Governance by pilot projects: Experimenting with surveillance in Dutch crime control
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Citation for published version (APA):

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1. Introduction
I.

Introduction

‘Just Do It’

Unorthodox pilot studies in the field of crime control have been lauded, and subsidised, by the Dutch government since the late 1990s. As a result, a variety of surveillance technologies have been introduced in security and crime prevention practices. Such practices include the use of facial recognition technology at national borders, as well as advanced statistical techniques to prevent minor crimes and misdemeanours. The language is often strong. Policy makers talk about ‘having guts’ and argue that when it comes to trying out new technology, you should ‘just do it’. Experimenting has become an almost standard reply when it comes to solving problems in crime control:

> I would prioritise just starting with a number of interesting experiments ... It is good to learn about your limitations, for instance, when it maybe becomes too risky. And, yes, by experimenting you also learn about opportunities. And, next, I think your priority as a government is to consider your core tasks. And which tasks can you share? So you - it really is a reconsideration of the things, uhm, the things you cannot pass on, and where you can be much more open, and, with that, you can use these developments [in information technologies]. (Valerie Frissen, Professor, ICT and Social Change, October 14, 2010)

The above quote is taken from an opening speech at the National Innovation Forum, Safe Society 2.0 in Scheveningen, a conference for crime control professionals I attended as part of the fieldwork for this thesis. The main aim of the conference was to discuss the potential of information and communication technologies (ICTs) for crime control.

The quote introduces the topic of this thesis project well: technology experiments with the objective of preventing minor crimes and improving community safety. I focus on the ‘pilot study’. Pilot studies test an innovation by using it ‘in the spirit of experimentality’ for a restricted period in a field setting, such as a police station or a shopping centre (Vreugdenhil et al., 2010). They are expected to lead to future improvements, permanent usage or wider dissemination. Typically, actors from different fields cooperate in pilot studies. In crime control, they involve actors from such fields as policing, public transport, corporate consultancy and academic research.

As the quote indicates, however, experimental practices not only concern testing whether a device works or not. The speaker also mentions their role in defining government tasks. Technology experiments are also social experiments. Technologies such as, for instance, intelligent camera supervision, can introduce new types of suspects, behavioural norms,
and require new working routines for security officials. Moreover, the effect of applying the technology may not be undone when an experiment ends. Crime control practitioners widely acknowledge this. Yet the experimental capacity to cross normative boundaries remains under acknowledged.

Such concerns are especially relevant in relation to the group of surveillance technologies examined in this thesis. Surveillance technologies collect, store and analyse data about people and things with the aim of influencing, managing, protecting or directing them (Lyon, 2007, p. 14). They enable policy makers, police officers and other professionals to provide safety and care. Yet it has also been pointed out that they enforce the exclusion of marginalised groups (Monahan, 2006), increase data collection without clear suspicion, and threaten personal and collective liberties such as entering public space without being monitored (Amoore, 2008). The above concerns, however, are rarely raised in such formal and informal experimentation. ‘Just do it’ has become an important guiding motto. We seem to live in an experimental society where we learn about the benefits and risks of surveillance technologies by trying things out. This is as true for individuals installing a new app on a smartphone as it is for governments using data mining.

I examine pilots of surveillance technologies from the idea that experiments do not discover, but constitute realities. This view on pilots is well-established in Science and Technology Studies (STS), the main social science field informing this thesis. Consequently, we may assume that pilots in crime control do not just establish whether a technology functions well. They constitute what surveillance technologies observe, and thereby who or what should be monitored, how, and by whom. It is therefore relevant to know how contemporary experiments in crime control operate.

This requires engagement in experimental practices ‘in action’. For this thesis project I therefore conducted ethnographic research on three pilot studies in Dutch crime control as they unfolded. These pilots concerned acoustic aggression detection used by local police at a bus station; data mining used by local government policy makers; and Codemark, a spray with traceable liquid (‘synthetic DNA’) used by ticket inspectors in public transport to mark suspects of assault.

My central question is: *How do surveillance technologies and crime governance affect each other in experimental practices?* Or, simply: what happens when surveillance technologies are introduced in crime control? The phrasing of the question indicates my intention to understand how technology and crime governance develop together, not taking either technology or the domain of practice as wholly one determining the other. I refer to crime governance as the ongoing practices of making crime ‘measurable and manageable’ (Amoore and De Goede, 2005, p. 149). These include constituting, for instance, who are to be suspects, and who are to be the authorities (Rose and Valverde, 1998).
The word ‘how’ in this question can be interpreted in two ways, and both will be addressed. First, the how-question addresses the processes and practices of experimenting, in this case those of doing a pilot. I am interested in what sort of activities are part of the pilot, for instance, how evidence is produced, how technologies are made to work, and how audiences are convinced (I will also refer to this as the ‘operation’ of pilots). Second, I ask ‘how’ in terms of what sort of changes pilot studies produce in crime governance and surveillance technology. Think, for instance, of shifts in what counts as suspicious behaviour and who is authorised to intervene.

The chapters that follow are versions of academic articles published in, or under review of academic journals and an edited book. I have not modified the articles after submission or publication, with the exception of minor edits. Being able to address varying academic audiences is a privilege. However, the reader will also find that, as a consequence, the above question is addressed differently in each chapter. I hope that the chapters nevertheless remain consistent enough for an enjoyable reading experience.

In the remainder of this introduction I provide a background to the chapters. I first introduce the broad theoretical shifts in thinking about surveillance technologies (following this introduction, each chapter will also present a specified theoretical framework). Next, I introduce experimenting as a topic of social science inquiry and clarify why and how studying experiments might contribute to this debate. I then discuss the specific branch of STS informing my analysis: actor-network theory (ANT). This is followed by a discussion of the fieldwork I conducted. Finally, I present a brief outline of the chapters.

**Debate: Surveillance and Crime Governance**

*‘New’ and ‘Old’ Surveillance*

Since the final decades of the 1900s ever more technologies have been introduced in our everyday lives to capture information about people and their behaviour. As a result of steady developments in ICT and the biological and forensic sciences, such technologies seem to affect social life differently than, for instance, paper databases. Therefore, Gary T. Marx refers to their usage as ‘the new surveillance’ (2002). This is a useful place to start an introduction to the literature on contemporary surveillance. Marx argues that ‘new’ surveillance technologies operate more intensively and extensively. Their operation is understood to be more intensive because technologies such as camera supervision and biometrics are part of ever more domains of social life, such as the workplace, border controls and consumption. Because old barriers can be transcended, such as distance and microscopic size, intimate information becomes available for analysis. Data that before were not revealing in themselves can now be given meaning as a consequence of the combination of data sources and enhanced analytical capacity.
New surveillance technologies seem more extensive, G.T. Marx argues, because they capture and store larger volumes of information, operate in larger networks of actors, and are combined with other technologies. Data can be captured at a distance and transmitted in seconds.

The development and introduction of these technologies pre-dates September 11, 2001. In the Netherlands, government budget cuts, increasing crime rates and populist politics had already initiated a policy focus on the application and development of surveillance technologies in the 1980s. September 11 was an incentive, however, for the introduction of more data collection technologies for national security. The new technologies and practices eventually trickled down to more mundane crime control practices.

An illustration of the new surveillance is the use of facial recognition. Following pilot studies in border control, pilots on facial recognition were initiated in several Dutch supermarkets. In the research project that eventually led up to this thesis, I showed how facial recognition was used to combat the rather mundane problem of shop theft. The technology compared the faces of individuals in the crowd to police photos of known shoplifters. The supermarket manager was alerted when a match was established between a database photo and that person entering the shop. The example shows how detailed information about an essential part of daily life, doing one’s daily groceries, was captured and recorded in the name of crime control. It shows that data was shared by the police and the supermarket, which allowed the police to keep track of the supermarket from a distance (Grommé, 2012).

We should keep in mind, however, that the break with ‘older’ surveillance practices in modern democracies is not as sharp as G.T Marx’s concept indicates. Surveillance, high-tech or low-tech, has always been part of everyday life. Think of records kept by schools and workplace surveillance. Keeping track of, and thereby constituting populations is crucial to state building (Scott, 1995). This includes the surveillance of colonised territories that served as the laboratories for surveillance in the colonising states (McCoy, 2009). From a Weberian point of view, state systems of surveillance, such as enumeration, furthermore ensured the development of rational and disciplined bureaucracies. State-centred, mass surveillance practices facilitate the state to operate and control at a distance; considered by Giddens as a crucial aspect of modernity. Finally, Dandeker (1990) reminds us that the ‘old surveillance’ is relevant for life in modern societies. In our contemporary individualised ‘societies of strangers’, we rely on the state and its surveillance. The break between old and new serves to indicate a need to study surveillance that is not part of centralised government practices, without discrediting the relevance of the latter.
From Institutions to Assemblages

To analyse social changes associated with surveillance technologies, since the past decade scholarly work has increasingly subscribed to varieties of assemblage theory (Ball, 2011), by which it is understood that technologies operate in a complex of heterogeneous actors that include organisations, regulations and other technologies (Haggerty, 2006; Lyon, 2006). I briefly discuss how these theories developed via the work of Michel Foucault, Gilles Deleuze and Félix Guattari before identifying my research problem in the next section.

Michel Foucault famously proposed to study heterogeneous ensembles in his work on governmentality. Modern government is an ‘ensemble of institutions, procedures, analysis, [and] tactics that allow a complex form of power over the population’ (Foucault, 1994, p. 219). Governmentality is an ‘art of government’, in which power is not a given ‘thing’, but the effect of the use of techniques and methods. Scientific and professional knowledge from domains such as psychology and medicine produced populations as ‘natural phenomena’, articulating the norms of conduct characterising them (Foucault, 2009). Think, for instance, of occurrences of disease or crime. The power this art of government produces is not repressive, but internalised and enacted by individuals. Biopower, as Foucault refers to it, works not through repression but freedom. It enables within the norms of conduct.

Crucially, this technology of government followed and complements disciplinary power, a concept put forward by Foucault to describe the operation of government that has developed since the late seventeenth century (Foucault, 1995). This embodied and internalised form of micro-power is based on the observational and regulatory techniques of institutions such as prisons, hospitals and work floors. The Panopticon was originally introduced by Foucault as a metaphor for the disciplinary micro-power exerted by institutions.

The adoption of Foucault’s work on governmentality in surveillance studies and other social science fields is relevant because it allows for a decentralised understanding of the operation of surveillance technology beyond the confined spaces of institutions. Gilles Deleuze and Félix Guattari build on these insights in their conceptualisation of the assemblage. They propose the metaphor of the rhizome. The rhizome is a root structure of weeds without central order or hierarchy. Any point may be connected to another. Never stabilised or finished, rhizomes are always in the process of becoming without beginning or end (Deleuze and Guattari, 2012). We find these ideas again in Postscript on the Societies of Control, where Deleuze develops and expands Foucault’s notion of governmentality, taking into account modern ICTs (1992). Deleuze paints a picture of a society in which ‘control is short-term and of rapid rates of turnover, but also continuous and without limit, while discipline is of long duration, infinite and discontinuous’ (p. 7). The disciplines are modified, as illustrated by the image of a changed practice of punishment, where prisons are replaced by electronic collars that do not confine but regulate a person.
Adopting these insights in their much-cited theory of contemporary surveillance, Kevin Haggerty and Richard Ericson suggest that the ‘surveillant assemblage’, as they call it, is a heterogeneous gathering of loosely connected actors, such as people, institutions, technologies and knowledge (Haggerty and Ericson, 2000). It is a unity to the extent that the actors may work together as a ‘visualising device’ for a target population. The rhizome thus explains how surveillance spreads as a practice over society, yet operates in a decentralised and fragmented way.

In work using assemblage theories, surveillance technologies are attributed several roles in changing systems and cultures of crime control in the industrialised world. Generally, the state has retracted, including a wider variety of actors in governance. This has broadened the reach of crime control. At the same time tolerance for minor offences and deviancies has declined, exemplified by a drop in tolerance for anti-social behaviour and minor crimes (Garland, 2001).

I return to the specifics of the Dutch situation later in this introduction. Here I first explain the roles attributed to surveillance technologies in these developments. I focus on the field of surveillance studies. First, it is argued that surveillance technologies capture and abstract information. They can do so from a distance, continuously and automatically. This enables an increased focus on the body as a source of truth. The facilitated extraction of personal information enables and enforces risk prevention strategies in which information is used to predict and prevent risky behaviour (Adey, 2004; Bogard, 2011).

Second, surveillance technologies may link government domains since they can be easily connected. For instance, they integrate information systems when consumer databases, social security databases and police information systems are combined to create a profile for a specific individual (Haggerty and Ericson, 2000). This also allows the state to retreat, accompanied by an increased effort to both monitor and steer from a distance (Garland, 2001). Thus, private actors, such as private security companies, increasingly acquire formal and legal competences in crime governance.

Third, surveillance technologies code, categorise and sort (Lyon, 2003, 2007; Ball and Haggerty, 2005). Hardware and software systems, such as databases, are argued to regulate and control because they contain coded fields for categorisation. Therefore surveillance technologies ‘control by code’ (Lyon, 2007, pp. 99-100). The consequences are relevant, as those categorised and coded are often marginalised groups. This is a consequence of the way that preferences for these groups (ethnic, gender and social-economic) are designed into the technology (Magnet, 2011) and the practical categories used by their operators (Introna and Wood, 2004).
Research Problem

The above discussion points out that in current work about surveillance assemblages, technology functions mostly in its capacity to smoothly extract information, link, code and sort. There is room for additional insights regarding the conceptualisations of the operation of technology in socio-technical assemblages.

Consider, for instance, the previously mentioned example of facial recognition in a supermarket. Facial recognition was intended to facilitate the automated sorting of the risk category of previously arrested, frequent offenders. It linked police and supermarket databases. However, introducing the technology at this site caused frictions. It required local security guards to change their understanding of who is a suspect of crime control. They needed to adjust their practices from preventing known shoplifters from entering the supermarket, to letting them enter the supermarket in order to be recorded by the facial recognition technology and subsequently get arrested by the police. The project team did not achieve these rearrangements and as a result the technology was not introduced. Finally, supermarket management decided to repurpose the technology to detect the theft of goods instead (Grommé, 2012).

The example indicates that capturing information, coding, linking and sorting do not capture the complex rearrangements that occur when a technology is introduced. We know little about the new suspect identities and authorities that emerge with new technologies. The extensive network of local knowledge and artefacts necessary to put technology to use is not addressed (Dubbeld, 2005). Such aspects may have received little attention because various adoptions of assemblage theory have privileged an understanding of surveillance in terms of knowledge and information flows (Ball, 2002), rather than local practices.

Another possible reason is that frictions and failures are understood as integral, not inhibiting, features of the expansion of rhizomatic assemblages (De Goede, 2012; Deleuze and Guattari, 2012). The field acknowledges that technologies do not always work in their full capacity to collect information. Authors acknowledge that the number of linkages between organisations may be limited, as some actors will keep databases to themselves (Norris, 2005). Those under surveillance may avoid monitoring and develop counter-surveillance practices (Mann et al., 2003). Yet what technologies do in practice has led to relatively little reflection on how they affect and rearrange crime governance in assemblages.

I intend to address the rearrangements in crime control and technologies with the question ‘How do surveillance technologies and crime governance affect each other in experimental practices?’ Addressing this question is empirically relevant because we know little about how technology introductions affect crime control, for instance, how they affect local practices and how suspect identities are brought into being. It is theoretically relevant because it is an opportunity to develop additional insights into surveillance technologies.
As I point out in the next section, this may contribute to STS as well. The point of addressing the fragilities of surveillance technologies is not to argue that they are ineffective, or to propose a theoretical alternative to assemblage theories. It is to expand our repertoires for thinking about surveillance technologies in relation to crime governance.

Contributions

I aim to contribute to two social science fields: STS and surveillance studies. Please note, however, that the specific debates to which the individual chapters of this thesis contribute will not always respect the (blurred) boundaries of these fields.

To surveillance studies I aim to contribute a situated account of the operation of surveillance technologies in crime governance that addresses fragilities and ambiguities, while acknowledging the transformational capacity of technology. The insights contextualise surveillance and may thereby contribute to a conceptual understanding of surveillance. Such insights may concern the temporalities of surveillance, varieties of practice, and unexpected interactions, frictions and failures. In Kirstie Ball’s words, to address local, contested and politicised places might add to broader conceptualisations of surveillance (2002).

To STS I firstly intend to contribute a relevant empirical repertoire for thinking about how technologies affect identities, individual liberties and social justice. Although STS research has addressed various domains of practice related to everyday crime control, such as forensic practice (M’charek, 2005; Toom, 2010) and the court room (Jasanoff, 1998), less work has been done on the work of technology in crime control in mundane settings such as trams and policy offices. Such settings are nevertheless relevant to learn about the not-quite scientific, and not-quite lay knowledge informing technology adoption in crime governance.

Secondly, this study provides an account of an experimental practice that crosses public and private boundaries. Although well-versed in accounts of laboratory experiments and organised collective experiments outside of the laboratory, less attention had gone out to the off-hand, everyday practices of experimenting that have become part of policy making.

An issue relevant to both fields is the introduction of surveillance technologies in all parts of everyday life in a more or less experimental manner. Even when the context of operation is not a formal experiment, we might say that we adopt many surveillance technologies, such as apps that collect our personal information, in our individual lives while being aware that we do not fully understand the consequences of the large scale data collection they facilitate. It has become common practice for technology developers to introduce their products in beta versions. A well-known example is Google Glass that allowed users to access the Internet and take in information through a pair of spectacles. Google Glass was only available as an experiment for a short period, yet was an item of frequent media coverage and intellectual speculation in its short life.
1.

**Studying Experiments**

*Why Study Experiments?*

Experimenting is not the exclusive privilege of laboratory scientists, and it has never been (Latour, 1990b; Rottenburg, 2009). It can also refer to putting something on trial or adopting a course of action in uncertainty of whether it will serve the aim (Oxford English Dictionary, 2009). Generally, experiments are conducted to discover something unknown. Everyone experiments, including policy makers, children and teenagers.

Authors in STS and related social science fields draw our attention to the transformative power of experiments. ‘Give me a laboratory and I will raise the world’, Bruno Latour stated (Latour, 1982, p. 142). We learn that the experiment derives part of its power (be it in the domain of policy, art, science or elsewhere) from a consensus on the experiment as a legitimate means to arrive at the truth.9 The classic experimental method has its roots in the 17th century Scientific Revolution (Shapin and Schaffer, 1985). It relies on maintaining a separation between the laboratory and the outside world; controlling all circumstances; standardising method; staging convincing demonstrations to appropriate witnesses; and providing testimonies in writing that could travel outside of the laboratory (Latour, 1990b; Shapin and Schaffer, 1985).

Other models and practices of experiment have developed since. Hybrid forms, for instance, also rely on techniques to enhance visual or other sensory experiences (Reno, 2011) or on theatrical techniques (Lezaun et al., 2012).10 Real-world experiments, such as pilot studies, purposefully let go of controlled circumstances as a technique to learn about the unexpected (Gross and Krohn, 2005; Guggenheim, 2012). Experiments may operate in new ways, but they often continue to draw on classic experimental techniques, such as witnessing (Krohn and Weyer, 1994).

I briefly mention three social science aims of studying experiments in various fields of practice, including medicine, policy and crime governance. Scholars usually do not restrict themselves to a single aim. I separate the aims here to clarify why studying experiments is a relevant pursuit, and to later clarify my position in this thesis.

First, it is argued that experimentation can serve social amelioration if executed correctly. Such arguments have been put forward by authors from various theoretical backgrounds. Donald Campbell is one of the earliest proponents of policy experiments. He argued that policy experiments transgress the boundaries of standardised, routine and partial policy making. He made a case to deploy experimental methods such as control groups to improve policy evaluation (1969). Today, authors often discuss experiments as potential contributions towards sustainable development. Placing experiments in the context of reflexive modernity, John Grin and Johan Bos argue that they can contribute to systemic change (2008).11 Noortje Marres argues that public sustainability experiments can generate new publics through their engagement with materiality (2012).
A relevant line of thought in the social amelioration approach is to adopt the experiment as a democratic mode of operation. An important inspiration is John Dewey, who proposed thinking of democratic government as inherently experimental (2012 [1927]). He proposed treating programmes and institutions as ‘working hypotheses’, always to be monitored and adjusted (p. 127) and allowing for ‘degrees of blindness and accident’ (p. 70). An example of a contemporary application of Dewey’s work can be found in Maarten Hajer and Emily Gomart’s argument for politics as experiment, that is, as a way of being open to and generating surprise. This approach, the authors argue, also shows that politics (like experimental practice) is situated in material conditions of learning (2003). Conflict and frictions generated in experiments, argue Michel Callon, Pierre Lascoumes and Yannick Barthe, also have democratic potential because they allow minority identities to emerge and gain a voice (2011). In an applied approach, finally, experimenting has been proposed as a model for the introduction and management of high-risk technologies such as nuclear power. The experiment, it is argued, is a valuable model because it implies a sensitivity to incremental social change (Taebi et al., 2012).

Second, experiments have been studied from the standpoint of potential harm to research subjects and their environments. Such arguments develop in various ways. Wolfgang Krohn and Wolfgang van den Daele claim that experiments with genetically modified organisms generate knowledge about health risks that should be the basis of such implementations (Krohn and Van den Daele, 1998). Experimenting is also associated with repressive political power. In the field of security and crime control, they demonstrate sovereignty (Boyle and Haggerty, 2009). Postcolonial authorship has introduced the term ‘experimentality’ to refer to the practice of using untested medicine in the Global South on patients that at times have no choice but to participate (Rottenburg, 2009). Experimentality is a take on Foucault’s governmentality, emphasising the experiment as an assemblage of knowledge and practices that enlist experimental subjects in a regime of biopower (Towghi and Vora, 2014). Finally, policy experiments are scrutinised because many initiatives, not in the least those funded with government money, do not lead to clear results or accountable documentation (Jowell, 2003; Vreugdenhil, 2010).

The Position of the Experiment in this Thesis

I identify with a third aim, this is to denaturalise the experiment. In STS and related fields it is argued that the social is implicated in constituting scientific knowledge, and that we should therefore learn about the politics of knowledge production. Empirical studies of laboratory work, policy experiments and experimental demonstrations elsewhere show that professional hierarchies and politics (Collins, 1999; Sims, 1999), funding structures and coping strategies (Knorr-Cetina, 1981), and political and religious orders (Barnes and Bloor,
1982; Shapin and Schaffer, 1985) play a role in what comes to count as truth. What is more, experiments maintain and reproduce particular notions of gender (Haraway, 1997) and race (M’charek, 2005). As explained in the next section, I draw on a particular branch of this work: actor-network theory (ANT).

Experiments have various functions in the analyses presented in this book. The main role is conceptual: experiments do not reveal, but produce the realities of crime governance. They do so by rearranging technology in its socio-technical networks. This also informs my view of the surveillance technologies operated in pilot studies: they constitute their objects.

Experiment is also the object of study. I will attempt to describe the processes and practices that are part of the pilot study as a mode of experimentation. This mode of experimentation blurs corporate, government and scientific logics of evidence. Finally, the experiment is the empirical moment to observe the rearrangements that occur when surveillance technologies move from the laboratory to sites of practice.

To conclude, my position on studying experimentation is both critical and analytical. Evidently, safety and security are valuable social goods, worth our continued efforts to improve them. However, experimentation in crime control also threatens fragile liberties. Pilot studies are partly driven by commercial interests, which may inhibit the application of transparent means of witnessing and testimony. Finally, pilot studies are often thought of as temporary, inconsequential runner-up phases to the ‘actual’ final application. I do not mean to argue that all forms of experimentation are potentially harmful. Still, critically examining a variety of experimental forms may give insight into the limitations of experimentation to unequivocally benefit the social good. In this sense, the book can be read as an intervention into thinking about experimentation.

**Performativity, Relationality, Multiplicity and Partiality in Post-ANT**

**ANT and Post-ANT**

I connect with actor-network theory to study surveillance experiments. In his classic work *The Pasteurisation of France* (1993a), Bruno Latour shows that Pasteur did not discover the microbe. He brought the microbe into existence. The bacillus, so we learn, only exists in a stable network of human and non-human actors in the laboratory. This network includes petri dishes, nutritional cultures, trained lab hands and fellow scientists. Pasteur’s accomplishment was to establish associations between all these entities. This is the work of translation. For instance, ‘illness as a problem of poverty’ had to be translated into ‘illness as a problem of sanitation’ in order to makes associations between the hygiene movement and the Pasteurians.
Of particular interest for this thesis is the moment Pasteur leaves the laboratory. He invited a number of sceptics to a farm to show the effects of penicillin in an experiment. We learn that

\[ \text{The setting works like a giant ‘optical device’ that creates a new laboratory, a new type of vision and a new phenomenon to look at. … Pasteur works as much on the scene and on the plot. What counts in the end is a simple visual perception: dead unvaccinated sheep versus alive vaccinated sheep. (Latour, 1990a, p. 17)} \]

This example makes salient that experimenters do not simply make discoveries or generate surprises, be it in terms of a new natural law, or in terms of obstacle to a technology at work. Making the microbe exist outside the laboratory required the experimenters to engage in the extensive work of demonstrating to interest, convince and ‘enrol’ others in the network.\(^{16}\)

This is one example from a varied body of work in ANT about scientific, quasi-scientific and non-scientific practices that show that entities come into being through practices. This is referred to as performativity.\(^{17}\) Their dependence on practices does not make these entities, or objects as I call them, any less real. In Bruno Latour’s words, objects are ‘simultaneously real, discursive, and social’ (1993b, p. 64).

In this thesis I draw on such authors as Annemarie Mol, Amade M’charek, John Law and Donna Haraway. I refer to their field of work as ‘post-ANT’, a field drawing on material-semiotic approaches and intertwined with feminist STS (see Law and Hassard, 1999). As will become clear in this thesis, this is a line of work particularly emphasising the complexity, heterogeneity and dynamic nature of collectives. It is also especially sensitive to entities that are marginalised, as opposed to a focus on how dominance and durability are achieved. The particularities of my approach are detailed in the individual chapters. Here I restrict myself to an outline of key concepts and ideas.

Besides performativity, a key concept in my usage of ANT is relationality: objects derive their properties from relations with other objects. This is not to say that words only derive their meaning from relations with other words. Instead, a material-semiotic network of artefacts, bodies of knowledge, routines, and so on, enact the ontological status of entities (M’charek, 2008; Mol, 2010). For the field of crime control this means that what a shoplifter is exactly depends on the collectives mobilised at a specific time and place. In a supermarket this may involve camera images displaying nervousness, gender stereotypes and the nature of the product that has disappeared. In a psychologist’s office, however, this may include a file of previous sessions and diagnostic knowledge of kleptomania.

Relationality also extends to the nature and operation of the technology. Technologies are not ‘materialised knowledge’ or tools that help human actors accomplish their aims. They acquire their capacity in relation with other entities, such as artefacts, bodies of knowledge and humans. Technologies can greatly affect the world around them,
but what they do depends on their relations with other actors (M’charek, 2008b; Pols, 2011). To refer to ‘surveillance technologies’, then, is not to say that a technology will necessarily and only monitor or collect data.

In relation to the above, an important concept is multiplicity: the various ways in which objects are brought into being by different practices, yet still ‘hang together’ (Law, 2002; Mol, 2002). This allows for a move away from the attention to standardisation, stabilisation and dominance of actor-networks characterising early ANT (Mol and Law, 2002). Ambiguity now becomes an object of study next to standardisation and singularity (Singleton and Michael, 1993). Objects, such as race, can be fragile and contingent, yet also persistent and deserving of our attention (M’charek, 2010).

Finally, I adopt partiality as a key concept in my usage of post-ANT. Relationality and performativity indicate that objects come into being in relation to the dispositions of bodies, relations to others, instrumentation and other aspects of specific material and cultural settings. Consequently, observers are not separated from the world to acquire objective knowledge; ‘vision from nowhere and everywhere, equally and fully’ does not exist (Haraway, 1991, p. 191). All knowledge is therefore partial. As the individual chapters of this thesis will show, these insights can be meaningfully extended to the operation of surveillance technologies. These technologies do not produce perfect knowledges but need to be made to work in relation to a myriad of other actors to produce partial ‘visions’ (Latour and Hermant, 2006; Gad and Lauritsen, 2009).

**Rearrangements in Crime Governance**

From Latour’s account of Pasteur we learn that rearrangements are needed when surveillance technologies are moved out of controlled spaces into every day crime governance. In the absence of the standardised equipment of laboratory demonstrations, we might expect rearrangements to be achieved differently (or in fact, they might not be achieved at all). It is therefore interesting to learn how this is done, and what sort of rearrangements in crime governance takes.

I refer to crime governance as the continued accomplishment of making crime ‘measurable and manageable’ (Amoore and De Goede, 2005, p. 149). I specifically focus on the rearrangement of objects, authorities, norms and spaces that are part of the order of operation in crime control (Rose and Valverde, 1998). Objects of intervention are the targets of policy, law, and regulation in crime governance. I understand these as entities that are brought into being through and with surveillance technologies. The object of intervention can be a type of behaviour, such as aggression, a type of person, such as a frequent offender, or any other criminal phenomenon. By authorities I refer to those who are endowed with mandates, responsibilities and competences in crime governance, including work floor employees. For example, a local city government may change its position on crime governance if it can
gather information about problem youth independently from the police. Governable spaces are the intended ‘sites of intervention’. Governable spaces can be physically delineated, geographic areas, but can also refer to a policy domain or a social space. The norms of crime governance, finally, refer to the enactment of commonly accepted guidelines for action. Among others, I include norms in my analysis that are encoded in laws, by-laws and regulations, and non-encoded norms that guide people in their everyday routines.

I introduce these terms mainly as focal points, to make the analysis more concrete, not to limit or standardise it. These four aspects will be interwoven through the chapters, depending on their relevance to the case studies. The final article refers to crime governance as the practice of ordering the futures of making crime manageable and measurable.

The Study: Ethnographies of Pilots

The Netherlands

The outcomes of research, as John Law states, are the results of specific engagements and entanglements. This is because doing research entails intervening, ordering and bringing into being realities according to a selection of methods, tools, research techniques and guiding concepts (2004). I mention this here because it is relevant to the research design of this project, namely, three case studies in the Netherlands. I will not treat the Netherlands, or the individual cases, as representations of a generalisable phenomenon, for instance, as an effect of ‘the neo-liberalisation’ of crime governance. Each case is the result of my engagement with it. Nevertheless, the cases might very well be partially connected with practices elsewhere, be it in the UK, Belgium, or in the next city (Jensen and Lauritsen, 2005).

My choice for studying the Netherlands derives from my concern with developments in the field of crime prevention and security and technology deployment in this country. Dutch crime governance has changed considerably since 2001. The change had already started in the 1980s, when crime control gained relevance as a political theme and policy preoccupation (Schuilenburg and Van Swaaningen, 2013). The discourse changed from a concern with crime as a public order, into a concern with justice (Peeters and Schuilenburg, 2014). Although more moderated, many of the policies and practices from Anglo-Saxon countries travelled to the Netherlands. A culture of punitiveness and risk prevention has developed in Dutch crime control (Boutellier, 2002), increasingly focusing on minor crimes and misdemeanours (cf. Boutellier et al., 2009). While crime control reaches out to ever more parts of daily life, the Dutch state actively attempts to transfer responsibilities to private actors. As part of this policy, it gradually affords more policing competences to the growing private security sector (Van Steden, 2007).
With regard to technology, Dutch policy generally aspires to a forerunner role in the area of technology usage and innovation (cf. Schinkel, 2009). Unorthodoxy and experimentality have been lauded especially and subsidised, since the presentation of the ‘Towards a safer society’ (Naar een veiliger samenleving) policy programme in 2002 (Ministerie van Binnenlandse Zaken and Ministerie van Justitie, 2002; cf. Commissie Criminaliteit en Technologie, 2005). Laws and regulations have been adapted to permit the use of possibly privacy-infringing, new technologies (Koops, 2011). As a result, a variety of surveillance technologies have been introduced in security and crime prevention practices. Examples are licence plate recognition at city borders, biometrics at national borders (Dijstelbloem and Meijer, 2008; Van der Ploeg, 1999), and camera supervision in public transport (Dubbeld, 2005). Technologies are also increasingly linked, as is exemplified by the biometric databases in the Schengen context (Prins, 2011).

Three Case Studies: A Meaningful Ensemble

I did research on three pilot studies conducted between August 2010 and July 2012. The cases were chosen to form a ‘meaningful ensemble’ of experimental practices and technologies (Muniesa and Linhardt, 2011, p. 564). Each case presents a pilot study of a ‘new surveillance’ technology (Marx, 2002), and therefore all can be made meaningful in relation to each other. Yet, their differences can be used to specify and interrogate varieties in new surveillance practices.

With regard to their similarities, all pilot studies were concerned with regulating behaviour in urban public space. In particular they focussed on minor offences, an area targeted by ‘unorthodox’ measures and policies. I chose to focus on practices that were at least at some point referred to as pilot studies. I considered this to be a relevant experimental practice because pilots take place at the intersection of corporate, government and academic practices. Finally, all cases were considered innovative to some extent; thereby excluding routine introductions or policy evaluations.

The first case concerns a pilot study of aggression detection in policing. Aggression detection is a sensory technology aimed at measuring bodily traits, in this case sounds produced by the body in a state of anger. The technology was installed at a bus station and connected to a camera surveillance system. The main participants in the pilot were a local police station, a local government and a corporate technology provider. This pilot study was conducted mainly by letting the technology run.

The second case, a pilot study of data mining, introduced a statistical technique and software to a policy-making practice. Data mining analysts promise to find patterns in large amounts of data. In this case government, police and commercial data were combined to produce new insights into ‘problem youth’. The participants were a regional policy platform
for public-private innovation, a local department for community safety and a corporate technology provider and data analyst. The main pilot activities were the development of a database and meetings to test and discuss the software.

In the third case, a pilot study tested a technology for forensic identification in public transport. Codemark, a liquid marker containing synthetic DNA was carried in spray cans by ticket inspectors, who could thus mark assailants. This potentially enabled the police to connect a suspect to an offence. This surveillance technology works in another way than the previous two cases. The liquid marker was introduced with a narrative of surveillance; it was to prevent assault by conveying the idea that everybody is watched and can always be found among passengers. Publication and communication drawing on the forensic capacities of real DNA was intended to make potential perpetrators avoid criminal behaviour. In another storyline, the liquid lights up under the UV light in nightclubs, thereby exposing a person to the gaze of their peers. An urban public transport company (a newly privatised authority) and the corporate provider of this technology were the main participants.

**Ethnography of Pilots**

I conducted ethnographic fieldwork to learn about the rearrangements and frictions usually left out of official reports and evaluation studies. This enabled me to consider the outcomes of experiments (be it failure, success or neither) as grounded in routines, strategies and artefacts deployed at the site of practice (Latour and Woolgar, 1986). Ethnographic fieldwork typically combines a variety of methods to understand the *in situ* practices of actors and to understand these from their social and material lifeworlds. This method therefore does not presume to achieve distant observation but is based on the experiences of the observer (Clifford, 1983).

Besides observations, this study is based on interviews and document study. Typically, ethnographies develop in relation to encounters in the field (M’charek, 2005; Hine, 2007). This means that the details of the ethnography mentioned here are as much an outcome of the study as a method. In the following I mention some of the considerations and insights into doing an ethnography of a pilot project, instead of an ongoing practice.

A relevant consideration was when and where to be present. At an early stage of research I learned that my informants were not always explicitly ‘doing the pilot’. Pilot studies entail integrating a technology into routines. Only at pilot meetings, demonstrations, and moments of explicit failure or success was the pilot an activity separate from daily routines. I therefore chose to attend both to the routines and the explicit pilot moments. To follow their progress, I spread my research activities over the lifespan of the pilots (14 to 18 months).
I learned about the routine practices on the field sites by doing stretches of observation at various moments. I observed police control room practices; spent days at a policy office as an intern; accompanied police officers and ticket inspectors on their rounds; did a bike tour around a neighbourhood with a case worker; visited neighbourhood meetings; and spent time at bus stations and in trams. I also conducted interviews during which I sometimes asked informants to give me demonstrations and tutorials. These activities allowed me to take into account the routines and materials used, however mundane they seemed: from software to paper maps and pens.26

Another consideration regards the boundaries of the pilot: where does it begin and end? And who takes part? I generally spread my attention over technical and scientific experts, policy staff and operational staff such as police officers and ticket inspectors because they are all part the performance of crime governance with technology (Barry, 2001). Two remarks are relevant here. First, it is evident that I was continuously engaged in constituting the boundaries of the pilot together with informants. For instance, at times my informants stretched my boundaries, as they invited me to meetings that I had not previously considered relevant (I discuss the shaping of the pilot as an organisational object in Chapter 5). A second relevant issue was if and how I would include the intended targets of surveillance. It should be noted here that in two of the cases, aggression detection and data mining, those under surveillance were not informed and did not act as participants in the cases. Although it is relevant to give them a voice, I decided not to do so in these cases. To illustrate, in the case of data mining, a case worker happened to point to some youths on the street quite at random, asking me whether I wanted to talk to them. At the time, I did not feel that I should involve them actively in my surveillance. In the liquid marker pilot, however, travellers in public transport actively asserted themselves and including them in my research did not implicate them further in surveillance.

A final consideration is my position in the field and how I communicate about this. In all three case studies my contacts securing access were employees with the organisations testing the technology. However, I also maintained relations with the corporate providers of the technology. During my observation and interviews I always introduced myself as a researcher. Because I moved between different organisations and ranks, I sometimes assured my informants that I was not funded by an external organisation, but by the University of Amsterdam to do independent research.

An especially relevant aspect regarding my position in the field is my agreement to anonymity for the persons and organisations in the pilot studies.27 In two of the cases I signed confidentiality agreements. This is why I use fictional names for places, organisations, products and persons. Also, I refrain from naming primary documents that can be easily retraced. In this practice I base myself on the code of conduct for using personal data by the Dutch Social Sciences Council (KNAW, 2003) and the code of conduct of my institute, the Amsterdam Institute of Social Science Research (AISSR). These two codes formalise the generally accepted practice of protecting the livelihoods and positions of informants.28
**The Chapters**

Each chapter presents a different approach to the question of how surveillance technology and crime governance affect one another in experimental practices. Together they present a progressive writing process, in which the emphasis shifts between the operation of pilot studies (the processes and practices) and their results in terms of rearrangements.

Chapter 2 discusses the acoustic aggression detection pilot study conducted by a local police station. Aggression is not a legal object of intervention. In Dutch criminal law, one is allowed to be aggressive, but not to hurt others. Yet aggression was introduced as an explicit police target when the equipment was installed at a bus station. In this chapter I ask how various actors constitute aggression as a sound object. My interest is in how the pilot study operates as a process and practice. We learn that this practice is best approached as ‘tinkering’ (Knorr 1979; Knorr-Cetina, 1981).

Chapter 3 switches the focus to a local policy department for community safety, where a pilot study of data mining was conducted. The participants aimed to learn if this technology can help users ‘zoom in’ on problem youth to provide a more detailed understanding of their behaviour. Drawing on Marilyn Strathern’s ‘partial connections’ (2005) and Donna Haraway’s metaphor of ‘vision’ (1991), the chapter argues against the assumption that increasing volumes of data can generate ever more accurate close-ups of problem youth. I ask how ‘zooming in’ is accomplished in the data mining pilot, and what norms are embedded in and produced through these practices. In this chapter, the role of the experiment shifts to an empirical resource for understanding the situated usage of surveillance technologies.

I continue to focus on the role of surveillance technologies in constituting identities in Chapter 4. I develop this theme by not only taking the surveillance by officials into account, but also the surveillance by citizens. The case is Codemark, a traceable liquid intended to mark suspects of assault in trams. In semi-public spaces such as trams citizen take part in the daily negotiations about acceptable authorities and justifiable interventions (for instance, are ticket inspectors legitimate authorities?). As ever more technologies are employed in public spaces, these may constrain the daily negotiations. I approach this issue by asking how the liquid marker affected passenger and ticket inspector identities in their mutual surveillance. I used Rolland Munro’s notion of ‘motility’ (2004) to understand the continuous shifts and rearticulations of identity.

In Chapter 5 the focus shifts back to the process and practices of the experiment. Experimental practices, such as pilot studies, are increasingly applied to guide policy makers in decisions about a technology’s promises and uncertainties. Yet we know little about the organisational format of the pilot study and its consequences for the potentialities afforded by surveillance technologies. What does it mean to govern by pilots? I address this question by examining the pilot as an organisational object, and following how it is constituted.
The Conclusion discusses the outcomes of the four studies together. I argue that we should understand pilots studies with surveillance technologies as means of governance in which surveillance practices are executed and rearranged by the, often temporary, application of technologies. With this argument I mean to draw attention to the role of pilots in rearranging crime governance, articulating futures, performing surveillance, and producing truths. It highlights the variety of roles the introduction of surveillance technology plays in crime governance, and the exclusions, ambiguities and frictions of this process.

Notes

1. In the Netherlands this field of crime control is referred to as ‘social safety’ (*sociale veiligheid*). The most accurate English translation is community safety. Dutch social safety policies, however, focus less on the ‘community’ as the unit to be protected and mobilised and are more oriented towards improving (the experience of) personal security in public space.
2. See the discussion of actor-network theory in this chapter for more about technology.
3. This is by no means a comprehensive overview of the relations between surveillance and the constitution of modern states. For a more comprehensive treatment, see Dandeker (1990).
4. Specific formations are also referred to as dispositifs or apparatuses (Foucault, 2009).
5. Michel Foucault’s Panopticon has been extensively applied to analyse contemporary technologies. Mann et al. (2003), for instance, argue that we live in a neo-panopticon as a consequence of organisations possessing more means of observation than individual citizens.
6. See also Ball (2011) and Van der Ploeg (1999; 2003) for other accounts of contemporary surveillance technologies and the body.
7. Police forces have also increasingly adopted corporate, target-oriented New Public Management techniques (Garland, 2001).
8. There are exceptions, of course. See, for instance, Gates (2010) and Timan and Oudshoorn (2012).
9. Experiments have not always been accepted as a method reflecting reality; see Shapin and Schaffer (1985).
10. Barry shows that demonstration can be a scientific and a political activity (Barry, 2001).
11. See also Schot and Geels (2008); Callon (2009); and Callon, Lascoumes and Yannick (2011).
12. See also Lindblom (1959) and Stone (1997).
13. Consider also the notion of tinkering as a mode of operation to gradually improve healthcare (as opposed to ceteris paribus experimentation), put forward by Mol (2006) and Mol, Moser and Pols (2010).
15. See the edited collection of Boutellier et al. (2009) for detailed accounts of how surveillance practices affect the possibilities to meet, organise and express oneself in public spaces.

17. This is different from symbolic interactionist notions of performance. Symbolic interactionist work distinguishes between performance and actual meaning and status (Goffman, 1959; Goffman, 1966). To mark the difference in such approaches, Annemarie Mol uses the term ‘enactment’ to refer to how entities are brought into being (2002). I use the terms ‘constituting’, ‘performing’ and ‘enacting’, intertwingly. In my cases, entities often do not obtain a durable status yet. Intuitively, enactment does not capture this non-routine status.

18. Rose and Valverde use ‘subjects’ instead of ‘objects’ in their original article to refer to those monitored in crime governance (1998). Here I adopt the vocabulary of STS to refer to objects as the interest and outcome of knowledge practices. In Chapters 3 and 4 I address objects in terms of their identities.

19. Crime governance and surveillance are closely related concepts, and I do not intend to suggest they can be separated. This thesis demonstrates that learning about crime governance as an ordering of objects, norms, authorities and spaces is informative about surveillance practices.

20. Policing practices travel between the Netherlands and other countries, as Den Boer points out (2004).

21. The Netherlands is a safe country. Registered crime has dropped by 17% between 2007 and 2013. Nevertheless, one in five residents reported having been a victim of mostly minor criminal offences (veelvoorkomende criminaliteit) in 2013 (De Heer-de Lange and Kalidien, 2014).

22. Comparative research is scarce, but when comparing The Netherlands to the UK, it is assumed that proposed punitive and preventive measure take a more moderate form. Van Steden and Jones (2010) argue that this is caused by a (welfare) state-centred attitude to crime control and a decision-making culture characterised by compromise.

23. Technology innovation is considered a market opportunity; hence the provision of economic incentives by the Dutch state.

24. With regard to case selection, I learned of two of the pilot studies at crime control and security conferences. My interest in the liquid marker pilot was sparked by its media coverage. Practical considerations were naturally relevant, especially timing because I would study the pilots in real-time. Another practical consideration was scope. The cases needed to be local because studying three nationwide cases ethnographically was not possible within the time span and resources of this PhD project. Access did not affect selection because all contacts I approached were willing to cooperate.

25. See also Clifford (1983) and Beaulieu (2010) on presence in the field.
26. I conducted 32 interviews and 45 observations (days, shifts or meetings) as part of the case studies. Among the interviews I count scheduled meetings with informants. Besides the case studies, as part of the field work I conducted 12 scoping expert interviews, and attended four professional conferences on crime control in the Netherlands. At times the interviews were formal, at other times they were conversations over coffee. I did not count phone calls for updates or unscheduled casual chats during observations, although these are empirically relevant. The interview length varied from half an hour to three-and-a-half hours (in the case of a walk) and were generally semi-structured. The duration of observations varied from two-hour meetings to eight-hour working days. Relevant documents include policy documents, research papers and project documentation.

27. Fieldwork reports can be requested from the author on the basis of confidentiality.

28. These agreements did not stop me from pursuing my research aims. See Simakova (2010) on the relevance of doing research on corporate technologies. I discuss the topic in more detail in the data mining case study.