on police–victim interactions show that officers' expectations regarding victim behaviour or cultural biases can negatively impact decision making in contexts such as vulnerability assessments (Ask, 2010; Franklin et al., 2020), again increasing the risks of both under- and over-protection. A prime example is rape myth acceptance (RMA) which refers to implicit standards for 'credible victim behaviour' in rape cases (Sleath & Bull, 2017; St George et al., 2021). Officers who accept these myths may consider victims who conform to expectations as more credible, and provide protection more readily, while those who show unexpected behaviour may struggle to receive necessary protection (Sleath & Bull, 2017; St George et al., 2021; Venema, 2019). Marginalized victims, who display nonconforming indicators, such as alcohol abuse, may especially run the risk of under-protection, as officers may interpret

these indicators as signs of unreliability rather than vulnerability (Duggan, 2018; Murphy-Oikonen et al., 2020; Sleath & Bull, 2017). The impact of biases and expectations has not yet been addressed directly in the context of Individual Assessments or risk assessment instruments. However, it is crucial to acknowledge their potential presence as they prevent officers from correctly assessing victims in need of protection.

Expectations and biases may also increase the risk of over-protection. Biases can lead to assumptions about vulnerability based solely on group membership or a single indicator. Stereotypical associations between vulnerability and factors such as socioeconomic status and ethnicity, can lead to stigmatization, particularly of victims stemming from disadvantaged groups (Bartkowiak-Théron & Asquith, 2015; Peroni & Timmer, 2013). Furthermore, biases may result in overlooking factors that promote autonomy and resilience and empower victims (Gilson, 2016). Biases may result in automatically labelling victims as vulnerable solely based on the presence of indicators, even if they have minimal or no protection needs. Without an option to challenge these assumptions or overrule the outcome of the assessment, biases, and expectations may inadvertently lead to over-protection.

Potential solutions

Addressing the impact of police officers' biases and misperceptions on victims could be effectively achieved through training programmes. In England and Wales, for example, several police forces have participated in a programme designed to improve officers' responses to victims of sexual assault. An evaluation of this programme indicated that the training helped dispel rape myths and assisted officers in acknowledging the impact of their beliefs and behaviour on victims (HMICFRS, 2024). Other studies on programmes aimed at correcting officers' misperceptions of victims similarly demonstrate that training could contribute to improving police-victim interactions (Franklin et al., 2020). Taken together, these examples suggest that training programmes could play an important role in reducing officers' biases and misperceptions.

Yet, training programmes alone may not be enough to address challenges arising from daily police practice. A more comprehensive solution may, therefore, be needed, centring on a nuanced understanding of vulnerability that pays attention to both marginalized victims and resilient individuals within disadvantaged groups. This understanding raises awareness of the

interaction of different indicators rather than assessing these in isolation (Bartkowiak–Théron & Asquith, 2015; Gilson, 2016; Walklate, 2011). Such nuances may help to gain a more

comprehensive understanding of vulnerability and reduce the risk of both under- and over-protection.

Overriding of assessment outcomes

Police officers may override the outcome of the assessment, for example, because they believe the victim is vulnerable despite the instrument indicating otherwise. Such overrides are documented particularly in studies of risk assessment instruments (Orton et al., 2020; van der Put et al., 2019) but may also appear in the context of the Individual Assessment. While overruling the outcome may offset the limitations of the narrow focus on risk assessment checklists, overrides may at the same time increase the risk of over-protection by incorrectly labelling non vulnerable victims as vulnerable (Kebbell, 2022; Orton et al., 2020). Misclassification may again patronize and stigmatize resilient individuals, who may negatively associate being labelled as vulnerable with being weak and dependent (Peroni & Timmer, 2013; Verza, 2022). Furthermore, resilient individuals may be offered unnecessary protection, which may disrupt natural coping mechanisms, increasing the risk of over-protection.

Potential solutions

Given the consequences of incorrectly overruling assessment outcomes, it is crucial to aim for a balanced use of overrides. Therefore, it is essential to gain a better understanding of why police officers in some cases override the assessment outcomes. Based on this, assessment guidelines provided to police officers can be adjusted and accuracy may ultimately be improved. Empirical studies show that police officers are generally able to identify high-risk victims, but perform less well when the risk is low (Kebbell, 2022). Exploring ways to improve identification of these victims may contribute to a better-balanced use of overrides and reduce the risk of over protecting victims.

Mismatch between victims' needs and protection measures provided

The risk of under- and over-protection is not only present in the first step of identification but also in the second step in which officers determine the need of taking protection measures. Here, under- and

over-protection ultimately occur when victims receive disproportionate protection. Police officers discuss protection measures with victims and logically they may decline suggested measures. However, police officers may overrule these preferences if they perceive a high level of danger, which may or may not be justified.

Regarding the risk of under-protection, empirical studies of victim-police interactions indicate that victims may feel inadequately protected following vulnerability assessments, indicating a gap between victims' own protection needs and the actual measures provided by officers (Ivankovic et al., 2019; ten Boom, 2022; Villacampa & Salat, 2019). Descriptive data in empirical studies on the Individual Assessment and risk assessment instruments show that approximately half the victims who run a high-risk of repeat victimization receive no protection measures (Geurts et al., 2023; Hehemann et al., 2017). Whether this results from an agreement between the police officer and the victim or insufficient assessment of their protection needs is unclear (Ivankovic et al., 2019). In addition, research of police-victim interactions shows that when protection measures are taken victims may still feel insufficiently protected and may request more intensive measures to better guarantee their safety (ten Boom, 2022; Villacampa & Salat, 2019). This may possibly be explained by officers following a 'one size fits all' approach where all victims receive a similar response regardless of their specific protection needs (Meyer & Reeves, 2021; Raaijmakers et al., 2024). In other words, a tailored response which accurately matches protection needs with appropriate measures may be lacking and result in under-protection of victims with significant protection needs.

In contrast, empirical studies on police officers' decision-making also found that police officers often adopt a '*better safe than sorry*' approach and recommend protection measures driven by risk aversion rather than careful judgement (Meyer & Reeves, 2021; Raaijmakers et al., 2024; Richards et al., 2021). As a result, measures may be counterproductive for victims who are at low risk and not particularly vulnerable, potentially disrupting natural coping mechanisms (Belfrage et al., 2012; Storey et al., 2014). Offering excessive protection measures not only affects victims but also has consequences for police departments. Protecting victims with intensive measures may require considerable effort by the police and thus may burden limited police resources and be in conflict with proportionality principles. All of this adds to the commonly high workload of police officers.

Potential solutions

To reduce the risk of improper assessments of protection needs it is important to determine which measures are effective in which contexts, and to identify who these should target. While previous studies have explored the effectiveness of protection measures based on the outcomes of Individual Assessment and risk assessment instruments (e.g. Belfrage et al., 2012; Geurts et al., 2023; Storey et al., 2014), further research is required to understand the impact of risk management strategies and protection measures under Article 18 and 23 of the Victims' Directive (Pavlou et al., 2019). Empirical studies of police–victim interactions suggest that officers generally respond appropriately to vulnerable/high-risk cases but could reduce unnecessary interventions for non-vulnerable/low-risk cases (Belfrage & Strand, 2012; Geurts et al., 2023; Kebbell, 2022; Storey et al., 2014). A gradual scale of measures would help officers to better distinguish between intensive measures for vulnerable/high-risk individuals with significant protection needs, and less extensive interventions for vulnerable/low-risk individuals. This solution aligns with the Risk–Needs–Responsivity–principle, which states that the intensity of interventions should match with the individual's risk level and should target the individual's needs (Andrews & Bonta, 1990), thereby assuring a more balanced response towards victims and, ultimately, a lower risk of under- or over-protection.

CONCLUSION

Evaluations of vulnerability assessments in police practice, such as risk assessment instruments and the EU Victims' Directive's Individual Assessment, have revealed several shortcomings in the identification and protection vulnerable victims. Although previous studies highlighted shortcomings in identification and protection separately, these have rarely been analysed in conjunction and, more importantly, do not discuss a shared issue: the risk of under- and over-protection. This paper fills this gap. First, it identifies five key shortcomings in vulnerability assessment. Second, it demonstrates their contribution to the risk of under- and over-protecting victims, based on both theoretical insights regarding victim vulnerability and empirical studies of how the police conduct assessments in practice, and police–victim interactions. By demonstrating this overarching issue, this paper critically reviewed how it affects both victims who are in need and those who are not, as well as police departments and officers.

This paper has argued that risks of under- and over-protection emerge during both the identification and protection steps of vulnerability assessments. In the first step, under-protection may result from narrow and fragmented approaches to vulnerability (Bartkowiak-Théron & Asquith, 2017; Enang et al., 2019; Robinson et al., 2016, 2018; Turner et al., 2019; Van der Aa, 2016), leading to overlooking groups of vulnerable victims who may need protection. In addition, biases and expectations towards victim behaviour may have the same effect (Sleath and Bull, 2017; Venema, 2019). During the identification step, over-protection may be the consequence of failure to recognize factors that promote resilience and an incorrect assumption that all victims who fit the criteria are vulnerable (Bartkowiak-Théron & Asquith, 2015; Peroni & Timmer, 2013; Verza, 2022). Moreover, officers may over-protect victims by incorrectly overruling assessment outcomes (Orton et al., 2020; Verza, 2022).

When assessing protection needs in the second step, under-protection may occur when the police offer no or inadequate measures to victims in need of protection (Ivankovic et al., 2019; ten Boom, 2022; Villacampa & Salat, 2019). Over-protection may occur when extensive measures are taken for victims with minimal or no protection needs, with the potential effect of disrupting their natural coping mechanisms (Belfrage et al., 2012; Meyer & Reeves, 2021; Raaijmakers et al., 2024; Richards et al., 2021; Storey et al., 2014). The question of how the police assess protection needs and decide upon which measures should be taken, deserves further research, to allow reduction of both the risks of over and under-protection, given the potential impact on both vulnerable and non-vulnerable victims.

Demonstrating how key shortcomings of vulnerability assessments share the risk of under- and over-protection underscores that police departments face significant challenges when it comes to identifying and safeguarding vulnerable victims. This paper calls upon both researchers and policymakers to be aware of and address the risks of under- and over-protection that follow from the inherent design of vulnerability assessments and how the police conduct these in practice. Future research and policies should aim at helping to reduce failures in identification of victims in need of protection, as well as those who are resilient. This requires the development of a balanced and gradual approach to vulnerability that provides adequate protection for those who need it while empowering victims who are capable of recovery without such interventions.

To stimulate improvements, this paper proposes several pathways to further develop the design of vulnerability assessments and promote police officers' understanding of the impact of how they conduct these on the victim. To reduce under-protection, open fields in assessments could enable specialized non-first responder officers to address indicators beyond the predefined criteria (Svalin et al., 2018), while automated risk assessment instruments could support them in identifying latent indicators, such as prior police contacts (Geurts et al., 2021; Raaijmakers et al., 2022; Turner et al., 2022). Ensuring that instruments better apply to, for example, frontline policing contexts may further help first responders in gathering information relevant for risk assessments (Wire & Myhill, 2018). In addition, existing or newly developed training programmes could play a role in raising officers' awareness of the risks of under- and over-protection. Such programmes could give specific attention to identifying latent indicators, low risk or resilient victims, and on recognizing how officers' biases affect victims. Studies on training initiatives in sexual and domestic violence cases demonstrate the potential of these programmes to improve police-victim interactions (Franklin et al., 2020; HMICFRS, 2024). Implementing, adjusting or continuing these programmes may help mitigate the risks associated with under- and over-protection.

While these improvements are important, they may not fully address the challenges arising from assessing vulnerability in daily police practice. It is, therefore, crucial to also raise more fundamental questions, notably whether the role of police officers in identifying and protecting vulnerable victims should be reconsidered. This refers to the dual role of police officers who interview victims. On one hand, it is expected that they gather detailed information for the purpose of criminal investigation or proceedings, whereas on the other hand police officers must assess and address victims' vulnerability and protection needs (Rumney & Mcphee, 2023; Saxton et al., 2020). Some scholars indeed question whether it is reasonable to expect police officers to identify vulnerability across its diverse manifestations (Groenhuijsen, 2014). While studies suggest that police officers are capable of identifying certain aspects of vulnerability, outcomes in terms of under- and over-protection also underline limitations to what can be expected of police officers, given the constraints of knowledge, time, and resources (Barlow & Walklate, 2021; Belfrage et al., 2012; Myhill et al., 2023; Raaijmakers et al., 2024; Robinson et al., 2016, 2018; Skidmore et al., 2020; Storey et al., 2014). A possible reconsideration of police officers' roles in the assessment of

vulnerability, may partly relieve these constraints and enable officers to focus on their strengths.

Promising avenues may be to experiment with offering generally trained police officers the option of referring cases to specialized police officers or ask advice. Another option could be to foster collaborations with other agencies, such as victim support services and health professionals, for instance in multi-agency safeguarding hubs. Research shows that specialized officers may be better equipped than general officers to assess protection needs and choose protection measures which are better tailored to the needs of individual victims (Meyer & Reeves, 2021; Richards et al., 2021). In addition, other agencies may be better at identifying indicators that are often overlooked in police assessments, such as individual-specific indicators (Bartkowiak-Théron & Asquith, 2017; Enang et al., 2019, 2021). Collaboration with non-police actors could therefore broaden the range of assessments, although this needs to be carefully organized to prevent extra burdening victims, for instance by avoiding they must tell their story twice.

In conclusion, this paper underscores an important overarching issue of the shortcomings in vulnerability assessments that may negatively affect both victims who need protection and those who do not, as well as police departments and officers. By addressing this issue, this paper aimed to pave a way for future research and policy initiatives focused on reducing the risks of under- and over-protection. These efforts hold the potential to enhance the safeguarding of vulnerable victims and to improve the quality of police-victim interactions in general.

Chapter 6

General discussion

When a victim reports a crime to the police, police officers need to determine whether a victim requires protection and, subsequently, which measures should be taken to better ensure the victim's safety. The term *vulnerability* has become an important criterion to guide officers in determining which individuals are most in need of protection (Brown, 2014). Correspondingly, several instruments have been introduced in police practice to support officers in identifying vulnerable victims (Ivankovic et al., 2019; Pavlou et al., 2019). Examples are the Individual Assessment, as stated in Article 22 of the EU Victims' Directive, and various other risk assessment instruments, such as B-SAFER, SASH or DASH (CAADA, 2012; Hehemann et al., 2017; Kropp & Hart, 2004).

Over the past decade, several academic studies criticized the effectiveness of these instruments by identifying a range of shortcomings that may undermine their aim of protecting victims in need (e.g., Kebbell, 2019; Robinson et al., 2018; Turner et al., 2019). Two important concerns refer to the conceptualization of vulnerability and how officers apply the concept in practice. Vulnerability after victimization can be understood in different ways, most notably as the risk of repeat victimization and the impact or harm caused by the victimization-incident (Keay & Kirby, 2017; Walklate, 2011). Furthermore, a wide number of indicators can be used to identify vulnerability. Here, three main categories can be distinguished: victims' individual characteristics, characteristics of the incident and the context in which the incident took place (Innes & Innes, 2013). This diversity in meanings and indicators implies that many types of victims may be classified as vulnerable. Due to this heterogeneity, it's challenging to identify vulnerability. Consequently, some police officers may not take into account the full spectrum of indicators of vulnerability, and differences between police officers in this respect may occur (Keay & Kirby, 2017; Skidmore et al., 2020). This may affect the outcomes of these assessments and, consequently, determine which victims in need receive protection and which victims do not.

Taking these observations into account, this dissertation addressed the identification of victim vulnerability in the policing context and answered the following central research question: *How and to what extent are vulnerable victims identified in daily police practice?* It pursued two aims. First, it aimed to advance our understanding of how police officers assess vulnerability during initial victim reports. This implied giving particular attention to the information they rely on, their professional judgement and their use of assessment tools. Second, this dissertation

aimed to evaluate tools that help officers with assessing a crucial aspect of vulnerability more effectively: the risk of repeat victimization. This involved the development and validation of a risk assessment instrument suitable for integration into automated systems named *ProVict*. This dissertation adopted a multi-perspective approach to provide comprehensive insights into the process of identification of vulnerable victims in the policing context. It examined empirically how police officers' make professional judgements in practice, as well as how police registration data can be used in risk assessment instruments, and from a theoretical perspective, critically reviewed vulnerability assessments conducted by the police. Taking a broad perspective, this dissertation intends to promote a broader understanding of how vulnerability can be identified in the context of policing. This general discussion synthesizes the main findings of the dissertation and reflects on their implications for police practice.

Main findings per chapter

Chapter 2 examined how police officers identify and respond to vulnerable victims. It analyzed Dutch police officers' responses to two fictional scenarios involving a victim who reports a crime, based on the Articulated Thoughts in Simulated Situations approach (ATSS; Davison et al., 1983; Zanov & Davison, 2010). Findings showed that officers primarily focused on incident-related factors, such as crime type and immediate consequences, which confirmed findings in previous studies. Furthermore, participants often took a 'better safe than sorry' approach and recommended protection measures, such as external referrals, regardless of their vulnerability assessment. While this may contradict worries that vulnerable victims may be overlooked (Bartkowiak-Théron & Asquith, 2012; Van der Aa, 2016), it may at the same time address another issue: the risk of over-protection. Providing measures to victims with limited protection needs may disrupt natural coping mechanisms, as well as strain scarce resources with the police and other partners that may need to be involved (Belfrage et al., 2012; Storey et al., 2014; Verza, 2022).

Chapters 3 and 4 focused on the development and validation of *ProVict*, an instrument aimed at assessing the risk of repeat victimization, based on police registration data. Chapter 3 demonstrated that structured police registration data on victims' prior police contacts as a suspect, victim or witness, can be used to better assess the risk of repeat victimization. Findings showed that models correctly classified most repeat and non-

repeat victims but also produced false negatives and a considerable number of false positives. Chapter 4 demonstrated that unstructured police registration data, such as police officers' notes and interview reports, could be used both independently and in combination with structured data to develop a valid risk assessment instrument for repeat victimization. Both showed acceptable to excellent predictive validity and identified the majority of the repeat and non-repeat victims correctly. However, both models also produced false negatives and false positives. Despite these improvements, these assessments of vulnerability will thus still be subject to limitations, implying that the risk of under- and over-protecting victims may remain. Instruments, such as *ProVict*, should therefore be seen as a tool to support professional judgement, but not as a replacement.

Finally, following the recurring observation of misclassifications in the previous chapters, Chapter 5 paid specific attention to the risk of under- and over-protection in the context of vulnerability assessment. More precisely, it demonstrated how five key shortcomings of vulnerability assessment instruments may contribute to the overarching problem of under- and over-protection. Key shortcomings in the identification-step of assessments are fragmented definitions, narrow interpretations and officers' biases towards victims which may lead to overlooking vulnerable victims, while ignoring factors that indicate resilience can result unnecessarily identifying non-vulnerable victims as vulnerable and, ultimately, stigmatization and disempowerment. Furthermore, in the protection-step of assessments, under- and over-protection can occur when proposed protection measures do not align victims' actual protection needs. Protection measures may be either insufficient, leaving victims at risk of further harm, or excessive, potentially disrupting natural coping mechanisms. The risk of over- and under-protection can thus occur in both the identification step of assessments and in the protection step. Mismatches between victims' actual needs and the police response emphasize the need for a more balanced and nuanced understanding of vulnerability. Further closure of this gap could improve police officers' assessments of vulnerability and eventually better ensure that the police response is appropriate and effective.

DISCUSSION AND IMPLICATIONS

This dissertation showed how police officers identified vulnerability and to what extent vulnerable victims were correctly identified in police practice. It demonstrated that officers tend to assess vulnerability from an incident-focused and judicial perspective, thereby giving less priority to non-incident related indicators, such as prior police contacts, mental health problems and risky lifestyles. Due to this limited focus, victims who display other indicators of vulnerability and may need protection may be overlooked. In addition, this dissertation showed that across different assessment methods the police are unable to identify all vulnerable victims correctly. Every assessment method, either based on professional judgement or instruments such as *ProVict* misclassified a certain percentage of victims. This affected both vulnerable victims and non-vulnerable victims. The risk of overlooking victims in need is a recurring concern in academic literature (Enang et al., 2019; Robinson et al., 2016; Van der Aa, 2016). However, this dissertation noted that all assessment methods may also result in incorrectly labelling non-vulnerable victims as vulnerable. Hence, police departments not only face a considerable challenge in adequately protecting victims in need but may also fail to empower victims who require no or minimal protection. Additionally, the police and other partners involved in protection, must ensure the effective allocation of their limited resources in terms of time and capacity, which further underscores the importance of accurate identification of vulnerability.

Triangulating different assessment methods and other improvements in the process of identifying vulnerability in order to avoid misclassification, can be considered a way forward. However, assessments will never be perfect, not in the least because of the complexities and limitations of everyday police practice in which constraints of time and resources apply. Furthermore, officers both need to gather information from a judicial perspective and assess the needs of victims who report a crime, which may require a balancing act. The current section therefore outlines several points that may contribute to further improvement of vulnerability assessments but also discusses challenges for police departments and victims.

The role of police officers and other organizations in identifying vulnerable victims

In modern-day police work, officers need to balance their judicial and victim support roles during initial victim reports (Johansen et al., 2022; Rumney & Mcphee, 2023). Performing these two tasks simultaneously is complex and this may significantly limit police officers' ability to accurately identify vulnerable and non-vulnerable victims. These constraints imply that the room to improve identification of vulnerable victims may be limited to, for example, including additional indicators that can be assessed quickly.

This raises the question whether the police context is suitable for identifying the full spectrum of vulnerability and whether it is reasonable to expect police officers to assess this highly heterogenous concept. Groenhuijsen (2014, 2018) raised similar questions, arguing that thorough vulnerability assessments may not be feasible in daily police practice. Assessing the full range of vulnerability indicators would indeed be time-consuming and demand specialized expertise whereas it cannot realistically be expected from all regular police officers to acquire such knowledge. This particularly refers to assessing complex indicators such as mental health problems. Due to these constraints, assessments may also be conducted incompletely. As several studies showed, risk assessment forms are often only partly filled in (Robinson et al., 2018; Svalin et al., 2018; Turner et al., 2019). In this regard, police officers often focus on specific indicators, instead of taking the full spectrum of indicators into account.

While such findings may lead to the conclusion that the policing context may not provide an optimal setting for adequately capturing all aspects of vulnerability, this dissertation demonstrated that police officers are able to correctly assess indicators tied directly to incidents and immediate safety concerns. Chapter 2, for instance, showed that type of crime and the short-term consequences of the incident were used as indicators to assess needs for further protection, while Chapters 3 and 4 demonstrated that information already included in police registration databases could to a certain extent support correct assessment of the risk of repeat victimization. Within the short timeframe police officers have to conduct assessments, incident-related information is of primary value. Other indicators, such as risky lifestyles or mental health problems, are more distant to the incident and therefore more likely to be overlooked. This prompts the question whether all police officers who are first-responders

or responsible for interviewing victims should be expected to address the full scope of vulnerability.

Since first-responders or front-office officers at the police station may lack the time, resources and expertise to address non-incident related aspects of vulnerability, expecting that they are able to cover the full spectrum of indicators of vulnerability may not be realistic. Therefore, a more integrated, multi-agency approach is needed to identify and respond to victim vulnerability. Supporting and protecting a diverse group of victims requires a broad range of expertise and resources that can be found not only within the police, but also among specialized organisations, such as victim support services and health professionals (Bradford et al., 2025; Würtz Jensen & Thunberg, 2024). The police and these specialized organizations may approach the identification of vulnerability differently and may complement one another in assessing vulnerability. For example, the police approach victims' needs for protection from a situational perspective, based on incidents reported, while other agencies focus more strongly on the individual (Enang et al., 2019). Since officers tend to particularly overlook individual characteristics in vulnerability assessments, the other partners could fill this gap. Collaborations between these agencies would allow to assess vulnerability more broadly and increase accurate identification.

This would require involving representatives from victim support services or other professional specialists, such Independent Domestic Violence advocates or advisors (IDVA), in front-line police situations (Davies & Barlow, 2024). When a victim reports a crime, professionals from other organizations are often not physically nearby, making a timely response challenging. Accommodating these professionals at police station or at least near the location where victims usually report crimes could bridge this distance but is practically unrealistic.

An alternative approach could therefore be a front-office/back-office model in which specialists, such as victim support organizations or health care professionals, but also specially trained police officers, can be called in – also remotely because physical presence at each police station is unfeasible – when during interviews front-line professionals notice 'red flags' that need to be evaluated more carefully.

The following example of a victim who reports a non-violent street robbery illustrates this arrangement. The victim tells the officer about

the incident, provides information on the location, what was stolen and that the offender was unknown to them. No violence was used, and the victim was not physically harmed, but they tell the officer that they are scared to go outside alone. The victim does not seem to require immediate protection but could benefit from additional emotional support. While officers may be capable of providing this support, the limited timeframe available for interviewing the victim, and their focus on the judicially relevant aspects of the incident, may limit proper assessment of what the victim needs and subsequently providing adequate support. Without specialists in the back-office, the victim may receive no support or only at a later moment, since other specialists are not notified until after the crime report is processed. In order to be more effective, back-office specialists need to be available on-call to assess what the victim may need in terms of further support, ideally when the interview is still ongoing and before the crime report is fully processed.

To some extent, these collaborations are already embedded in current police practice. For example, police officers can often refer victims to victim support organisations, specialised professionals, such IDVA's, or multi-agency hubs that coordinate joint responses to victims (Robbins et al., 2014; Shorrocks et al., 2019). Cooperating with other partners that support victims is an important step towards a more comprehensive and nuanced approach to the support and protection of vulnerable victims. However, partner organizations may also be constrained by limited capacity and referral procedures can be time-consuming due to the complexity of crime reports (Robbins et al., 2014; Shorrocks et al., 2019). Given the importance of early interventions for victims in need of protection, reducing the time between their contact with the police in which they first report the crime and receiving adequate support, should therefore be a priority.

While involving specialized professionals, either from the police or other organizations, in front-line police settings may contribute to a more comprehensive response towards victims and more immediate application of protection measures, several issues need to be addressed for an effective and realistic implementation of this idea. As an initial step, clear agreements must be reached to establish the task and role of each organization and representative. In these agreements, special attention should be given to which aspects of vulnerability an organization identifies and how they support or protect victims displaying these aspects. For example, the police should focus on

identifying incident-related indicators and assessing protection needs. Victim support organizations could focus on assessing the impact of the incident and providing emotional support, while public health professionals could identify mental health problems or substance abuse issues and offer appropriate support. Establishing each of these aspects is important, because it creates operational clarity and outlines the extent to which the broad concept of vulnerability is covered. In practice, however, efforts to assess vulnerability more comprehensively must also take into account the boundaries of what information is both feasible and desirable to collect. Not all information can be collected within the available timeframes and ethical concerns on gathering specific types of information as (semi-)government institutions must be taken into consideration, for example on indicators such as ethnicity, religion and political preferences.

In addition, fostering collaborations between agencies is costly in terms of time, resources and capacity (Davies & Barlow, 2024; Robbins et al., 2014; Shorrocks et al., 2019). These constraints may also apply to the solution outlined above, making it an aspirational but potentially difficult-to-achieve scenario even if back-office experts participate remotely instead of being physically present during the interview. Small scale solutions, for example starting in several individual police stations, may therefore be more feasible in the short run. These solutions should at least address three key components. First, different actors with different perspectives on vulnerability should work together to ensure a wider approach to vulnerability. This may reduce the risk of overlooking victims. Second, these actors should aim to reduce the time between reporting the crime and receiving support and protection by the police or other organizations. This may reduce the period of feeling unsafe. Third, and most importantly a solution should not unnecessarily burden victims and increase the risk of secondary victimization. This implies that victims should not be required to frequently repeat their story or to do so in settings that can be experienced as highly stressful. Holding these three components into account, initiatives could be explored that enhance the identification of vulnerable victims and aide the police in safeguarding them.

Victims' perspective in the identification of vulnerability

This dissertation indicated that combining multiple sources of information could be important to optimize the identification of vulnerability. Chapter 4, for example, demonstrated that different types of data could complement each other, thus enhancing the predictive

validity of *ProVict*. Furthermore, *ProVict* relied on indicators which police officers generally did not consult when making their professional judgements: prior police contacts (see Chapter 2). Therefore, *ProVict* could complement officers' professional judgements, and thereby better ensure that victim vulnerability is correctly identified and followed up with appropriate protection measures.

This dissertation focussed on assessment methods that involved the police perspective, because of the importance of understanding how police officers identify vulnerability and perform their gatekeeping role. Yet, other perspectives could also contribute to a better identification of vulnerability. This may specifically apply to the perspective of the victim who reports a crime. Victims' narratives may provide useful information on protection needs, and which protection measures may best fulfil these needs. To gather this information, it is crucial that officers understand how individuals construct their experiences after an incident. Both an individual's own identification as a victim and others' acceptance of this status can play an important part in seeking support and protection and, eventually, receiving and accepting it (Thunberg & Andersson Bruck, 2020). Therefore, during assessments of vulnerability and protection needs, more attention could be given to police officers' understanding of victim narratives. To achieve this, victims' narratives could be taken as a starting point in conversations between officers and victims. These conversations should eventually focus on which protection measures are appropriate and which agency, if not the police, could best provide these measures (Würtz Jensen & Thunberg, 2024). Furthermore, this approach could help officers to acquire a deeper understanding of individual victimization experiences, while ensuring that ownership of the narrative remains with the victim (Pemberton et al., 2019).

The goal of this approach is to ensure that, during interviews with victims, police officers focus more on trying to understand how the individual views themselves and the incident. Consider, for instance, a scenario in which a victim reports a violent abuse. The victim is injured and shocked by what happened but simultaneously feels resilient and determined to not let the incident get the better of them. Traditionally, police officers would listen to the victim's story, and ask questions that provide important information on the case and the victim's current safety. This approach risks ignoring how individuals construct their status as victims and their lived experiences following the incident, as these aspects may not be considered directly relevant from a judicial perspective. Yet, it is

important to take into account victims' own views on their needs and which responses they consider appropriate. For instance, asking how victims feel after the incident and how it has affected them socially or emotionally can provide useful information and help to shape adequate police responses and supports victims' processing of the incident. The individual's narrative should be combined with information gathered through other assessment methods, in order to reach a more fully informed decision, based on multiple perspectives.

While including victims' perspectives more extensively may provide relevant information, this approach also presents several challenges. First, it requires police officers to also address information less directly connected with the incident, whereas they normally take on a more judicial or criminal justice system-centric perspective, as was noted above. Second, officers may struggle with identifying victims' own perspectives on protection needs because they may not always clearly express these needs (Meyer & Reeves, 2021; ten Boom, 2022). Yet, being able to 'read between the lines' is required to follow this approach effectively. Third, individuals who report a crime may not be able or willing to formulate their needs or share how they perceive themselves after an incident (Würtz Jensen & Thunberg, 2024). Here too, police officers need to recognize which victims are able to articulate their victimhood and which victims may struggle. In other words, this approach puts strong demands on how both parties interact. Consequently, it can only be implemented when officers have received thorough training on communication skills aimed at discovering and understanding how individuals construct their own victimhood. Despite these challenges, it is crucial to conduct future research on how the victims' perspective could be better included in the process of identifying vulnerable victims.

Advancing our understanding of misclassifications

Both assessment methods addressed in this dissertation may result in outcomes that leave some victims under-protected, whereas others may be over-protected. Academic literature predominately expressed worries regarding the former (Enang et al., 2019; Gilson, 2016; Robinson et al., 2016, 2018; Van der Aa, 2016). However, this dissertation argues that the latter also requires particular attention in vulnerability assessment instruments. During the development and validation of assessment instruments, researchers, policymakers and other relevant professionals should, therefore, explore ways to improve the accurate identification of

both vulnerable and non-vulnerable victims.⁵ It is essential to monitor how officers apply assessment instruments in practice and how this affects victims, both positively and negatively. This may contribute to identifying potential shortcomings in assessment instruments and developing adequate solutions.

However, such improvements first require a deeper understanding of when victims are under- or over-protected, both when identifying vulnerability and when proposing protection measures. However, few objective baselines to empirically determine such misclassifications exist. Consequently, this dissertation addressed and approached under- and over-protection in extreme terms. This referred to scenarios in which no protection measures were offered to victims with clear protection needs, and conversely, situations in which extensive protection measures were offered to victims with minimal needs. Chapters 3 and 4, for example, defined repeat victims who were labelled as non-repeat victims as being under-protected, or vice versa. This dissertation, thus, addressed these misclassifications as a dichotomous concept: a victim is either correctly or incorrectly labelled. In practice, however, misclassifications may be more heterogenous and, therefore, also more complex to recognize.

Hence, to fully tackle the problem, we need a better and more nuanced view on what under- and over-protection means. Such efforts should start with establishing the different manifestations of misclassifications. Victims' experiences with the outcomes of assessment instruments and police responses may inform us of the consequences of inadequate protection, unnecessary measures, or other situations in which the police response mismatched with victims' needs. Gathering information on these experiences may produce a wide variety of scenarios which help to better understand the heterogenous nature of misclassifications. This dissertation, therefore, calls for future research that focuses on how victims experience the outcome of assessments and the appropriateness of subsequent protection measures. These experiences may also inform us on which measures should be taken to mitigate the risk of misclassifications and where additional support is needed to reduce the negative effects of misclassifications.

5 In the context of automated risk assessment instruments, this requires testing on algorithmic fairness metrics in order to determine whether these instruments negatively affect individuals (e.g., Turner et al., 2022).

LIMITATIONS

This dissertation offered a comprehensive view of the identification of victim vulnerability in police practice, by incorporating multiple perspectives. It used both qualitative and quantitative data and highlighted the police practice of officers, police systems and academic literature on vulnerability and assessment instruments. In doing so, it strived to offer insights based on a broad view of this topic in the policing context.

However, this dissertation also faced several limitations. First, it only addressed how the police would identify vulnerability. Given the police's gatekeeping role, attention to this perspective is essential. However, this dissertation did not study the role of victims' perspectives in vulnerability assessments, although victims' self-perceived vulnerability and articulated needs may offer valuable insights for such assessments and, equally important, for potential misclassifications. Assessment outcomes and victims' self-perceptions may in some cases correspond, but victims' self-perceived vulnerabilities and actual needs may also differ from police officers' judgements (Aihio et al., 2017; Meyer & Reeves, 2021; ten Boom, 2022). These differences may for instance occur in particular in cases in which victims deviate from police officers' general understanding and expectations of victim behaviour and vulnerability (Bosma et al., 2018; Duggan, 2018; Murphy-Oikonen et al., 2020; Sleath & Bull, 2017). Again, different perceptions may promote under- as well as over-protection. Differing views or contradicting information may pose a particular and frequent challenge for the officers' decision-making. However, in this dissertation, such aspects could not be addressed. Therefore, future research and discussion on the role of victims' self-perceived vulnerability in police officers' decision-making could contribute to improved identification of victims in need and may offer pathways for reducing the risk of misclassification.

Second, this dissertation aimed to closely reflect daily police work through realistic scenarios (Chapter 2), the use of police registration data in assessment instruments (Chapters 3 – 4) and literature on police-victim interactions (Chapter 5). However, some practical aspects that police officers may encounter remained unexamined. This refers to operational constraints such as workloads but also to interpreting information such as victims' body language (Dinkins & Jones, 2018) or

their emotional responses (Bosma, 2019).⁶ Police officers may encounter such constraints in daily practice – some more regularly than others – and these may influence their assessments of vulnerability and decision making. Future studies could thus advance our understanding of how police officers achieve professional judgements and provide relevant insights in the practical use of assessment instruments such as *ProVict*. Indeed, contextual, situational and operational aspects affect how such instruments are used. Hence, further evaluation of how instruments such as *ProVict* function in practical contexts, is crucial. Such research may help to identify implementation barriers and unintended consequences and contribute to further improvements.

Finally, this dissertation addressed two main assessment methods that officers could use to assess vulnerability: professional judgements following from individual assessments, and risk assessment instruments. It argued that both could theoretically complement each other, because these partly rely on different information sources and use different sets of indicators. However, this dissertation did not empirically study to what extent professional judgements and *ProVict* complemented each other. In other words, it's unclear to what extent a combined approach correctly identifies both vulnerable and non-vulnerable victims. Correspondingly, it's also unclear how this combined approach affects the risk of misclassifications. This dissertation argued that the risk of misclassifying victims may be inherent to the identification of vulnerability. Novel approaches may improve identification but could still lead to under- and over-protection. Chapter 5 of this dissertation addressed several shortcomings in the practical use of assessment instruments by police officers. Such shortcomings may also affect practical use of novel approach, such as the combined use of *ProVict* and professional judgements. Therefore, follow-up actions should focus on examining both the predictive validity of combined approaches as well as how officers use these in daily police practice. Addressing these two themes would provide further insights into how vulnerability could be assessed using multiple perspectives and how the risk of misclassifications could be mitigated.

⁶ Additionally, this dissertation did not explicitly focus on specific victim groups that may be marginalized, such as drug users and sex workers.

FINAL CONCLUDING REMARKS

Using *vulnerability* as a key criterion for determining victims' needs of support or protection, is not new. However, how to adequately assess vulnerability in practice, continues to be a topic of academic debate and critical analysis. This dissertation explored the assessment of victim vulnerability in a policing context and strived to answer the following main question: *How and to what extent are vulnerable victims identified in daily police practice?* The findings show that vulnerability is often identified by focusing primarily on incident-related information, whereas other indicators receive less attention or priority. In addition, this dissertation concludes that every available assessment method may come with an inherent risk of misclassifying victims which leads to either under- or over-protection of victims. This poses an important challenge to police officers who conduct vulnerability assessments. Throughout this dissertation, I called for improvements in current assessments or triangulation of assessment methods. Yet, despite such improvements misclassifications can never be fully prevented. Consequently, it may be necessary to discuss thresholds regarding which percentage of misclassifications could be deemed acceptable. From an organizational perspective, setting these thresholds may appear logical, but also unsatisfactory from an academic perspective, because this does not solve the underlying problem.

This dissertation makes an argument for acknowledging the risks of misclassifications on the one hand and proactively finding ways to better understand and mitigate them on the other hand. Within the criminal justice system, the police play an important role as gatekeepers and this also includes offering support and protection measures to victims in need. Actions and decisions by police officers during interactions with victims may have serious consequences. Each victim who reports a crime is entitled to an adequate assessment of their vulnerability and responses appropriate for their concerns and needs. While it may not be possible to satisfy all victims, it should be a mission for the police to keep improving. This calls for reflective openness and the willingness to learn and develop, while refraining from assigning blame to anyone. These mechanisms may contribute to improving police-victim interactions and enable officers to deliver the responses that best fit victims' needs.



Summary

SUMMARY

In the police context, the term *vulnerability* has become an important criterion to determine which victims are most in need of receiving protection. The identification of vulnerability, however, is complex given the heterogenous nature of the concept (Brown et al., 2017). It can have different meanings, such as the risk of repeat victimization or the impact of the experience of victimization. Furthermore, it can be recognized using a wide range of indicators, such as characteristics of the victim, the specific victimization-incident or the context in which victimization takes place. To aid police officers with the identification of vulnerability, several assessment instruments have been introduced in police practice. Examples are the Individual Assessment, as stated in the Article 22 of EU Victims' Directive (2012/29/EU), and various risk assessment instruments, such as B-SAFER, SASH or DASH.

The heterogenous nature of vulnerability, however, makes it difficult to address the concept's full spectrum during assessments. Narrow interpretations of vulnerability in both the instruments' designs and the practical use by police officers suggest that only a subset of vulnerable victims may be identified correctly. Partial and flawed identification of vulnerable victims may lead to overfocussing on one group of victims while overlooking others.

This dissertation addresses the identification of vulnerability in the police context. Its central research question is: *How and to what extent are vulnerable victims identified in daily police practice?* This thesis has two aims. Firstly, it strives to advance our understanding of how police officers identify victim vulnerability when a victim reports a crime. Secondly, it aims to evaluate tools that may help to assess the risk of repeat victimization more effectively. Both aims are addressed from multiple perspectives, each highlighting relevant aspects of police practice.

MAIN FINDINGS PER CHAPTER

Chapter 2 examines how police officers identify and respond to vulnerable victims. Using the *Articulated Thoughts in Simulated Situations* approach (ATSS; Davison et al., 1983), it analyzes Dutch police officers' responses to two fictional vignettes portraying a victim reporting a crime. Findings demonstrate that officers primarily relied on incident-related

factors, such as the type of crime and the immediate consequences of victimization. Additionally, the study revealed that officers proposed protection measures, such as external referral or stop-conversations in stalking cases, regardless of the outcomes of their vulnerability assessment, which points at taking a 'better safe than sorry' approach. This seems to contradict worries in earlier research that victims in need may be overlooked, but it raises a different issue: the risk of over-protection. Providing measures to victims with minimal or no protection needs may strain scarce resources and disrupt natural coping mechanisms. This chapter provides relevant insights into how officers assess vulnerability based on their professional judgement (and thus without assessment instruments). It also demonstrates the shortcomings of this assessment method.

Chapter 3 addresses the development and validation of *ProVict*: a risk assessment instrument for assessing the risk of repeat victimization, based on structured police registration data, more specifically victims' prior contacts with the police. Findings demonstrate that prior contacts with the police could be used to develop a valid risk assessment instrument, as the instrument could correctly identify a majority of the repeat and non-repeat victims. However, the instrument also produces some false negatives in which repeat victims were placed in the low-risk category, and a considerable number of false positives in which non-repeat victims were placed in the high-risk category. Both misclassifications can be problematic. Overlooking at-risk victims leaves them vulnerable to new harm, while allocating measures to those with minimal needs risks over-protection. This chapter demonstrates the potential of using structured police data for risk assessment, while also showing significant limitations.

Chapter 4 builds upon Chapter 3 and incorporates unstructured police data in *ProVict*, such as police officers' notes and interview reports. It explores to what extent unstructured police data, both independently and combined with structured data, could be used for assessing the risk of repeat victimization. Findings show that unstructured data independently yielded acceptable to excellent predictive validity. An instrument that combines both structured and unstructured data also shows acceptable to excellent predictive validity and correctly identifies the majority of repeat and non-repeat victims. The findings, however, still carry a risk of misclassifying victims. *ProVict* can be promising, but should not be used as a stand-alone assessment method. To reduce the risks of

misclassifications in the future, it's important to also include additional risk factors and protective factors from outside the police context in the instrument.

Chapters 2 through 4 showed that the risk of under- and over-protection could occur in methods applied to assess vulnerability. To address this further, Chapter 5 critically reviews how five key shortcomings of vulnerability assessment instruments contribute to the risk of under- and over-protection. Fragmented definitions, narrow interpretations by officers, biases and the withholding of adequate protection measures may lead to under-protection and thus to the risk of overlooking victims who have an increased risk of repeat victimization. In contrast, neglecting resilience factors when assessing vulnerability, overriding assessment outcomes and providing measures to victims with minimal or no protection needs, may result in over-protection. Both misclassifications reflect a discrepancy between the risk for a victim to become confronted with new harm and victimization and the police assessment of this risk. This difference may expose victims either to further harm or undermine empowerment and natural coping mechanisms. This chapter calls for greater awareness of under- and over-protection and advocates for a more nuanced understanding of vulnerability.

CONCLUSION AND DISCUSSION

To answer the central research question, this dissertation highlights two key findings. First, it concludes that officers assess vulnerability from an incident-focused perspective, thereby overlooking non-incident related indicators. Second, across different assessment methods, this dissertation demonstrates that not all vulnerable victims and non-vulnerable victims are identified correctly. Different assessment methods all demonstrated the risks of under- and/or overprotection. Both types of misclassifications can have serious consequences for how victims process victimization-incidents. This challenges police organisations to find a better balance between protecting those in need while simultaneously avoiding unnecessary interventions for those with minimal and no needs for additional protection. This requires a broader and more nuanced approach to victim vulnerability. Additionally, this may require more extensive collaboration between the police and other organizations that provide support to victims. Together with new research on the nature and consequences of misclassifications, a more nuanced understanding

of vulnerability can contribute to an enhanced identification of vulnerable and non-vulnerable victims.

Samenvatting

SAMENVATTING

‘Kwetsbaarheid’ is binnen de politiepraktijk een belangrijk criterium geworden om te bepalen welke slachtoffers het meest in aanmerking komen voor aanvullende beschermingsmaatregelen. Door het heterogene karakter van het concept is kwetsbaarheid echter lastig vast te stellen (Brown et al., 2017). Kwetsbaarheid heeft verschillende betekenissen, zoals een verhoogd risico op herhaald slachtofferschap of een grotere impact van slachtofferschap. Daarnaast is een breed scala aan indicatoren gerelateerd aan kwetsbaarheid, zoals kenmerken van het slachtoffer, het incident en de context waarbinnen het incident plaatsvond. Om politiefunctionarissen te ondersteunen met de beoordeling van kwetsbaarheid, zijn verschillende instrumenten geïntroduceerd. Voorbeelden zijn de Individuele Beoordeling (zie Artikel 22 van de EU Richtlijn voor slachtofferrechten; 2012/29/EU), en risicotaxatie instrumenten zoals B-SAFER, SASH en DASH.

Door de heterogeniteit van kwetsbaarheid is het echter moeilijk om dit begrip volledig in deze instrumenten te vatten. Zowel in de inhoud van de instrumenten als in het praktisch gebruik ervan kan sprake zijn van een te beperkte opvatting van kwetsbaarheid. Dit kan leiden tot onvolledige of onjuiste identificatie van kwetsbare slachtoffers, waarbij sommige groepen veel aandacht krijgen, maar andere kwetsbare groepen buiten beeld blijven.

Dit proefschrift onderzoekt de beoordeling van kwetsbaarheid van slachtoffers in de politiepraktijk. De centrale onderzoeksvraag is: *Hoe en in welke mate worden kwetsbare slachtoffers geïdentificeerd in de dagelijkse politiepraktijk?* Dit proefschrift heeft twee doelen. Ten eerste beoogt het meer inzicht te bieden in de wijze waarop politiefunctionarissen kwetsbaarheid van slachtoffers vaststellen. Ten tweede evalueert dit proefschrift instrumenten die hen kunnen ondersteunen bij het beoordelen van het risico op herhaald slachtofferschap. Beide doelen worden vanuit meerdere perspectieven onderzocht.

BEVINDINGEN PER HOOFDSTUK

Hoofdstuk 2 onderzoekt hoe politiefunctionarissen de kwetsbaarheid van slachtoffers beoordelen en hoe zij vervolgens op deze slachtoffers reageren. Met behulp van de *Articulated Thoughts in Simulated Situations*

methode (ATSS; Davison et al., 1983) worden de reacties geanalyseerd van Nederlandse politiefunctionarissen op twee fictieve scenario's waarin een slachtoffer aangifte doet. De resultaten laten zien dat agenten hun oordeel over kwetsbaarheid vooral baseren op indicatoren die gerelateerd zijn aan het incident, zoals het type delict en de gevolgen voor het slachtoffer op korte termijn. Daarnaast bieden politiefunctionarissen beschermingsmaatregelen (verwijzingen naar hulporganisaties of stopgesprekken bij stalking) aan slachtoffers ongeacht hun oordeel over de kwetsbaarheid. Dit wijst erop dat politiefunctionarissen het zekere voor het onzekere nemen. Deze bevinding lijkt zorgen uit eerdere studies over het risico op onderbescherming te weerspreken, maar duidt op een mogelijk ander probleem: het risico op overbescherming. Beschermingsmaatregelen aanbieden aan slachtoffers die geen of beperkte beschermingsbehoeften hebben, kan de schaarse politiecapaciteit verder belasten en natuurlijke herstelprocessen van slachtoffers verstoren. Dit hoofdstuk biedt daarom niet alleen inzicht in hoe politiefunctionarissen kwetsbaarheid beoordelen, maar laat ook de beperkingen zien van deze beoordelingswijze.

Hoofdstuk 3 analyseert de ontwikkeling en validering van *ProVict*: een instrument dat het risico op herhaald slachtofferschap inschat op basis van gestructureerde gegevens, zoals eerdere contacten van slachtoffers met de politie die zijn vastgelegd in politie registratiesystemen. De resultaten laten zien dat deze gegevens kunnen worden gebruikt om tot een valide risicotaxatie te komen. *ProVict* identificeert de meerderheid van de herhaalde en niet-herhaalde slachtoffers correct. Er is echter ook sprake van vals-negatieven, waarbij slachtoffers in de laag risicocategorie worden geplaatst en toch herhaald slachtoffer worden. Daarnaast is er een aanzienlijk aantal vals-positieven, waarbij personen worden geplaatst in de hoog-risico categorie, maar niet nogmaals slachtoffer worden. Deze foutieve uitkomsten kunnen problematisch zijn. Kwetsbare slachtoffers kunnen onopgemerkt blijven terwijl zij een risico lopen op hernieuwd slachtofferschap (vals-negatieven), terwijl andere slachtoffers mogelijk onnodig beschermingsmaatregelen ontvangen en daardoor overbeschermd worden (vals-positieven). Daarmee toont dit hoofdstuk zowel het potentieel als de beperkingen aan van risicotaxatie op basis van gestructureerde gegevens.

Hoofdstuk 4 bouwt voort op Hoofdstuk 3 door ook ongestructureerde politiegegevens, zoals notities en verslagen van politieagenten, in *ProVict* te integreren. Hier is onderzocht in hoeverre dergelijke gegevens,

zowel afzonderlijk als gecombineerd met gestructureerde gegevens omtrent politiecontacten, kunnen worden gebruikt om het risico van herhaald slachtofferschap in te schatten. De resultaten tonen aan dat beide benaderingen een acceptabele tot uitstekende predictieve validiteit opleveren, waarbij de meerderheid van de herhaalde en niet-herhaalde slachtoffers correct worden geïdentificeerd. Ook bij de instrumenten in deze studie blijft echter sprake van vals-negatieven en vals-positieven. De algemene conclusie is daarom dat *ProVict* potentie biedt, maar dat het instrument niet als afzonderlijke basis voor risicotaxatie kan worden gebruikt. Het risico van foutieve inschattingen kan worden verkleind door instrumenten aan te vullen met risico- en beschermende factoren die de politie vaak niet registreert.

Hoofdstukken 2 tot en met 4 laten zien dat het risico op onder- en overbescherming aanwezig kan zijn in verschillende methoden en instrumenten om kwetsbaarheid te beoordelen. Hoofdstuk 5 betoogt hoe vijf tekortkomingen van deze instrumenten bij kunnen dragen aan het risico op onder- of overbescherming. Onderbescherming kan bijvoorbeeld komen door gefragmenteerde en onvolledige definities van kwetsbaarheid, beperkte interpretaties van kwetsbaarheid door politiefunctionarissen die de beoordelingen uitvoeren, vooroordelen omtrent bepaalde groepen slachtoffers en het niet nemen van adequate beschermingsmaatregelen. Overbescherming kan daarentegen komen door het negeren of niet herkennen van veerkrachtfactoren van slachtoffers, het terzijde schuiven van de uitkomsten van risicotaxaties en het onnodig aanbieden van beschermingsmaatregelen. In beide gevallen is sprake van een discrepantie tussen het daadwerkelijke risico dat een slachtoffer loopt op nieuw slachtofferschap en de inschatting van de politie van dit risico, met mogelijke gevolgen voor zowel de veiligheid als het verwerkingsproces van slachtoffers. Dit hoofdstuk pleit daarom voor een groter bewustzijn van onder- en overbescherming en een genuanceerder begrip van kwetsbaarheid.

CONCLUSIE EN DISCUSSIE

Dit proefschrift leidt tot twee centrale bevindingen. Ten eerste toont het onderzoek aan dat politiefunctionarissen de kwetsbaarheid van slachtoffers voornamelijk inschatten op basis van incidentgerelateerde informatie, terwijl andere informatie minder wordt meegewogen. Ten tweede blijkt dat zowel kwetsbare als niet-kwetsbare slachtoffers

slechts gedeeltelijk correct kunnen worden geïdentificeerd. Ongeacht de beoordelingsmethode bestaat een risico op onder- of overbescherming. Foutieve inschattingen kunnen grote gevolgen hebben voor hoe slachtoffers de nasleep van incidenten verwerken. Hiermee staat de politieorganisatie voor de uitdaging om een balans te vinden tussen tijdige en adequate bescherming van slachtoffers met beschermingsbehoeften en het voorkomen van onnodige interventies bij slachtoffers die deze niet nodig hebben. Dat vraagt om een bredere en genuanceerdere benadering van de kwetsbaarheid van slachtoffers, waarbij de politie mogelijk ook de samenwerking met andere organisaties kan verbeteren. In combinatie met verder onderzoek naar de aard en gevolgen van foutieve uitkomsten, kan worden gekomen tot een betere identificatie van kwetsbare en niet-kwetsbare slachtoffers.

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Appendices

Appendix A: Supplementary tables Chapter 2

Table A1. Full English translations vignette–blocks PC–scenario

Indicator	Text
Block 1A: Less risky lifestyle	“Yesterday, I cycled home from work. My nightshift in the retirement home ended around 10 p.m.. I was very tired, so I really wanted to go home. The largest part of my way home crosses a residential area near the retirement home. That’s is the quickest route, because you take a shortcut from the main roads. Near the edge of the residential neighbourhood, there is quiet parc. It happened near the playground in the parc.”
Block 1B: Risky lifestyle	“Last night, somewhere around 5 a.m., I cycled back from the bar. Every Friday, I like to start the weekend by going out to town, just to let off some steam. I drank a lot, surely ten beer and additionally some shots, I think. I wanted to go home quickly. To take a shortcut, I always cycle through an industrial area. You don’t have to worry about the traffic lights, so it’s a lot quicker. It happened near one of the hardware stores in that industrial area.”
Block 2: Type of crime	“Out of the blue, a scooter came driving straight towards me. Luckily, I could stop right in time. The driver got off the scooter and approached me. He told me to give him my wallet and phone. I could not see clearly what he looked like, but he sounded young. He stood right in front of me and said that I could better give him the stuff, otherwise I would have a big problem. I thought that he had a knife, at least I saw something shiny. I felt threatened so I did what he wanted. Who knows what he was capable of? After I gave him my wallet and phone, he ran towards his scooter and drove away. It all happened so fast, I did not see the licence plate.”
Block 3A: Fear	“After he left, I quickly cycled back home. I didn’t sleep all night. This morning, I struggled to keep my food down. I don’t know if I still dare to go outside alone at night. Maybe, I can better drive together with someone from now on. In any case, I will avoid that [parc/industrial area]. I hope that you can catch the perpetrator, so I dare to walk the streets again.”
Block 3B: Resilience	“After he left, I quickly cycled back home. I felt terrible, but I’m not going to let this get to me. Next time around, I will just cycle through that [parc/industrial area] again. Actually, I would like to explain to the offender how he affects other people. Maybe that will teach him to keep his hands of other people’s stuff. I hope that you can catch the offender, so I can make that clear to him and have some closure.”
Block 4A: No prior police contacts	‘There are no registrations known in the police registration system for this victim. The victim, thus, has no prior police contacts.’

Table A1. Continued

Indicator	Text
Block 4B: Prior police contacts as victim/witness	'In the police registration system, the victim has the following police contacts: - Incident: Assault; Role: Witness; Date: 04-12-2019 - Incident: Insult; Role: Victim; Date: 16-09-2019'
Block 4C: Prior police contacts as suspect	'In the police registration system, the victim has the following police contacts: - Incident: Driving under influence (alcohol); Role: Suspect; Date: 14-11-2019 - Incident: Driving under influence (alcohol); Role: Suspect; Date: 07-07-2019'

Table A2. Full English translations vignette blocks ST-scenario

Indicator	Text
Block 1A: Less risky lifestyle	“Yesterday, just after ten, I walked back to my car. I just went to the supermarket. Since I have a busy job, I often have to do the grocery shopping in the evening. At that time, it is fairly quiet in the supermarket. There were only a few cars left in the parking lot. As for the rest, there was no one in sight. I was standing close to my car looking for my car keys when I suddenly heard someone behind me.”
Block 1B: Risky lifestyle	“Last night, around 4 am, I walked back from a techno party. Those parties are held monthly and I rarely skip one. I had approximately seven mix-drinks under my belt, so I drank quite a lot. Anyhow, my bicycle is always parked in the same alley, because there is always a free space. While I was looking for my bike keys, I heard someone behind me.”
Block 2: Type of crime	“I immediately recognized the voice: it was my sister’s friend. He sounded angry and asked why I did not respond to his texts. We had been on a few dates. That was fun, but I quickly closed it off. He, however, wanted more. For a couple of weeks, he has been sending me texts and voicemails. He is often looking for me at [the supermarket/parties]. I have always managed to avoid him, until [yesterday/last night]. I said that he should really stop this and that I would go to the police otherwise. This only made him more angry. He stood right in front of me, I thought that he was going to hit me. All of a sudden, two people walked past and stopped near us. He said that we would meet again some other time and walked away. After this, I quickly drove home”.
Block 3A: Fear	“Sleeping was not possible last night, he could be standing at my door. I closed to blinds so he might think that I’m not at home. I think it’s scary to go outside alone. He can appear everywhere and who knows what he is going to do then. I’m going to avoid [that supermarket/those parties] in the coming period. I would very much like to go outside again without worries, so I hope that you can arrest him.”
Resilience 3B: Resilience	“Once I was home, I was very upset, but I’m not going to hide in my home. This is the last time that he bothers me like this. This morning I enrolled in a self-defence course, so I can protect myself better in the future. From now on, I can solve it myself. Next time, I’m not going to let me feel threatened like that anymore. I hope you can arrest him, so he will leave me alone from now on and I can move on.”
Block 4A: No prior police contacts	‘There are no registrations known in the police registration system for this victim. The victim, thus, has no prior police contacts.’
Block 4B: Prior police contacts as victim/witness	‘In the police registration system, the victim has the following police contacts: - Incident: Insult; Role: Victim; Date: 11-08-2019 - Incident: Fight/Brawl; Role: Witness; Date: 09-04-2019’

Table A2. Continued

Indicator	Text
Block 4C: Prior police contacts as suspect	'In the police registration system, the victim has the following police contacts: - Incident: Violation local ordinance by law; Role: Suspect; Date: 07-12-2019 - Incident: Driving under influence (alcohol); Role: Suspect; Date: 30-10-2019'

Table A3. Original Dutch texts vignette-blocks PC-scenario

Indicator	Text
Block 1A: Less risky lifestyle	“Ik fietste gisteren terug van mijn werk. Rond een uur of tien zat mijn avonddienst in bejaardentehuis erop. Ik was erg moe, dus ik wilde graag naar huis. Het grootste deel van mijn route gaat door een woonwijk bij het bejaardentehuis. Dat is de kortste weg, omdat je dan een stuk afsnijdt in vergelijking met de hoofdwegen. Aan de rand van die wijk ligt een rustig parkje. Bij de speeltuin in dat parkje gebeurde het.”
Block 1B: Risky lifestyle	“Ik fietste vannacht, ergens rond een uur of 5, terug van de kroeg. Elke vrijdag ga ik graag de stad in om het weekend in te luiden, gewoon even stoom afblazen. Ik had veel gedronken, sowieso tien bier en volgens mij ook nog wat shotjes. Ik wilde graag snel naar huis. Om een stuk af te snijden fiets ik altijd over een industrieterrein. Je hebt dan niet constant van die irritante stoplichten, dus het is veel sneller. Bij een van de bouwmarkten op dat industrieterrein gebeurde het.”
Block 2: Type of crime	“Uit het niets kwam er een scooter die recht voor mij stopte. Met geluk kon ik nog net op tijd remmen. De bestuurder van de scooter stapte af en liep naar mij toe. Ik moest mijn portemonnee en telefoon aan hem geven, zei hij. Ik kon niet goed zien hoe hij er uit zag, maar hij klonk jong. Hij stond tegenover me en zei dat ik maar beter de spullen kon geven, anders had ik een groot probleem. Volgens mij had hij een mes bij zich, ten minste ik zag iets schitteren. Ik voelde me bedreigd dus ik heb maar gedaan wat hij wilde, wie weet waartoe hij in staat was. Nadat ik hem mijn portemonnee en telefoon gaf, rende hij naar zijn scooter en reed weg. Het ging allemaal zo snel dat ik de kentekenplaat niet gezien heb.”
Block 3A: Fear	“Toen hij weg was ben ik snel naar huis gefietst. Ik heb geen oog dicht gedaan. Met moeite hield ik vanochtend mijn eten binnen. Ik weet niet of ik 's avonds nog alleen over straat durf te gaan. Misschien dat ik vanaf nu maar beter met iemand samen kan rijden. Ik blijf sowieso voorlopig uit de buurt van dat [parkje/industrieterrein]. Ik hoop dat jullie de dader te pakken kunnen krijgen, dan durf ik weer de straat op.”
Block 3B: Resilience	“Toen hij weg was ben ik snel naar huis gefietst. Ik voelde me verschrikkelijk, maar dit gaat mij niet klein krijgen. Volgende keer fiets ik gewoon weer door dat [parkje/industrieterrein]. Eigenlijk zou ik de dader duidelijk willen maken wat hij teweegbrengt bij andere mensen. Dat leert hem misschien wel om voortaan van andermans spullen af te blijven. Ik hoop dat jullie de dader kunnen pakken, zodat ik dat duidelijk kan maken en dit kan afsluiten.”
Block 4A: No prior police contacts	‘In BVH zijn geen registraties te vinden die gekoppeld zijn aan dit slachtoffer. Het slachtoffer heeft dus geen eerdere contacten met de politie gehad.’

Table A3. Continued

Indicator	Text
Block 4B: Prior police contacts as victim/witness	'In BVH zijn de volgende registraties te vinden bij dit slachtoffer: - Incident: Eenvoudig Mishandeling; Rol: Getuige; Datum: 04-12-2019 - Incident: Belediging; Rol: Slachtoffer; Datum: 16-09-2019'
Block 4C: Prior police contacts as suspect	'In BVH zijn de volgende registraties te vinden bij dit slachtoffer: - Incident: Rijden onder invloed (alcohol); Rol: Verdachte; Datum: 14-11-2019 - Incident: Rijden onder invloed (alcohol); Rol: Verdachte; Datum: 07-07-2019'

Table A4. Original Dutch texts vignette-blocks ST-scenario

Indicator	Text
Block 1A: Less risky lifestyle	“Gisteren liep ik iets na tien en terug naar mijn auto. Ik was net bij de supermarkt geweest. Omdat ik het vrij druk heb met mijn werk, moet ik vaker 's avonds laat boodschappen doen. Het is dan wel rustig in de supermarkt. Op de parkeerplaats stonden nog een paar auto's, verder was er niemand te zien. Ik stond bij mijn auto naar de sleutels te zoeken toen ik opeens iemand achter mij hoorde.”
Block 1B: Risky lifestyle	“Vannacht liep ik rond een of 4 terug van een techno-feestje. Die feestjes worden maandelijks georganiseerd en ik sla het zelden over. Ik had een stuk of zeven mix-drinkjes achter de kiezen, dus ik had best veel gedronken. Hoe dan ook, mijn fiets staat altijd in hetzelfde steegje, omdat daar meer plek is. Terwijl ik naar mijn fietssleutels aan het zoeken was, hoorde ik iemand achter mij.”
Block 2: Type of crime	“Ik herkende de stem meteen, het was een vriend van mijn zus. Hij klonk boos en vroeg waarom ik niet op zijn appjes reageerde. We zijn op een aantal dates geweest. Dat was gezellig, maar ik had er al snel een punt achter gezet. Hij wilde echter meer van me. Hij stuurt me nu al weken berichtjes en voicemail. Hij staat ook vaker [in de supermarkt/op feestjes] naar me te zoeken. Ik heb hem altijd weten te ontlopen, tot [gisteren/vannacht] dan. Ik zei dat hij hier echt mee moest ophouden en dat ik anders naar de politie zou gaan. Hierop werd hij alleen maar nog bozer. Hij stond recht voor me, ik dacht dat hij mij zou gaan slaan. Opeens liepen twee mensen langs die in de buurt bleven staan. Hij zei dat we elkaar nog wel een keer tegen zouden komen en liep toen weg. Ik ben daarna snel naar huis gereden.”
Block 3A: Fear	“Slapen zat er vannacht niet in, misschien stond hij wel bij me voor de deur. Ik heb alle rolluiken bij mij naar beneden gedaan, dan denkt hij misschien dat ik niet thuis ben. Ik vind het heel eng om alleen naar buiten te gaan. Hij kan overal opduiken en wie weet wat hij dan gaat doen. De komende tijd zal ik waarschijnlijk die [supermarkt/feestjes] vermijden. Ik zou graag weer zonder zorgen naar buiten willen gaan, dus ik hoop dat jullie hem op kunnen pakken.”
Block 3B: Resilience	“Eenmaal thuis was ik erg overstuur, maar ik ga mij nu niet in mijn huis verstoppen. Dit is de laatste keer dat hij mij zo lastig valt. Vanochtend heb ik me ingeschreven voor een weerbaarheidstraining, zodat ik mijzelf in de toekomst beter kan verdedigen. Dan kan ik het voortaan ook zelf oplossen. De volgende keer laat ik mij namelijk niet nog een keer zo bedreigen. Ik hoop dat jullie hem kunnen pakken, zodat hij mij voortaan gewoon met rust laat en ik verder kan gaan.”
Block 4A: No prior police contacts	‘In BVH zijn geen registraties te vinden die gekoppeld zijn aan dit slachtoffer. Het slachtoffer heeft dus geen eerdere contacten met de politie gehad.’

Table A4. Continued

Indicator	Text
Block 4B: Prior police contacts as victim/witness	'In BVH zijn de volgende registraties te vinden bij dit slachtoffer: - Incident: Belediging; Rol: Slachtoffer; Datum: 11-08-2019 - Incident: Vechtpartij (zonder vervolg); Rol: Getuige; Datum: 09-04-2019'
Block 4C: Prior police contacts as suspect	'In BVH zijn de volgende registraties te vinden bij dit slachtoffer: - Incident: Overtreding APV; Rol: Verdachte; Datum: 07-12-2019 - Incident: Rijden onder invloed (alcohol); Rol: Verdachte; Datum: 30-10-2019'

Table A5. Percentages and frequencies of the codes (identification of vulnerability)

Code/theme	PC		ST	
	N	%	N	%
Meanings				
Impact	15	55,6%	13	35,1%
Risk of (repeat) victimization	10	37,0%	15	40,5%
Indicators				
Consequences	19	70,4%	22	59,5%
Type of crime	10	37,0%	13	35,1%
Risky lifestyles	5	18,5%	2	5,4%
Individual characteristics	1	3,7%	9	24,3%
Pior police contacts	4	14,8%	2	5,4%
Total N	27		37	

Note: this table only includes the codes used in the vulnerability-judgements.

Table A6. Percentages and frequencies of the codes (role police officer and suggested protection measures)

Code/theme	V				NV				U			
	PC		ST		PC		ST		PC		ST	
	N	%	N	%	N	%	N	%	N	%	N	%
Role police officers												
Judicial role	13	48,1%	26	70,3%	6	40,0%	3	60,0%	1	11,1%	4	44,4%
Victim support role	21	77,8%	10	27,0%	6	40,0%	2	40,0%	4	44,4%	2	22,2%
Protection measures												
Internal referral	6	22,2%	16	43,2%	2	13,3%	3	60,0%	3	33,3%	2	22,2%
External referral	20	74,1%	22	59,5%	11	73,3%	4	80,0%	6	66,7%	6	66,7%
Other protection measures	7	25,9%	26	70,3%	5	33,3%	2	40,0%	3	33,3%	5	55,6%
Pysical measures	1	3,7	8	21,6%	-	-	1	20,0%	1	11,1%	1	11,1%
Victim measures	6	22,2%	14	37,8%	-	-	1	20,0%	2	22,2%	2	22,2%
Total N	27		37		15		5		9		9	

Appendix B: Supplementary tables Chapter 3

Table B1. List of crimes for the outcomes

Severe crimes	Less severe crimes
Street-robbery	Aggravated theft without violence from a residence
Robbery on a residence	Theft without violence from a residence
Robbery on cash transit van	Blackmail
Robbery on various objects	Theft with violence from a passenger car
Public indecency	Theft with violence from other vehicles
Rape	Aggravated theft with violence from a residence
Sexual assault	Aggravated theft with violence from a shop
Other sexual crimes	Aggravated theft with violence from a sport centre
Sexual abuse of a child	Aggravated theft with violence from an office building
Human trafficking	Aggravated theft with violence from other buildings
Human trafficking (sexual exploitation)	Theft with violence from a residence
Human trafficking (exploitation criminal activities)	Theft with violence from a shop
Human trafficking (other forms of exploitation)	Theft with violence from an office building
Stalking	Theft with violence (passenger car)
Manslaughter/murder	Theft with violence (moped)
Other violent crimes against a person’s life	Theft with violence (bicycle)
Aggravated assault	Other forms of theft with violence
Discrimination	Public acts of violence against persons
Incest	Threat
	Hostage/kidnapping
	Other crimes against personal freedom

Table B2. Logistic regression model for repeat victimization of severe crimes

	B		Exp(B)	Change in -2Loglikelihood
Intercept	-4.379		0.013	
Age	-0.032	***	0.969	45.818
Variation in types of victimization	0.293	***	1.340	15.609
Suspect sexual exploitation of children	1.503	*	4.494	2.018
Suspect driving with revoked driving license	0.732	**	2.080	4.802
Suspect human smuggling	3.848	***	46.906	9.307
Suspect violation restraining order	3.598	**	36.518	4.972
Suspect violation general municipal ordinance	0.164	*	1.178	3.786
Victim stalking	1.183	***	3.263	14.108
Victim insult	0.452	***	1.572	25.415
Victim other drug-offences	4.722	**	112.416	6.688
Witness abuse	0.565	***	1.759	15.593
Witness violence without follow-up	0.083	***	1.086	12.058
Witness complaint on police officers	2.539	*	12.672	3.061
Witness traffic accident with injury	1.027	***	2.792	14.176
Witness possession of soft-drugs	1.910	**	6.756	4.410
Witness missing	0.172	***	1.188	9.573
Witness unwell individual	0.533	**	1.705	8.309
Witness locating explosive	3.000	**	20.086	3.868
Witness examination declarant	0.177	*	1.194	5.222
Witness examination victim	5.326	***	205.637	7.845
-2Loglikelihood			2356.45	
Nagelkerke R ²			0.132	

Note: Training set n=34,224, * p < .05, ** p < .01, *** p < .001.

Table B3. Logistic regression model for repeat victimization of less severe crimes

	B		Exp(B)	Change in -2Loglikelihood
Intercept	-4.133		0.016	
Gender (ref.=male)	-0.278	**	0.757	12.244
Variation in types of victimization	0.265	***	1.304	27.366
Suspect human smuggling	2.562	**	12.961	6.512
Suspect producing/dealing hard-drugs	0.637	*	1.891	3.646
Victim abuse	0.231	**	1.260	6.665
Victim threat	0.429	***	1.535	16.379
Victim human trafficking	2.120	*	8.334	5.064
Victim aggravated theft without violence	0.491	**	1.634	7.244
Victim aggravated theft without violence from a residence	0.645	***	1.907	22.586
Victim embezzlement	0.410		1.507	5.795
Victim insult	0.260	**	1.297	10.815
Victim examination declarant	2.236	**	9.356	8.835
Witness abuse	0.341	***	1.406	11.749
Witness violence without follow-up	0.065	**	1.067	10.718
Witness threat	0.319	**	1.376	11.297
Witness fraud	0.631	***	1.880	18.473
Witness disorderly conduct	2.308	*	10.056	5.043
Witness railway accident	2.211	*	9.126	2.513
Witness unwell individual	0.352	**	1.422	5.656
Witness report	0.259	***	1.296	17.923
Witness retracting restraining order	3.386	*	29.558	4.022
-2Loglikelihood			6547.35	
Nagelkerke R ²			0.091	

Note: Training set n=34,224, * p < .05, ** p < .01, *** p < .001.

Table B4. Logistic regression model for repeat victimization combined

	B		Exp (B)	Change in -2 loglikelihood
Intercept	-3.715	***	.024	
Age	-.005	*	.995	6.502
Variation in types of victimization	.256	***	1.292	30.542
Suspect abuse	.175	*	1.192	5.348
Suspect aggravated theft without violence from a residence	.216	*	1.241	3.234
Suspect human smuggling	2.329	**	10.271	5.639
Suspect other traffic offences	2.149	**	8.576	5.663
Suspect railway incidents	2.869	**	17.612	6.579
Suspect producing/dealing hard-drugs	.566	*	1.762	3.579
Victim abuse	.268	**	1.307	10.797
Victim threat	.288	**	1.334	8.519
Victim stalking	.526	*	1.692	4.728
Victim human trafficking	1.677	*	5.351	3.539
Victim aggravated theft without violence	.428	**	1.535	8.212
Victim aggravated theft without violence from a residence home Residence	.441	***	1.554	13.754
Victim theft from a residence	.666	**	1.946	9.279
Victim embezzlement	.544	*	1.723	7.522
Victim fraud	-.536	*	.585	6.133
Victim insult	.395	***	1.485	27.577
Victim examination declarant	1.817	**	6.153	6.397
Witness abuse	.303	***	1.354	11.193
Witness violence without follow-up	.057	**	1.059	8.803
Witness threat	.303	***	1.354	11.746
Witness theft from a residence	-1.400	*	.247	9.584
Witness fraud	.512	***	1.668	12.931
Witness disorderly conduct	1.934	*	6.920	4.003
Witness railway accident	2.015		7.498	2.175
Witness unwell individual	.463	***	1.589	14.225
Witness concluding other reports	.054	**	1.056	5.951
Witness report	.172	**	1.188	9.669
Witness examination victim Injured Party	3.664	*	39.006	4.643

Table B4. Continued

	B		Exp (B)	Change in -2 loglikelihood
Witness imposing restraining order	.725	*	2.064	4.149
Witness retracting restraining order	3.205	*	24.665	3.708
-2 Loglikelihood	8363.081			
Nagelkerke R ²	0.097			

Note: Training set n=34,224, * p < .05, ** p < .01, *** p < .001.

Dankwoord

DANKWOORD

“En als alles achter de rug is, wil ik terug kunnen kijken en zeggen dat het gelukt is.”

Opgezwolle – Vraag & Antwoord

In de afgelopen acht jaar is dit dankwoord al duizend keer geschreven. Vaak tijdens het hardlopen, wanneer er geen computer of notitieboekje in de buurt was en alle ideeën lukraak in mijn bovenkamer bleven stuiteren. Bij deze dus mijn poging om dat allemaal voor eens en altijd vast te leggen.

Ergens in de intro van het Opgezwolle-nummer ‘Vraag & Antwoord’ zit de zin “die shit komt wanneer het af is”. In het nummer zelf refereert dat naar nieuwe muziek van de rapgroep, maar voor mij stond dit jarenlang in het teken van mijn proefschrift. Het werd een mantra om me op de been te houden, een reactie op insinuaties dat het allemaal wel erg lang duurde. Maar goed, het duurde ook wel lang. Acht jaar lang heeft dit proefschrift een centrale plek in mijn leven ingenomen. Het heeft mooie dingen met mij meegemaakt, maar het heeft ook de zware tijden gezien. In die periodes was het einde nauwelijks in zicht. Dat dit boekwerk er uiteindelijk toch is gekomen heeft niet alleen met mijn eigen koppigheid te maken. Het is te wijten aan een prachtige groep mensen om mij heen die mij direct en indirect steunden tijdens die hele proces. Ik hoop dat mijn dankbaarheid voor al die steun de afgelopen jaren al duidelijk is geworden. Zo niet, dan hoop ik dat nu aan jullie over te brengen.

Ten eerste wil ik mijn promotieteam bedanken voor jullie steun en kritische wijsheid. Alice, ik weet niet waar dit proefschrift zou zijn geweest zonder jou. In de afgelopen acht jaar ben je vaak mijn reddende engel geweest. Als het even niet ging, als ik vast kwam te zitten, als er weer een enorm obstakel op mijn pad kwam, was jij er altijd met wijze raad. Je was mijn gids door dit academische moeras en hebt mij heelhuids er doorheen geloodst. Dankjewel voor al je hulp, scherpe feedback en natuurlijk gezelligheid. Ik wens elke toekomstige promovendus een co-promotor (of promotor!!) zoals jou toe! Hopelijk kan ik jou en Joeri nog vaker vergezellen in het sfeervak van de Tilburg Trappers.

Toine, ironisch genoeg hebben wij elkaar voornamelijk via schermen gezien. Ik weet dus heel goed hoe jouw thuiskantoor eruitziet. Jij

stroomde halverwege het begin van de pandemie in als mijn eerste promotor. Daarmee ben je mijn tweede reddende engel. Mijn dank is nog altijd heel groot dat je bereid was om bij te springen. In de afgelopen jaren heb ik veel van jouw schrijfwijsheden en pragmatische houding geleerd. Als iemand die soms kan verzuipen in zijn eigen ideeën en langdradige teksten, is het fijn om een efficiënte tegenkracht te hebben. Ik durf te zeggen dat ik langzaam wat van je wijsheid zelf toepas. Al kan ik niet garanderen dat ik ooit echt kort van stof zal zijn.

Ron, aan het prille begin van dit hele traject was jij er al. Jij bent altijd mijn tweede promotor geweest, maar als toenmalig directeur van Praktikon was jij ook een klein beetje mijn baas. Meerdere malen hebben we op woensdagochtenden bij jou op het kantoor gezeten om te praten over het onderzoeksproject bij de politie en de proefschriften van Roos en mij. Hoewel ik die overleggen soms wel spannend vond, realiseer ik me dat ze ergens vormend waren. Ik raakte gewend aan het feit dat mensen kritische vragen hebben over je onderzoek en dat dit niet erg is. Sterker nog, je wil dat juist! Inmiddels word ik nerveus wanneer ik weinig tot geen kritische vragen krijg. Dank daarom voor je wijsheid en kritische vragen door de jaren heen.

Dan het team bij de politie! Jacqueline, zonder de inspanningen van jou en Toine Duffues was dit proefschrift er al helemaal niet geweest. Toen dit project langskwam was ik al een jaar of twee afgestudeerd. Eigenlijk had ik promoveren al afgeschreven. Je hebt me niet alleen de mogelijkheid geboden om alsnog promovendus te worden, maar je hebt me ook kennis laten maken met de wondere wereld van de politie. De ervaringen die ik bij de politie heb opgedaan alsmede de vele gesprekken met bevlogen politiemedewerkers zullen altijd bij mij blijven. Ik heb veel van jouw doorzettingsvermogen geleerd! Jouw terugkerende vraag 'Ja maar Niels, wat heeft de politie hier nou aan?' hield me steeds scherp om dit proefschrift ook praktische relevant te houden. Bedankt voor de kans om deel uit te maken van dit project en bedankt voor je begeleiding!

Miranda en Eltjo, ook aan jullie veel dank voor de gezelligheid, de samenwerking en al jullie kennis over de politiepraktijk en BVH. Jullie hebben mij geholpen om iets minder een *outsider* te zijn bij de politie en om dit onderzoek goed aan te laten sluiten bij de wondere wereld die de politie is.

Roos, zoals je in het dankwoord van je eigen proefschrift schreef waren wij een vreemd soort Siamese tweeling. We hadden dezelfde opleiding gedaan, hadden allebei stagegelopen bij Jacqueline, woonden allebei in Nijmegen en zaten ook nog eens in hetzelfde schuitje als buitenpromovendus. Onze introducties waren daardoor altijd vrij identiek. Tijdens voorstelrondjes was het altijd dringen wie van ons twee als eerste mocht. De ander had anders vrij weinig te vertellen. Wij zijn ieder onze eigen kant opgegaan na onze tijd bij de politie, maar het was fijn om in die eerste jaren een lotgenoot te hebben. Bedankt voor jouw scherpe kritische vragen, je gezelligheid en je geduld als ik weer een hele moeilijke SPSS-syntax wilde maken.

Mijn oud-collega's bij Praktikon en Intervict. Bij jullie was ik een beetje de buitenstaander die vooral bij borrels en kerstdiners aansloot. Een soort van uitvreter eigenlijk. Desondanks werd ik altijd met open armen ontvangen en dat waardeer ik enorm. Promotietrajecten kunnen vrij eenzaam zijn, dus die borrels en kerstdiners waren welkome afwisselingen. Naast dat ik jullie als hele fijne gezellige mensen heb leren kennen, hebben jullie mij ook geïnspireerd met de onderzoeken waar jullie mee bezig waren. Bedankt voor de open ontvangsten en de inspiratie!

Mijn oud-collega's bij Regioplan. Tussen 2022 en 2024 was ik die ene onderzoeker die in zijn vrije tijd zijn proefschrift af aan het ronden was. Ik dacht dat die dingen gescheiden zouden zijn, maar al snel realiseerde ik me dat kruisbestuivingen onvermijdelijk waren. Bedankt daarom voor alle lessen die ik jullie mij leerde over onderzoek doen. En natuurlijk ook bedankt voor alle gezelligheid bij de borrels en het geduld als ik weer over mijn proefschrift begon te praten. Gelukkig hoef ik jullie niet helemaal te missen, want ik hoor jullie stemmen thuis nog regelmatig uit de andere kamer komen.

Mijn huidige collega's bij de IBTD! Ook in het staartje van dit traject leer je nieuwe dingen. Dat blijkt uit de afgelopen twee jaar. Er waait een gedreven wind door de 28^{ste} verdieping van de Hoftoren. Die gedrevenheid heeft zich een weg gevonden in de manier waarop ik over mijn proefschrift praat én schrijf. Hoewel de academicus in mij nog steeds voorzichtig antwoordt, praat de onafhankelijke toezichthouder in mij iets duidelijker en gedreven. Dank jullie wel voor jullie betrokkenheid en nieuwsgierigheid naar mijn proefschrift. Ook bij jullie bedankt voor het geduld wanneer ik weer voor de zoveelste keer mijn lange betoog houd

over de nadelen van risicotaxatie instrumenten en algoritmes. Dat betoog zal nog vaak herhaald worden, ik blijf natuurlijk een *‘tikkeltje eigenwijs’*.

Naast mijn leven in het onderzoek begeef ik mij ook onder de mensen. Hoewel dat ook vaak onderzoekers zijn, hebben we het gelukkig niet alleen maar over rapporten, regressieanalyses en orthogonaal roteren. Deze mensen hebben mij de afgelopen jaren enorm op de been gehouden:

Mijn paranimfen, Wesley en Joost. Toen ik twee paranimfen moest kiezen had ik drie criteria: ze moesten kalm zijn, praktisch ingestoken en kunnen inschatten wanneer ik overvraagd en geïrriteerd raak. Jullie voldoen dus beide aan die voorwaarden. Met jullie twee als rugdekking kan ik de wereld (of ten minste mijn verdediging) helemaal aan!

Wesley, al bijna vijftien jaar lang ben je een kalme en stabiele aanwezigheid in mijn leven. We hebben zelfs ooit een woonadres gedeeld! Tijdens de pandemie belde jij vaak om bij te praten. Ik was op de een of andere manier altijd aan het afwassen. Je was dan altijd een luisterend oor, maar ook iemand die mij een spiegel voorhield. Ook zonder pandemie ben je dat gelukkig! Je houdt mij scherp en inspireert mij stiekem om wat relaxter in het leven te staan en mijn eigen plan te trekken. Dankjewel voor al die steun, wijsheid en telefoontjes als ik aan het afwassen was!

Joost, hoeveel mensen zouden al gek zijn geworden van ons? Als we samenkomen ontstaat er een snelkookpan aan veel te specifieke grappen, quotes van sketches (*‘Wie is Kees Brusse nou weer?’*) of tips voor nieuwe bands. Voor sommigen is dat leuk, voor anderen kan het niet snel genoeg stoppen. Logischerwijs zit ik in die eerste categorie! Dankjewel voor jouw humor, optimisme, jouw advies en hulp (je hebt immers ook een van de vignetten ingesproken)! Dat we nog veel mensen gek mogen maken, en dat Bonk ook deel wordt van dit complot.

Mijn Dungeons & Dragons-groep, Yves, Lucas en (opnieuw) Joost. Wat ooit begon als een excuus om overdag samen bier te drinken, is uitgegroeid tot zoveel meer. Onze D&D sessies waren al vaker een bron van afleiding. Of dat nou van het isolement van de pandemie was, break-ups, werkstress of een proefschrift, zodra we aan een tafel zaten met een uitdijende collectie aan veelkleurige dobbelstenen waren we in een andere wereld. Een wereld waar we al die zorgen even vergaten, onszelf voor schut zetten en elkaar irriteerden. Dat alles om dan rond een uur of 9 's avonds aangeschoten Swans mee te zingen (TOUSSAINT!!

L'OUVERTURE!!!!). We delen lief en leed met elkaar, kibbelen als een vierkoppig getrouwd stel en slapen op Best Kept Secret in één tent, ook als een getrouwd stel. Van de grond van mijn hart: dank voor al jullie gezelligheid, vreugde, gekkigheid en, ook bij jullie, geduld wanneer ik weer eens mopperend binnenkom.

De Toet de Droef, mijn droefstoeters: Gideon, Thijs, Wouter, Twan, Roland, Stefan, Bas, Milan (zoon) en opnieuw Wesley, Joost, Yves en Lucas. We hebben misschien onze wilde haren verloren (sommigen zelfs letterlijk), maar dat zegt niets over ons gedrag. Een clown definieert zich namelijk niet aan zijn kapsel, maar aan zijn neus en schoenen. Onze neuzen zijn nog steeds rood en onze schoenen veel te groot. Diep van binnen zijn we dus nog steeds dezelfde clowns en dat maakt me heel blij. In de afgelopen acht jaar waren onze clowneske avonturen (zowel nieuw als oud) voor mij een motor om door te zetten. Tegenover elke tegenslag stonden vaak drie verhalen of ervaringen waar meerdere van jullie bij betrokken waren. Bedankt dat jullie dat licht brachten! Op naar nieuwe clownerijen en nog meer 'bier voor morgen'.

Rosanne, Roos, lief, dr. Schaap. Wat een geluk dat ik twee jaar terug de laatste trein naar Nijmegen gemist had. Jij hebt alleen het laatste deel van dit proefschrift meegemaakt, maar zonder jou was ik nu nog altijd bezig met al het werk uitstellen. Als geen ander weet je mijn stugge koppigheid te doorbreken. Je daagt mij uit om het beste uit mijzelf te halen en iets voor mekaar te krijgen. Je bent mijn grootste motivator, steunpilaar en cheerleader. Je lacht ook nog altijd om mijn domme grapjes en onnauwkeurige pogingen tot een Amsterdams of Hoorns accent. Voor al deze dingen en meer ben ik jou oneindig dankbaar! Ik ben blij dat jij op dit belangrijke moment naast me staat. Wat een feest om nu samen met jou in ons huis in Haarlem 'dr.' te zijn!

Tonia, mijn nep-moeder. Misschien heb je niet altijd een beeld gehad van wat dit proefschrift inhield of betekende, maar indirect heb je geholpen om het af te maken. Ik mag mij gelukkig prijzen dat ik al van jongs af aan omringd ben door mensen die hard werken, gepassioneerd zijn om anderen te helpen en tussendoor ook nog veel lol hebben. Jij hebt me geleerd om onzin uit te halen en de luchtige kant van het leven in te zien! Dankjewel daarvoor. Het maakt de zware tijden toch een stuk dragelijker als je iets vindt om over te lachen. Dat je op je 71^{ste} de ongein nog niet verloren bent, geeft me hoop!

Mam, oorspronkelijk wilden pap en jij niet naar de verdediging komen om mij 'niet nerveus te maken'. Gelukkig heb ik duidelijk kunnen maken dat jullie wel degelijk verwacht worden, op de eerste rij zelfs! Hoewel een stoel op die rij leeg zal blijven, brengt het me veel plezier om jou daar te zullen zien zitten. Je zei altijd dat ik cum laude afgestudeerd was in het vak 'hoe maak ik mijn moeder gek?', dus ik vind het ook fijn dat je mijn andere academische prestaties ziet (al zullen die waarschijnlijk niet cum laude zijn). Net zoals Tonia heb je me geleerd om hard te werken en te blijven lachen, ook als er even niet zo veel te lachen valt. Dankjewel daarvoor, ook zonder jou was dit allemaal niet gelukt!

Pap, helaas ben je niet meer onder ons. Je zei dat je altijd wel op een manier aanwezig zou zijn, dus ik hoop dat je nu kan zien dat het gelukt is: het is proefschrift is af! Zonder jou was dit niet gelukt. Je hebt me geleerd om kritisch en nieuwsgierig te zijn, om fatsoenlijk en respectvol te blijven en om door te zetten. Tegen de achtergrond van veel pijn, verdriet en ziekenhuisbezoeken zag ik hoe jij streed, hoe jij van het leven wilde genieten en hoe jij steeds weer wilde focussen op wat wél mogelijk was. Die veerkracht is voor mij altijd olie op het vuur geweest om door te gaan, wat er ook op mijn pad kwam en welke tegenslagen er ook waren. Het heeft mij dit boekwerk gebracht, een leuke baan, een huis en wie weet wat nog meer. Het is een vuur dat altijd zal blijven branden en wat ik hopelijk net zoals jou door kan geven. Ik mis je elke dag en op dit soort momenten nog iets meer. Met trots draag ik onze familienaam. Bedankt voor alles!

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