



Co-Producing Local Security

a quantitative research on how co-production activities affect the level of objective and subjective security in the Netherlands

A.M.G. Huisman, MSc

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Supervisor: Dr. J. Matthys

Second reader: Dr. M.C.A. Liem

Leiden University

Faculty of Governance and Global Affairs

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Summary

Over the past decades, the Dutch police has actively invested in co-production activities in order to prevent and fight crime within the Netherlands (Management of Finance & Control, 2017; Peper & Korthals, 1998; Van Steden, 2009). In the security domain, co-production activities are defined as activities in which police officers and citizens cooperate with each other to achieve the common goal of fostering neighbourhood security (Rosenbaum, 1987; Van Eijk, Steen & Verschuere, 2017). Although co-production has been a widely studied method (Brandsen & Honingh, 2016; Voorberg, Bekkers & Tummers, 2014), little is known about whether co-production activities contribute to the level of both objective and subjective security of citizens living in the Netherlands.

Given that there are challenges and risks associated with co-production, it is relevant to know whether co-production is an effective tool in obtaining either objective or subjective security. The necessity to investigate this is underlined by the fact that the Dutch police system is very decentralised (Peper & Korthals, 1998; Van Rijn, 2011; VNG, 2018), which means that the level of security is highly dependent on the work of local police officers. Acknowledging this context, this study aims to answer the following question: *how do co-production activities affect the level of objective and subjective security in the Netherlands?*

Based on the theoretical framework, this study expects that co-production activities positively affect the level of objective and subjective security. In case of subjective security, this effect is expected to be both direct, and indirect through the variables social cohesion and trust in the police. To test whether these expectations are valid, this study has used data from CBS and WABP, and the statistical technique of structural equation modelling (SEM) to find out which mechanisms explain how co-production activities affect security in the Netherlands.

The regression output of the model with the best fit statistics showed that co-production activities indeed positively affect the level of objective security. Additional analyses showed that this effect is not dependent upon the type of co-production. Subjective security, on the other hand, was only positively affected through increased social cohesion. The direct effect of co-production on the level of subjective security was negative. Additional analyses indicated that the effect co-production has on subjective security is dependent upon the type of co-production.

Given these results, this study concludes that the way co-production activities affect security is dependent upon the dimension of security and the type of co-production. Whilst co-production activities are generally expected to increase the level of objective security, varying forms of co-production could affect the level of subjective security differently. These findings have important implications for both the academic literature and those involved in co-production activities.

1. Introduction

1.1 Introduction to Co-Producing Security

During the 1980s, co-production became the centrepiece of national programmes that aimed to increase security in high-crime neighbourhoods throughout the United States of America (Garofalo & McLeod, 1989). In general, co-production means that both public professionals and citizens contribute to the provision and quality of public services (Van Eijk et al., 2017). The core objective of practicing co-production in case of neighbourhood security is to mobilise citizens as a human resource to foster local security (Rosenbaum, 1987). Over the years, the idea of co-producing security has gained popularity across a wide range of OECD countries, including, but not limited to, Australia, Canada, and the United Kingdom (Bennett, Holloway & Farrington, 2008; Garofalo & McLeod, 1989).

Since the 1990s, the Dutch government has also actively invested in co-production activities to prevent crime and improve neighbourhood security within the Netherlands (Terpstra, 2010; Van Steden, 2009). In 1993, the Dutch government presented an integrated approach to security issues, stating that citizens should actively contribute to reducing crime (Ministry of the Interior and Kingdom Relations [BZK], 1993). According to the report, “there has been increasing support for the idea that the government cannot do everything and that an individual contribution from citizens [...] would be appropriate” (BZK, 1993, p. 18). In the years thereafter, the Dutch government encouraged voluntary participation of citizens on the local level, because it believed that “[c]itizens themselves can make an important contribution to achieving security and effective police care in our country” (Peper & Korthals, 1998, p. 15).

More recently, the Dutch police has emphasised the importance of citizen involvement in its multi-annual strategies. For instance, the security strategy of 2011-2015 stipulated that citizens need to be engaged in crime fighting, because citizens could hold information that is necessary to solve criminal cases (Haage & Tersteeg, 2011). Similarly, the security strategy of 2015-2018 paid attention to the involvement of citizens, describing that active citizens could help to catch criminals in the act by participating in neighbourhood watch schemes (Opstelten, 2014). According to the current security strategy of 2018-2022, police officers want to be approachable and stay in close contact with citizens to increase their willingness to report criminal activities (Management of Finance & Control, 2017). Due to the recurring emphasis on citizen involvement, co-production activities have become a permanent component of the working method of the Dutch police force.

1.2 Problem Definition and Research Question

Although co-production has been widely studied as a method in various policy domains (Brandsen & Honingh, 2016; Voorberg et al., 2014), the evidence base for co-production is considered to be relatively weak (Loeffler & Bovaird, 2016; Nabatchi, Sicilia & Sancino, 2017). While scholars have researched what motivates citizens to start co-producing security, and how public professionals and citizens perceive each other's contributions (Van Eijk et al., 2017; Van Eijk, 2018), little is known about whether co-production activities also contribute to an increase in the level of security.

Given that the approach of the Dutch police has resulted in a variety of co-production activities that aim to foster security, it is valuable to understand *how* these activities affect the level of security. Especially in the Dutch context, a country in which the police system is very decentralised and the level of security is highly dependent on the work of local police officers (Peper & Korthals, 1998; Van Rijn, 2011; VNG, 2018), it is important to know how cooperating with citizens on the local level works out. The importance of investigating the relationship between co-production and security is underlined by two potential risks associated with co-production in the security domain, being that co-production could: (1) obstruct police investigations when citizens report details they believe to have witnessed while they were only suggested to them by other citizens (Loftus, 2005), and (2) decrease the level of perceived security among citizens once they become more aware of illegal activities taking place in their neighbourhood (Zedner, 2000). Acknowledging these risks, this research examines what effect co-production activities have on the level of security in the Netherlands. The research question reads: *how do co-production activities affect the level of objective and subjective security in the Netherlands?*

As will be explained in more detail in Chapter 2, this study defines co-production activities in the security domain as those activities in which citizens and public professionals collectively aim to increase security of a neighbourhood through cooperation. Increasing security could concern either the 'real' level of security (objective security) or the perceived level of security (subjective security) by the citizens living in Dutch neighbourhoods.

1.3 Academic and Practical Relevance

Investigating this topic is academically relevant because the field of security studies often focusses on the privatisation of security (see e.g. Krahmman, 2008; White, 2011), causing co-production activities to remain largely undiscussed in this field of study. Looking at co-production activities could help in understanding how the level of security is affected and whether such activities are an effective tool to reach certain security goals. Gaining insight into the relationship between co-

production and security also holds practical relevance, because knowing how co-production affects security helps to determine the desirability of co-production activities in the context of local security. The following sections further discuss the relevance of this study.

1.3.1 Academic Relevance

In the field of local security, little is known about whether, and if so how, co-production helps to achieve the objective of increasing security (Loeffler & Bovaird, 2016; Nabatchi et al., 2017). Knowing this is relevant for academics of security studies, because it helps with understanding what factors influence both the objective and subjective security of citizens. Additionally, for academics of public administration, having such knowledge about co-production is relevant when researching how co-production works out in other policy domains, such as health or education.

Alongside its content, the process of this research is also academically relevant, because of: (1) the multidisciplinary approach, (2) the quantitative methods, and (3) the focus on causal mechanisms. The multidisciplinary approach means that this research applies theories from a range of fields within social science to the security domain. As the field of security studies is considered to be relatively new, integrating literature from other social sciences could provide new insights and enlarge the scope of the security discipline. By borrowing theories from disciplines as criminology, public administration, and economics, this research comes to a comprehensive approach to security. This is of academic relevance, as a comprehensive approach provides researchers with a broader understanding of the phenomenon of co-producing security.

With regard to the research methods, this study aims to contribute to the academic literature by using a quantitative approach to define the relationship between co-production and security. In the academic literature on co-production, scholars have primarily used qualitative methods and often lack quantitative evidence (Verschuere, Brandsen & Pestoff, 2012; Van Eijk, 2018). This research seeks to fill this gap by using the method of structural equation modelling (SEM) - a statistical tool that can be used to analytically reconstruct reality (Kline, 2011). By assessing how co-production affects security through SEM, this study aims to find out whether co-production activities are an effective tool to increase security. The quantitative approach helps to structurally assess whether the hypothesised direct and indirect relationships between co-production activities and security are significant. Although quantitative methods are usually known for their focus on effect sizes, SEM can also be used to test varying mechanisms (Kline, 2011). Given these features, this study is a valuable addition to the current research on co-production and security.

1.3.2 Practical Relevance

This study also holds practical relevance, because the desirability of co-production activities depends on whether or not these activities increase the level of security. Taking into account the previously described potential risks associated with co-production and the investments that are necessary to establish co-production activities (e.g. human capital, communication structures, trainings), gaining more insight in how these activities contribute to security is valuable for society. When co-production appears to be an ineffective strategy to increase security, both police officers and citizens could decide to spend their time and effort differently. Contrarily, if proven to be effective, this observation could not only motivate current participants to keep on co-producing, but could also incentivise the start co-production in areas where it is currently absent.

Furthermore, finding out through which mechanisms co-production affects security could help to optimise the approach of the Dutch police to increase the level of security. For instance, co-production might indirectly affect subjective security of citizens through trust in the police. Awareness of specific mechanisms like these is valuable for police officers, because it enables them to know how they can increase subjective security. This study examines these mechanisms by including additional variables that are expected to determine and mediate the relationship between co-production and security. Understanding these underlying mechanisms could also help in achieving other governmental objectives. For instance, if co-production activities contribute to social cohesion, the Dutch government could choose to invest in these activities, even if these activities do not result in more subjective security. As such, this study will lead to practical advice for the Dutch government and local police units on whether, and if so how, co-production could be used to achieve local security and potentially other objectives.

1.4 Research Structure

This study is structured in several chapters. Firstly, the theoretical framework will provide an overview of the academic literature on co-production, especially in the domain of security, and discuss what effect co-production is expected to have on security (Chapter 2). Then, the chapter on research design will justify the choice for a large-N design, and explain how the key variables are operationalised (Chapter 3). Afterwards, the research methods will be outlined by clarifying how data is collected, processed and analysed (Chapter 4). Subsequently, the results of the data analysis are presented (Chapter 5). This study concludes with some final remarks, study limitations, and suggestions for future research (Chapter 6) and a discussion on its academic and practical implications (Chapter 7). The references and appendices are included at the end of this study.

2. Theoretical Framework

Over the past decades, the way in which the provision of public services is organised has been subject to change. Whereas public services were traditionally solely provided by government, governmental entities nowadays regularly cooperate with other actors, including citizens, to foresee in the provision of public services. This chapter discusses this trend and will then elaborate on one form of public services provision, being co-production. Moreover, it explains what co-production looks like in the domain of neighbourhood security and establishes hypotheses pertaining to how co-production activities are expected to affect the level of both objective and subjective security.

2.1 The Provision of Public Services

After World War II, public organisations of European governments started to expand their provision of public services (Peters & Pierre, 1998). Alongside their core goal of regulating public security, governments aimed to counter social and economic inequality by investing in education and healthcare (Boyle & Harris, 2009; Iacovino, Barsanti & Cinquini, 2017). At that time, public services were still solely provided by public organisations (Boyle & Harris, 2009; Peters & Pierre, 1998). Specifically in the Netherlands, a country that was characterised by its societal structure of pillarisation, social institutions provided a great variety of public services to the citizens that were part of their pillar (Lijphart, 2007). These services included education and healthcare, but also housing, sports and news broadcasts. While this structure helped citizens to recover from World War II, citizens had only little say in the politics of their pillar, because the elite groups of the pillars cooperated with each other and decided on the policies without consulting their citizens (Lijphart, 2007). This form of politics is known as consociationalism (in Dutch: *pacificatiepolitiek*).

The era of pillarisation and consociationalism came to an end in the Netherlands during the 1970s. Due to growing dissatisfaction among citizens about their limited influence, the country became increasingly secular (Lijphart, 2007). Despite the fact that consociationalism ended in 1973, citizens were used to the public services provided to them, which meant that governmental entities were expected to keep on facilitating these services (Lijphart, 2007). However, both in the Netherlands and in other European countries, the growth in public service provision and the associated costs soon became unmaintainable for governmental entities (Moynihan & Thomas, 2013; Bovaird, 2007; Hood, 1991).

In the 1980s, public organisations therefore started to prioritise economic growth and moved towards practices of New Public Management (NPM) to make public services more effective and cost-efficient (Boyle & Harris, 2009; Hood, 1991). Business-oriented styles of managing and

organising public services led to the privatisation of these services (Boyle & Harris, 2009; Robichau, 2011). For instance, the United Kingdom privatised multiple public transport and water companies during the mid-80s (Bakker, 2001; Bourn, 1995), and the Dutch government privatised its fixed-line operator PTT in 1989 (Davids, 1999). Although the NPM approach resulted in cost reductions, the outsourcing of public services undermined “innovation, flexibility and learning, and the ability of any public service organization to achieve its objectives creatively and effectively” (Boyle & Harris, 2009, p. 8). Consequently, change was deemed necessary to “free up the concrete structures and procedures of public services to make them more effective and cost-efficient” (Boyle & Harris, 2009, p. 5).

This desire to change led to the rise of a new form of governance, called New Public Governance (NPG). The NPG model is based on a network approach: public agencies interact with other organisations within their network to jointly produce public services (Brandsen & Honingh, 2013). Where citizens were previously treated as customers during the NPM era, government entities started to treat citizens as partners and began to actively cooperate with them under the NPG model (Moynihan & Thomas, 2013). With this new approach, activities of co-production, in which public professionals cooperate with citizens to achieve a common goal, entered the public domain.

By co-producing public services with their consumers, public professionals aimed to make public services more sustainable, while simultaneously attempting to increase the level of satisfaction among citizens (Bovaird, 2007; Boyle & Harris, 2009; Moynihan & Thomas, 2013). Examples of co-production can be found across numerous OECD countries, including the United Kingdom (Bovaird, 2007), the Netherlands (Van Eijk et al., 2017), Germany, France, Sweden (Pestoff, 2006), Denmark, Malaysia (Scriven, 2012), the United States of America (Etzioni, 1995), Brazil, and Mexico (Ackerman, 2004; Fung & Wright, 2001). Co-production practices do not only appear in the domain of security, but also in domains as health, recycling, and education (Brandsen & Honingh, 2016; Scriven, 2012). To gain more understanding of what co-production exactly entails, the intended benefits and challenges of co-production will be discussed next.

2.2 Benefits and Challenges of Co-Producing Public Services

Over the past two decades, the concept of co-production gained traction within the academic literature (Brandsen & Honingh, 2016; Voorberg et al., 2014). However, no consensus has been reached about what it specifically means and whether the use of co-production activities is desirable in the public domain (Brandsen & Honingh, 2016; Irvin & Stansbury, 2004). A possible explanation for this shortcoming is that the objective of co-production is not always clear, which

makes it difficult to assess its desirability. A systematic literature review by Voorberg and colleagues (2014) shows that the majority of the academic literature on co-production does not mention any objective. According to these scholars, “there seems to be an implicit assumption that involvement of citizens is a virtue in itself, like democracy” (Voorberg et al., 2014, p. 1341).

While co-production could indeed be an end in itself, it is often also used as a means to an end. According to numerous scholars, a common objective of co-production is to raise the perceived legitimacy of governmental actions by involving citizens in a direct manner (Loeffler & Bovaird, 2016; Meijer, 2014; Vanleene, Verschuere & Voets, 2015; Verschuere et al., 2012). By involving citizens during the various stages of public service delivery, citizens get the opportunity to directly represent themselves (Bovaird, 2007; Loeffler & Bovaird, 2016; Vanleene et al., 2015). As explained by Bovaird (2007, p. 846), “[this] has major implications for democratic practices beyond representative government because it locates users and communities more centrally in the decision-making process”.

Although direct citizen representation could increase the legitimacy of the decisions being made, using co-production as a tool to raise legitimacy also comes with risks. For instance, citizens could get involved solely to serve their own interest, which means that those citizens do not necessarily represent their community (Irvin & Stansbury, 2004; Jakobsen & Andersen, 2013; Neshkova & Guo, 2012; Vanleene et al., 2015). According to Brandsen and Honingh (2013), co-producing could therefore lead to a loss of legitimacy when citizens only voice their personal opinions or own experiences. The fact that some citizens could get overrepresented in co-production initiatives while others are being underrepresented could negatively affect the legitimacy of governmental actions, because legitimacy is generally based on indirect democratic representation of society (Irvin & Stansbury, 2004; Jakobsen & Andersen, 2013; Vanleene et al., 2015). This consideration needs to be taken into account when using co-production as a means to raise legitimacy for governmental actions.

Besides the objective of legitimacy, co-production activities hold the potential to produce public services more effectively (Boyle & Harris, 2009; Irvin & Stansbury, 2004). For instance, when government officials fail to come to an agreement in the stage of decision making, involving citizens could be of help to still achieve an outcome (Irvin & Stansbury, 2004). As such, co-production could contribute to the effectiveness of the decision making process. According to Irvin and Stansbury (2004), co-production could also result in more cost-efficient policy implementations when the input of citizens leads to ‘smarter’ solutions. This also means that public professionals could learn from citizens when they come up with novel solutions. Besides such solutions, citizens

could also provide “extra resources, in the form of help, support and effort” that are supplementary to the government’s own capacity (Boyle & Harris, 2009, p. 19). Given that citizens normally do not receive a financial compensation for their contributions, co-production makes the government’s activities more cost-efficient.

Alongside effectivity and efficiency, there are also other benefits to co-production. For instance, while citizens could learn from government representatives when trying to enlighten or persuade them, government officials could build trust among citizens or build strategic alliances (Irvin & Stansbury, 2004). Additionally, co-production activities could add value to society when these activities result in more support for social interaction or even lead to more social cohesion among citizens by letting these citizens cooperate with each other as opposed to only public professionals (Bovaird & Loeffler, 2012; Brandsen & Honingh, 2016).

While these outcomes are beneficial for society, the constant involvement of citizens is also a time consuming process for both civil servants and citizens (Irvin & Stansbury, 2004; Meijer, 2014; Vanleene et al., 2015). As stated by Bovaird (2007, p. 846), “it demands that politicians and professionals find new ways to interface with service users and their communities”. This may prove difficult, as public professionals are not used to cooperating with citizens as part of their jobs. By co-producing public services, either service planning or service delivery could be done in collaboration with citizens or communities (Bovaird, 2007). As suggested by Joshi and Moore (2004, p. 40), “[w]here co-production occurs, power, authority and control of resources are likely to be divided (not necessarily equally), between the state and groups of citizens”. Thus, co-production activities lead to a loss of control on the part of the government, as citizens gain some control over the process of public service delivery. While this does not need to be a problem, public professionals need to be prepared for dealing with this loss of control.

The challenge of losing control over either service planning or service delivery is linked to an often mentioned risk of co-production, being the lack of citizen’s impact (Irvin & Stansbury, 2004; Smith & McDonough, 2001; Vanleene et al., 2015). When public professionals misrepresent the influence of citizens’ contributions, resentment among these citizens could increase over time (Irvin & Stansbury, 2004). It could not only decrease citizen’s motivation to engage in co-production, a lack of impact could even result in a backlash when it increases the dissatisfaction of these citizens (Irvin & Stansbury, 2004; Smith & McDonough, 2001; Vanleene et al., 2015). After all, “it is shortsighted to ask a community for their creative contribution but neglect their feedback when taking decisions” (Gebauer, Füller & Pezzeri, 2013, p. 1524). As such, governmental entities need to be willing to listen and able to implement citizen’s input, before engaging these citizens into

the process of public service delivery. Once these challenges are overcome, co-production can prove to be an effective tool in making public services more sustainable, explaining why co-production activities are present in various domains and countries. Table 1 provides an overview of the most common benefits and challenges of co-producing public services cited in the literature.

Table 1. An Overview of Benefits and Challenges of Co-Producing Public Services

Level	Benefits	Challenges
Citizens	direct representation; achieving outcomes; cost-efficient public services; social cohesion among citizens; educative elements	time consuming process; lack of impact when input is ignored by public professionals, potentially resulting in a backlash
Governmental entity	legitimacy through direct representation; reaching decisions more effectively; increasing efficiency by using citizens as a resource; social cohesion in a neighbourhood	risk of overrepresentation of those citizens getting involved; time consuming process; chance of backlash when citizens' input is ignored; loss of control

2.3 Co-Production in the Domain of Neighbourhood Security

In the domain of neighbourhood security, co-production is a widely used method. Not only because citizens could hold crucial information that is necessary for solving criminal cases, but also because citizens are often willing to contribute to security in their neighbourhood. This subchapter discusses how co-production and neighbourhood security are defined, why citizens are willing to co-produce, and what common forms of co-production can be distinguished. These theoretical notions will help to hypothesise how co-production is expected to affect the level of both objective and subjective security.

2.3.1 Defining the Concepts Co-Production and Neighbourhood Security

In their article on co-production, Van Eijk and colleagues (2017, p. 323) state that “the key feature [of co-production] is that both citizens and professional agents contribute to the provision of public services, and that their collaboration is aimed at enhancing the quality of the services produced”. As in each domain, the collaboration between citizens and police officers is based on mutual dependency (Bovaird, 2007; Van Eijk, 2018). Despite citizens' efforts to make the neighbourhood

more secure, they will remain dependent on police officers when crime takes place, because “[they will] need back-up by the police in case a situation turns out violent” (Van Eijk, 2018, p. 223). Crucial here is that only police officers have the right to arrest people. Similarly, when citizens hold crucial information on criminal activities, police officers are dependent upon their contributions to solve these cases. As such, in the domain of local security, citizens and police officers are interdependent.

Considering these features of co-production, this study defines co-production in the domain of neighbourhood security as those activities in which citizens voluntarily collaborate with police officials to foster neighbourhood security, while also being dependent upon each other to achieve this. Differentiation between forms of collaboration based on their objective (e.g., to prevent, detect, or solve crime) is unfeasible, because forms of collaboration generally serve multiple goals. For instance, neighbourhood watch schemes could detect criminal activities, but their presence also contributes to the prevention and solving of crime. Therefore, co-production is conceptualised as the presence of activities in which citizens and police officers voluntarily collaborate with each other to foster local security.

With regard to security, the academic literature has commonly defined this concept as “a low probability of damage to acquired values” (Baldwin, 1997, p. 14). A further distinction is often made between two dimensions, being objective and subjective security (Wolfers, 1952; Zedner, 2003). Objective security refers to the actual level of threat within a certain area (Wolfers, 1952; Zedner, 2003). In police files, the level of objective security is often measured through crime rates, such as the number of burglaries, thefts, and violent acts (BZK & Ministry of Justice, 2003; CBS, 2018). Subjective security, on the other hand, is the citizens’ perception of security and their freedom from anxiety (Baldwin, 1997; Gabriel & Greve, 2003; Garofalo, 1979; Zedner, 2003). It is generally measured by asking citizens whether they feel unsafe or fear to become a victim of crime (CBS, 2018). The distinction between objective and subjective security is relevant, because higher levels of objective security do not necessarily lead to higher levels of subjective security and vice versa (Hale, 1996; Zedner, 2003). In the case of co-production, citizens could objectively become more secure due to the presence of local co-production activities, but still not feel secure and vice versa (Van der Land, Van Stokkom & Boutellier, 2014). Therefore, this study conceptualises neighbourhood security as a combination of both objective and subjective security of citizens.¹

¹ In the literature on co-production, scholars often use the concept ‘safety’. Note, while the concept ‘safety’ is solely concerned with unintended risks, the concept ‘security’ is typically used to address malicious risks (Piètre-Cambacédès & Chaudet, 2010). Given that crimes can be classified as malicious risks, this study uses the concept of security.

2.3.3 Motivations for Citizens to Co-Produce Neighbourhood Security

According to multiple scholars (Alford, 2002, 2009; Cepiku & Giordano, 2014; Van Eijk et al., 2017; Van Eijk, 2018; Verschuere et al., 2012), there are a variety of incentives for citizens to co-produce. In the context of security in the Netherlands, Van Eijk et al.'s research (2017) shows that citizen's willingness to co-produce could range from task-related factors (e.g. educational elements, achieving certain outcomes) to using co-production as a way to acquire personal benefits (e.g. direct representation, cost-efficient services) or communal rewards (e.g. social cohesion, local security). As such, citizens could be motivated to co-produce either by self-interest or the community's interest. In both cases, citizens are only willing to get involved in co-production activities once the (personal or communal) benefits of co-production outweigh its costs (Alford, 2009; Verschuere et al., 2012). In the context of local security, this means that citizens are willing to cooperate with the local police once the benefits are worth the time and effort (Van Eijk et al., 2017; Verschuere et al., 2012).

2.3.4 Common Forms of Co-Production in the Domain of Neighbourhood Security

In addition to the distinction between serving the self-interest of citizens or the communal interest of a neighbourhood, co-production activities could also be classified based on whether citizens participate in the existent infrastructure of the police, or invest own resources to create additional infrastructure. For example, citizens could file a complaint at the local police station, which means that they actively engage with the existing guidelines created by the police to facilitate cooperation. Contrary, citizens could also setup neighbourhood watch schemes in addition to routine police patrolling, creating additional infrastructure that complements the police's own infrastructure. Cross tabulating this distinction between participating in existent infrastructure or creating additional infrastructure with motivation results in Table 2. This table contains four distinct forms of co-production, that will be discussed in the remainder of this section. Note, while these forms are distinct from each other, different forms of co-production can occur simultaneously or sequentially.

Table 2. Forms of Co-Production in the Domain of Neighbourhood Security

	Participating in Existent Infrastructure	Creating Additional Infrastructure
Self-interest	Filing a criminal complaint at the local police office or via the internet	Installing cameras or alarm services at one's own property
Communal interest	Talking to the police about what is happening in the neighbourhood	Participating in neighbourhood watch schemes or mobile patrols

A co-production activity in which citizens actively participate in the existent infrastructure of the police while acting in their own interest is filing a criminal complaint at the local police station or via the internet. For instance, when citizens report a burglary, they actively participate in existent infrastructure to solve this specific case. In these situations, citizens generally act in their own interest, given that they want this specific crime case which concerns them to be solved.

A co-production activity in which citizens again actively participate in the existent infrastructure of the police but act in the interest of the neighbourhood is talking to the police about what is going on in the neighbourhood. Rather than talking about situations that affected them personally, citizens also speak of what is generally happening in the neighbourhood. Citizens could then speak of situations in which they were not involved themselves. For instance, citizens could share information with the local police on a burglary that took place at a neighbour's house. As such, citizens contribute to security within the neighbourhood, acting in the communal interest.

Besides these participative forms of co-production, citizens could also co-produce local security by creating additional infrastructure. A co-production activity in which citizens do so and act in their own interest is installing cameras or alarm services at their own property. Installing cameras is a form of co-production, because gathering camera footage provides citizens and police officers with the opportunity to collectively act upon criminal activities. When a criminal act is caught on camera, the police could go to the owner and request the footage that might help to solve the criminal case. Similarly, when alarm services are installed and go off when crime takes place, police officers are called in to arrest the offenders. These activities are forms of co-production, because citizens and police officers cooperate with each other while being dependent upon each others contribution. Installing cameras or alarm services is primarily in the interest of those owning the property, especially because such services could deter thieves and encourage them to go to another house in the neighbourhood where the chance of being caught is smaller.

A co-production activity in which citizens also create additional infrastructure but act in the interest of the neighbourhood is citizens creating and participating in neighbourhood watch schemes. Neighbourhood watch schemes (in Dutch: *Buurtpreventieapps*) are groups of citizens that keep an eye on the streets of their neighbourhood and communicate with each other via mobile phone apps, such as WhatsApp (Van Eijk et al., 2017). If anything suspicious happens on the streets, the citizens that are part of this app will warn each other and, if needed, contact the police (Van Eijk et al., 2017). As citizens voluntarily cooperate with police officers in order to increase local security, neighbourhood watch schemes can be seen as a form of co-production. More specifically, citizens create infrastructure that complements the patrolling routines of the police and

only contact the police when backup is needed when a situation turns out violent. Furthermore, the presence of neighbourhood watch schemes is in the collective interest, because all those living in the neighbourhood benefit from the deterrence effect that such schemes have.

2.4 Linking Co-Production and Neighbourhood Security

Although co-production is a widely used method in the domain of neighbourhood security and citizens are often willing to contribute, there is no clear consensus on whether co-production is an effective tool to increase security (Rosenbaum, 1987; Garofalo & McLeod, 1989; Meijer, 2011; Van der Land et al., 2014). While co-production could lead to more eyes on the street, hearing about local security issues could also decrease the level of subjective security (Rosenbaum, 1987; Zedner, 2000). Moreover, an overload of co-production initiatives could create resistance among citizens to cooperate and decrease the level of trust in the police (Van der Land et al., 2014). Given these risks, a closer look is given at the links between co-production and security.

2.4.1 The Effect of Co-Production on Objective Security

Co-production activities that aim to increase neighbourhood security are expected to have a deterrence effect on criminality, because the presence of such activities increases “the perceived risk [for offenders] of being detected, captured and possibly arrested” (Stutzer & Zehnder, 2013, p. 3). Given this increased perceived risk of being caught, potential criminals are less likely to commit crimes. As such, the presence of co-production activities is expected to positively affect the objective security of a neighbourhood.

This deterrence mechanism is based on Foucault’s (1989) theory of the surveillance society, which states that potential criminals have the discipline to not commit a crime when they believe to be watched and are potentially punished for breaking the law. Following this logic, the presence of cameras, alarm services or neighbourhood watch schemes could reduce the number of criminals committing crimes, even if these co-production activities do not actually increase the chances of being caught. An increase of the *perceived* risk for offenders is in itself enough to create a deterrence effect and to lower the crime rates in a neighbourhood (Foucault, 1989; Stutzer & Zehnder, 2013). This deterrence mechanism is enhanced by three sub-mechanisms, that will be discussed consecutively.

According to several scholars, co-production holds the potential to increase neighbourhood security as citizens bring in additional resources (Bovaird, 2007; Boyle & Harris, 2009; Irvin & Stansbury, 2004; Vanleene et al., 2015). For instance, when citizens participate in neighbourhood

watch schemes, there are more eyes on the street that could help to detect criminal activities. Also private security cameras could provide footage that is not caught by the public surveillance system. Not only do neighbourhood watch schemes and installed cameras help police officers to detect or retrace criminal activity (Stutzer & Zehnder, 2013), it also enhances the deterrence effect as the chances of being caught increase.

Alongside an increase in resources, co-production activities in the security domain could also change the behaviour of both citizens and police officers. As explained by Van der Land et al. (2014), co-production activities could change citizen's behaviour as they potentially dare to report more, could show more self-reliant behaviour and might become more committed to fight crime within their own neighbourhood. Regardless of whether citizens are in these cases self-interested or community-focused, such behaviour could enhance the deterrence effect as it increases the risk for offenders of being caught.

The behaviour of police officers could also change when co-production activities motivate them in their work. For instance, when police officers get to know citizens better through cooperation, they could get intrinsically motivated to protect these citizens and put in additional efforts to fight crime in the neighbourhood. This form of motivation is also known as public service motivation, which means that civil servants are generally motivated to contribute to the public interest (Perry, 1996; Rainey, 2014).

Police officers could also get extrinsically motivated given that co-production activities change the principal-agency relationship. Traditionally, police officers (the agents) were solely controlled by their supervisors (the principals). As this control is only limited and principals cannot control all decisions the agents make, police officers enjoy some discretionary freedom (Jensen & Meckling, 1976; Handel, 2003). This freedom could, without any other form of control, be used by police officers to act in their own interest (Jensen & Meckling, 1976; Handel, 2003). By introducing co-producing activities, police officers are no longer solely controlled by their supervisor, but also by citizens. Due to this extra actor that monitors their work, police officer could get extrinsically motivated to act in the interest of citizens by increasing security.

These two forms of motivation that potentially result from co-production activities could lead to more objective security by enhancing the deterrence effect. Based on these mechanisms, this study expects that co-production activities decrease crime rates in neighbourhoods. The first hypothesis therefore reads:

H1: co-production activities positively affect the objective security of citizens in the Netherlands.

2.4.2 The Effect of Co-Production on Subjective Security

According to several scholars, co-production could increase the sense of security among citizens by having them experience some form of (social) control over the neighbourhood (Carr, 2005; Stutzer & Zehnder, 2013; Van der Land et al., 2014; Van Eijk et al., 2017). This form of control could be derived from the installation of security cameras or alarm services, but also from participating in neighbourhood watch schemes (Stutzer & Zehnder, 2013; Van Eijk et al., 2017). By experiencing some form of (social) control over their neighbourhood, citizens believe to be contributing to or even controlling the security in their neighbourhood (Carr, 2005). Due to this control, the fear of becoming a victim of crime reduces and their perceived level of security increases (Van der Land et al., 2014). Even though the perceived security of citizens could initially decrease when they become aware of the crime in their area (Zedner, 2000), co-production activities are expected to counter this loss as citizens experience some form of control over this crime (Van der Land et al., 2014).

Furthermore, co-production activities could also indirectly raise subjective security through increasing social cohesion within a neighbourhood (Bovaird & Loeffler, 2012). This presumed mechanism is based upon one of the expected benefits of co-production, being that co-production activities could strengthen social cohesion within a neighbourhood (Brandsen & Honingh, 2016). According to Boers, Steden and Boutellier (2008), citizens who feel like they belong to their neighbourhood feel more secure living in that neighbourhood. Research by Oppelaar and Wittebrood (2006) also shows that social cohesion positively affects the subjective security of citizens in the Netherlands. Thus, via increased social cohesion, the sense of feeling secure could increase. Based on these studies, co-production activities are expected to indirectly increase the perceived level of security through social cohesion. Note, this mechanism only applies when citizens not only cooperate with the police, but also with each other.

A factor that could influence both co-production activities and the subjective security of citizens is the amount of trust these citizens have in the police. According to Scheider, Chapman and Schapiro (2009, p. 700), “[c]itizens who do not trust the police are less likely to report crime”. Once citizens participate in co-production activities, their trust in government could also change as they learn what the local police does to foster security within their neighbourhood (Van der Land et al., 2014). Research shows that citizens feel more secure when they trust the police (Scheider et al., 2009). Based on these varying mechanisms, co-production activities are expected to enhance the level of subjective security. Therefore, the second hypothesis reads:

H2: co-production activities positively affect the subjective security of citizens in the Netherlands.

3. Research Design

This chapter explains the research design of this study. In the first part, the research approach will be outlined by justifying the choice for a large-N design in combination with a strategy of conditioning. The conceptual model then presents how the co-production is expected to affect the level of security. In the second part, the variables that are part of this model will be operationalised.

3.1 Research Approach

This research investigates how the independent variable *co-production activities* affects the dependent variables the *objective security* of Dutch neighbourhoods on the one hand, and the *subjective security* of the citizens living in these neighbourhoods on the other hand. In this study, co-production activities are captured by the four forms of co-production discussed earlier, being: (1) having contact with the local police, (2) filing a criminal complaint, (3) the presence of neighbourhood watch schemes, and (4) installing cameras and alarm services. Based on the academic literature regarding co-production, this study expects that these co-production activities will positively affect both objective and subjective security. The deductive logic of this study enables the researcher to test these two hypotheses in practice (Bryman, 2012; Toshkov, 2016).

To structurally measure what effect co-production activities have on objective and subjective security in the Netherlands, this study conducts a large-N study in which all Dutch neighbourhoods are represented. The large-N design is chosen over a comparative case study, because the large-N design enables the researcher to “identify and estimate weak and heterogeneous causal relationships” by using quantitative data coming from a large number of cases (Toshkov, 2016, p. 200). Moreover, in order to answer the research question, the sample needs to represent the research population (Bryman, 2012). As the population of this study contains all Dutch neighbourhoods, analysing each of these neighbourhoods is preferred over generalising the results of only a few.

Figure 1 provides a graphical overview of the expected relationships between all variables. All observable variables are presented as rectangles, whereas the ellipse ‘co-production activities’ indicates a latent variable that is constructed from the four observable variables in the rectangles on the left side.² The deterrence effect co-production has on objective security and the control effect it has on subjective security are not visible in the conceptual model, as these effects form the direct relationship between co-production and objective and subjective security respectively. Therefore, the conceptual model must not control for these two effects (Toshkov, 2016).

² For more information on the graphical display of latent variables in conceptual models, see Kline (2011) on page 95.

To increase causal inference, the large-N design will be combined with a strategy of conditioning. This means that confounding, mediating and covarying variables are included into the conceptual model to adjust for their effects (Toshkov, 2016). This strategy also contributes to the internal validity, because it minimises a systematic error in the effect sizes: when part of the effect is explained by one of the control variables, this part will not be attributed to the effect the dependent variable has on the independent variables (Toshkov, 2016). In this study, trust in the police is a confounding variable, as it could both motivate citizens to co-produce while also influencing their sense of security (Van Eijk et al., 2017). As explained earlier, trust is also a mediating variable, given that co-production activities could make citizens feel more secure through increased trust in the police. Another important mediating variables is social cohesion, because this factor could explain how co-production activities affect citizens' sense of feeling secure.

Finally, some covariates have to be included into the model. Social incivilities (e.g. youth, drunk people or drug use on the streets) are expected to covariate with subjective security, as “the presence of incivilities has been linked to [...] greater feelings of insecurity” (Mason, Kearns & Livingston, 2013, p. 23). Both the degree of urbanisation of a neighbourhood and income are expected to influence the objective security of citizens, as urbanised and disadvantaged neighbourhoods are generally faced with higher crime rates (Eurostat, 2015; Maas-de Waal, 2002; Van Wilsem, Wittebrood & De Graaf, 2006). Alongside these effects, objective and subjective security are expected to interact, because whether a citizen *feels* secure could be dependent upon whether that citizen *is* secure and vice versa (Maas-de Waal, 2002; Wolfers, 1952).

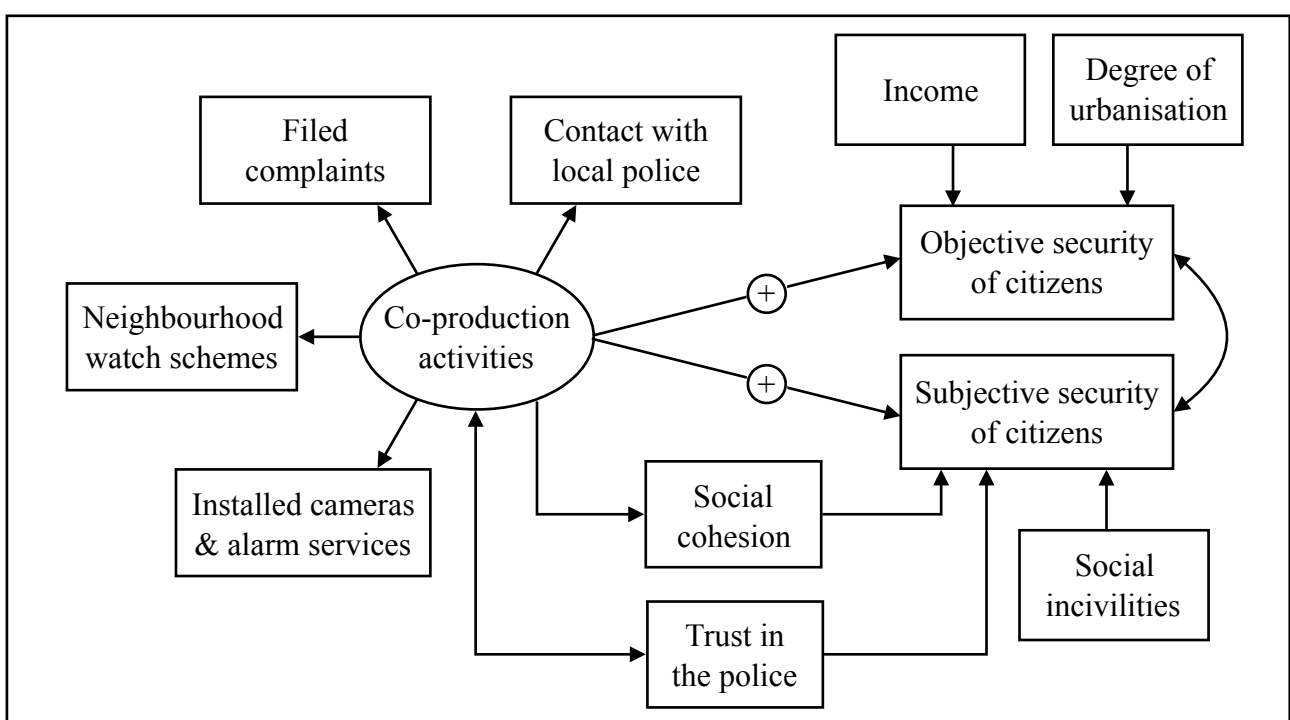


Figure 1. The Conceptual Model: Linking Co-production Activities and Security

3.2 Operationalisation of Key Variables

In this subchapter, all of the variables that are part of the conceptual model will be operationalised in order to translate the systematised concepts into indicators that can be measured in practice. As will be explained in Chapter 4, this study uses data from the Dutch Central Agency for Statistics (CBS) on the level of local police units. Therefore, the majority of the key variables of this study is operationalised in accordance with the operationalisations of CBS. The variable ‘neighbourhood watch schemes’, that is based on data from the website *WhatsApp Buurt Preventie* (WABP), will be operationalised independently.

3.2.1 Operationalisation of the Independent Variable: Co-production Activities

The presence of co-production activities in a certain neighbourhood is a latent variable, which means that this variable cannot be observed in a direct manner, but rather has to be inferred from other, measurable variables. As indicated in the conceptual model (see Figure 1), the variable ‘co-production activities’ will be inferred from four observable variables, being: (1) contact with the local police, (2) filing a criminal complaint, (3) neighbourhood watch schemes, and (4) installing cameras and alarm services. Together, these variables represent the wide range of co-production activities, as each of the four forms of co-production in the security domain are incorporated into the model. Before data on these variables can be collected, each of these forms of co-production will need to be operationalised.

The variable ‘neighbourhood watch schemes’ is operationalised as the number of watch schemes within a local police unit. To correct for the size of each unit in terms of citizens, the number of watch schemes is counted per 10.000 citizens. The variable ‘installed cameras and alarm services’ is operationalised as the percentage of citizens that reports to have cameras or alarm services installed at their own property.³

With regard to the two participative forms of collaboration, the variable ‘contact with the local police’ is operationalised as the percentage of citizens that has been in contact with their local police over the past twelve months. This percentage excludes any form of contact regarding law enforcement (e.g. fines, warnings), because having contact about law enforcement does not classify as co-production. The variable ‘filing a complaint’ is operationalised as the percentage of citizens that has filed a criminal complaint at the police in the past twelve months. Both variables are presented as percentages (instead of absolute numbers) to correct for the size of the police unit.

³ While there are also other home security measures that citizens could take in order to prevent crime, such as installing security locks or placing shutters in front of doors and windows, these measures do not classify as co-production.

3.2.2 Operationalisation of the Dependents Variables: Objective and Subjective Security

Following the conceptual distinction that has been made between objective and subjective security, these dimensions of security are operationalised separately. ‘Objective security’ is operationalised as the number of (attempted) crimes per hundred citizens within a certain neighbourhood. This number includes (attempts to) violent crimes, property crimes, and vandalism offences. It excludes cyber crime, because this type of crime is not bound to the neighbourhood in which the citizen lives as it happens in the online world and could therefore be committed at any location. ‘Subjective security’ is operationalised as the percentage of citizens that indicates to regularly feel insecure living in their neighbourhood. In this case, percentages are used again to correct for the size of the neighbourhood.

3.2.3 Operationalisation of the Mediating and Covarying Variables

The mediating variable ‘trust in the police’ is operationalised as the extent to which citizens believe that police officers will help them out when needed. This is measured by asking citizens to respond to two statements, being: (1) the police is there for you if you need them, and (2) the police will do their utmost best to help you out when needed. Based on these two questions, a total score can be calculated that indicates the level of trust in the police, ranging from 0 (no trust at all) to 10 (fully trust the police). Appendix 1 explains how these scores are calculated.

The mediating variable ‘social cohesion’ is measured by asking citizens to respond to four statements about the level of social cohesion in their neighbourhood. These statements are concerned with (1) whether the citizens living in their neighbourhood know each other, (2) whether the interactions citizens have with each other are pleasant, (3) whether citizens help each other out, and (4) whether citizens feel at home in their neighbourhood. Based on these statements, a total score between 0 and 10 can be calculated that indicates the level of social cohesion in a neighbourhood. Appendix 1 explains how these scores are calculated.

The first control variable ‘social incivilities’ is operationalised as the percentage of citizens that sometimes is being disturbed by one or more forms of social incivilities in their neighbourhood. These forms include drunk people on the streets, drug use or drug trafficking, nuisance by local residents, people being harassed on the street, and youth hanging around. The second control variable ‘degree of urbanisation’ is calculated by dividing the number of citizens living in the area of the local police unit by the size of that same area. The third control variable ‘income’ is operationalised as the average income per citizen living in the area of a local police unit.

4. Research Methods

This chapter will explain how empirical data is collected, processed and analysed in order to provide a reliable and valid answer to the research question. First, this chapter discusses what data is used and how this data was collected. By doing so, it defines the unit of analysis and the unit of observation. In the second part, it outlines how data will be analysed and how the hypotheses will be tested. The chapter concludes with a discussion on the study limitations.

4.1 Data Collection

As announced in the previous chapter, this study uses quantitative data from the Central Agency for Statistics (CBS) of the Netherlands for most variables in the conceptual model. With the so-called Security Monitor questionnaire, CBS annually collects numerical data on the development of (in)security in the Netherlands (CBS, 2018). The data of the Security Monitor 2017 will be used for this research, as this is the most recently available data. This data is preferred over collecting new data or using other sources, because the Security Monitor includes questions on both co-production practices and the two dimensions of security. Moreover, CBS has access to a high number of respondents as it has the ability to send out questionnaires by mail to a representative sample of Dutch citizens that live across the country (CBS, 2018). As these data characteristics suit the research goal, data from the Security Monitor is used to find out how co-production affects security.

The questionnaire of the Security Monitor is divided into several sections, ranging from prevention to victimhood. An overview of the questions that were used from the questionnaire can be found in Appendix 2. Based on the questions in these sections, CBS created six datasets, being: (1) Prevention, (2) Citizens & the Police, (3) Experienced Crime, (4) Perceptions of (In)Security, (5) Liveability of the Neighbourhood, and (6) Crime Victimhood (CBS, 2018). Although CBS collects information at the *individual* level, making the unit of observation the individual, data is only publicly available on *aggregated* levels, such as the regional units, the provinces or the municipalities. This study analyses all data on the level of local police units (in Dutch: *basisteams*), which is the lowest level on which data is reliable and made publicly available (CBS, 2018). This level is preferred over higher levels (e.g. districts, regions), because the police officers of the local units are responsible for the core tasks of the police, which includes strengthening the involvement of citizens in tackling security issues (Terpstra, Van Duijneveldt, Eikenaar, Havinga & Van Stokkom, 2016). Therefore, the local police units will be used as the unit of analysis.⁴ To facilitate

⁴ For more information on how the Dutch police network is structured, see Appendix 3.

the analysis, this study will use five datasets from the Security Monitor. As these datasets are derived from the same questionnaire (CBS, 2018), they can be merged into one dataset.

Starting with the data collection on the four forms of co-production, data on the indicator ‘installed cameras and alarm services’ is derived from the dataset Prevention. While this study operationalised this variable as the percentage of citizens that has installed cameras or alarm services, there is only data available about the percentage of citizens that has installed alarm services. Therefore, this study will solely use data on the presence of alarm services, leaving aside the presence of cameras. With regard to the indicator ‘contact with local police’, the dataset Citizens & the Police is consulted to include data on the percentage of citizens that has had contact with their local police over the past twelve months. Data on the indicator ‘filed complaints’, operationalised as the percentage of encountered crimes that were reported to the police, is derived from the dataset Experienced Crime.

As information on the indicator ‘neighbourhood watch schemes’ is not part of CBS’ Security Monitor, data on the percentage of citizens participating in neighbourhood watch schemes is requested from the website of *WhatsApp Buurt Preventie* (WABP). On this website, administrators of WhatsApp groups that aim to prevent crime in a certain area can register their watch scheme. WABP has data on how many watch schemes were present in each municipality in 2017, and how many citizens were living in these municipalities at that time.⁵ Based on this data, the number of watch schemes per 10.000 citizens can be calculated. As this data is only available on the level of the municipality, this data will be converted to the level of local police units. This conversion will be based on the local police unit structure that has been in place since 2013 (see Appendix 3).

With regards to the dependent variable ‘subjective security’, data on the percentage of citizens that regularly feels insecure in their neighbourhood is derived from the dataset Perceptions of (In)Security. To cover the dependent variable ‘objective security’, the dataset Experienced Crime is used to include data on the total number of (attempted) crimes per hundred citizens. Data on the two mediating variables, being ‘social cohesion’ and ‘trust in the police’, are derived from the datasets Liveability in the Neighbourhood and Citizens & the Police respectively. To include data on the control variable ‘social incivilities’, the dataset Liveability of the Neighbourhood is again used because this dataset contains data on the percentage of citizens that regularly experience one or more forms of social incivilities.

⁵ As the Security Monitor 2017 was held in the period August-November 2017, data from August 2017 will be used to calculate how many neighbourhood watch schemes were present per 10.000 citizens in each local police unit. This will keep the time of measurement of this variable as equal as possible to those measured in the Security Monitor.

Despite the comprehensive approach of the Security Monitor, the questionnaire does not include questions on ‘degree of urbanisation’ or ‘income’. Data on these variables therefore needs to be derived from other sources. To include data on both of these control variables, this study uses data from CBS’ dataset called Key Figures on Areas and Neighbourhoods 2017. As is the case with the data on neighbourhood watch schemes, data on the income of citizens in a neighbourhood and the degree of urbanisation is only available on the level of the municipality (CBS, 2019a). Therefore, the data on both these control variables will be converted from the level of the municipality to the level of local police units before it can be included into the analyses. Given that the dataset includes data on the number of inhabitants, the income per inhabitant, and the size of the area for each municipality (CBS, 2019a), the income and the level of urbanisation can be calculated on the level of the local police unit.

4.2 Data Analysis

Once data on all key variables is collected, the data can be statistically analysed. This subchapter outlines how the data will be analysed by explaining what statistical techniques will be used, how their underlying assumptions can be checked and how these techniques will help in answering the research question. At the end, the study limitations will be discussed.

4.2.1 Structural Equation Modelling (SEM)

Once this study has used descriptive statistics to check for data particularities, it will use the method of structural equation modelling (SEM) to analyse the quantitative, continuous data and to test the two hypotheses stemming from the theoretical framework. SEM is a series of statistical techniques that can test a set of relationships between one or more independent and dependent variables at the same time (Tabachnick & Fidell, 2012). By using SEM, one can create a model in which linear combinations of a latent, independent variable predict linear combinations of observed dependent variables (Tabachnick & Fidell, 2012). Thus, rather than testing multiple relationships by conducting multiple regression analyses, SEM looks at the whole model at once and indicates to what extent the model fits the data at hand (Kline, 2011).

Given that co-production is a latent variable, this study will conduct a structural regression model (SR model), which is one of the core SEM techniques, by using the Lavaan package in the statistical programme *R* (Kline, 2011). An SR model not only “allows tests of hypotheses about direct and indirect causal effects”, but can also incorporate “a measurement component that represents observed variables as indicators of underlying factors” (Kline, 2011, p. 118). Given these

two features, using structural regression models is preferred over path models or any other form of regression analysis.

4.2.2.1 Data screening

Before any inferential statistics can be run, this study first generates some descriptive statistics to check for any data particularities, such as suspicious outliers, unusual standard deviations or deviating numbers of observations. The descriptive statistics are also used to check whether the data fits the assumptions that the maximum likelihood (ML) estimator in SEM makes when analysing the data. Although the ML estimator is the default method in SEM, other estimators need to be used when the data does not meet all the assumptions of the ML estimator.

As outlined by Kline (2011), the assumptions of the ML estimator are that the data (1) has no structural missing data, (2) contains no extreme outliers, (3) uses approximately the same relative variances, and (4) contains no predictor variables that extremely correlate with each other. Moreover, it assumes that the dependent variables are normally distributed. To check whether the first two assumptions hold, this study will run some descriptive statistics that show the number of observations, the mean, the standard deviation, the minimum score and the maximum score per variable. To check the relative variances, the scale and range of each variable will be assessed.

To see whether the data of the dependent variables is normally distributed, this study plots both ‘the number of (attempted) crimes per hundred citizens’ (objective security) and ‘the percentage of citizens that sometimes does not feel safe within their neighbourhood’ (subjective security). Alongside these plots, it also runs a Shapiro-Wilk normality test for each of the dependent variables to check whether the plots are rightly interpreted.

High multicollinearity, which indicates that two or more predictor variables might be measuring the same variance (Allison, 1999), is assessed by running a pairwise correlation analysis. In case this analysis shows that the collinearity between two or more predictor variables is $\geq .70$, variables are further investigated and might be excluded from the analysis or will only be used when the predictor variable with which it strongly correlates is not included.

4.2.2.2 Hypothesis testing

Whereas the traditional quantitative way of testing hypothesis consists of five steps, being (1) setting hypotheses based on a theoretical framework, (2) developing a conceptual model and identifying the predicted causal relationships, (3) defining the level of significance, (4) running the statistical tests, and (5) based on the output, accepting or rejecting the hypotheses (Bryman, 2012).

In this study, some additional steps are taken. Given that SEM tests a model as a whole, the output will indicate to what extent the model fits the empirical data by reporting the so-called fit statistics (Kline, 2011). When these fit statistics are below their cut-off point for a good fit, the model needs to be adjusted and rerun, before interpreting the regression output (Kline, 2011).

To find out what model can best explain how co-production affects the level of both objective and subjective security, this study will apply the strategy of model building. In this strategy, one starts with the most basic model (Kline, 2011). In this study, that model consists of the independent variable and the two outcome variables. In additional models, this basic model will be further optimised by adding paths and explanatory variables (Kline, 2011). What paths and variables need to be included or excluded will be based on both the theoretical propositions and the empirical results (Kline, 2011). Each time, the new model will be compared with the best model until then by interpreting the fit statistics of the models. Once all expected paths and variables have been included to see whether they improve the model, the regression output of the model with the best fit statistics will be used to test the hypotheses.

4.2.3 Reliability and Validity

When assessing the limitations of this study, both reliability and varying types of validity need to be considered. Reliability refers to the consistency of measuring concepts with repeated measurements (Bryman, 2012). The reliability of most variables in this study is dependent upon CBS' method of data collection. CBS gathered information by sending a sample of Dutch citizens a self-completion questionnaire (CBS, 2018). In the Security Monitor report, CBS states that "the large number of respondents makes it possible to make reliable statements at a detailed level about the objective and subjective security in the Netherlands" (CBS, 2018, p. 3). Given the consistency in data collection and the representative sample, repeated measurements on the same concepts are expected to lead to similar results. With regards to the data on the neighbourhood watch schemes, a limiting factor is that not all watch schemes being present in the Netherlands are registered at the website of WABP. This means that, in reality, more watch schemes could have been present in 2017 than those being registered at the website of WABP. However, as this is true for the whole country, this limiting factor is not expected to obstruct the inferential statistics.

To ensure validity, which indicates the extent to which what you measure reflects what you want to measure (Bryman, 2012), several precautions have been taken. To increase content validity, which concerns "the extent to which the measure covers all aspects of a concept" (Toshkov, 2016, p. 119), the variable co-production activities has been composed of a variety of activities that are all

forms of co-production and together represent the full range of activities. However, it remains difficult to gather quantified data on *all* possible forms of co-production. For instance, citizens could unintentionally cooperate with the police when sharing a warning for potential offenders on their social media or they could create additional infrastructure by installing cameras at their own property. While these activities could be seen as co-production, there is no data available on such practices and both could therefore not be included as indicators of co-production. This forms a concern for content validity and will therefore be taken into account when assessing the results.

Another form of validity is internal validity, which indicates the degree to which causal conclusions can be drawn and alternative explanations can be excluded (Allison, 1999). Internal validity is warranted by the strategy of conditioning when modelling in SEM: both confounding and mediating variables will be added to the model to adjust for their effects (Toshkov, 2016). This ensures that causal effects are not unjustly attributed to direct relationships between co-production activities and security when these effects are actually the result of indirect relationships or covariants. However note, confounding and mediating variables could also be excluded from the models in case these variables do not significantly improve the fit statistics of the model. In these cases, a good model fit is preferred over the strategy of conditioning, because this study aims to figure out *how* co-production activities affect the level of security instead of *to what extent* this is the case. This means that, even if some effect sizes are unjustly attributed to other relationships, the conclusions will not be affected by it.

The external validity of this study, which examines the extent to which the study results are generalisable to other contexts (Allison, 1999; Toshkov, 2016), is however limited. Although the underlying mechanisms of the conceptual model are not exclusive to the Dutch context, this study is solely focussed on the Netherlands and the conclusions are based upon data from the Dutch context alone. As described in Chapter 1, the Netherlands is known for its decentralised police system (Peper & Korthals, 1998; Van Rijn, 2011; VNG, 2018). Other Western countries, such as France, have a police system that is more centralised than the Dutch police system (Dammer & Albanese, 2014). This means that the results of this study cannot directly be generalised towards other Western democratic countries, even if co-production is a common method within the security domain of these countries. To test whether the conclusions that result from this study are also applicable to other countries that use forms of co-production, future research could conduct a SR model with structured means. This technique makes it possible to compare multiple countries and see whether these countries are significantly distinct from each other or whether the same model applies to both of them (Kline, 2011).

5. Results of Data Analysis

This chapter reports on the statistical outputs of the data analyses as described in the previous chapter. The first part shows the results of the descriptive statistics, which are used to test the assumptions of the ML estimator in SEM. The second part reports on the process of structural regression modelling and shows the regression output of the model with the best fit statistics.

5.1 Results of Descriptive Statistics

Based on the results of the descriptive statistics, the assumptions on missing data, extreme outliers, and relative variances can be assessed and will be discussed first. Afterwards, additional statistical tests are run to check whether the dependent variables are normally distributed and whether the predictor variables do not extremely correlate.

5.1.1 Assumption 1: Missing Data

As shown in column two of Table 3, almost all of the variables have 167 observations. This number equals the number of local police units in the Netherlands, which means that no data is missing. In case of filed complaints, 37 observations are missing. According to CBS' report of the Security Monitor (2018), the low responses that led to this missing data are not structurally. Moreover, the missing data cannot be explained by other variables, such as city size or crime rates.

Table 3. Descriptive Statistics of All Variables on the Level of Local Police Units

Variable	Obs.	Mean (SD)	Median	Min.	Max.	Range
Contact local police	164	10.9 (2.3)	10.6	5.9	19.4	13.5
Filed complaints	130	34.4 (6.8)	35.3	14.0	48.7	34.7
Neigh. watch schemes	167	3.9 (3.3)	1.6	0.4	19.2	18.8
Home sec. measures	167	12.7 (4.6)	12.4	2.8	28.1	25.3
Objective security	167	29.1 (12.7)	25	10	77	67
Subjective security	167	17.5 (7.2)	15.7	6.8	42.4	35.6
Social cohesion	167	6.1 (0.5)	6.2	4.8	7.2	2.4
Trust in police	167	6.6 (0.2)	6.6	5.8	7.1	1.3
Social incivilities	167	57.0 (12.1)	53.5	40.3	95.9	55.6
Income	167	25.8 (3.0)	25.2	20.7	46.2	25.5
Urbanisation	167	22.4 (16.8)	17.1	3.6	60.0	56.5

Although the number of observations of the variables neighbourhood watch schemes, income and urbanisation seem complete, one must note that the data of these variables has been collected at the level of the municipality. As the data will be analysed at the level of the local police units, the data needed to be aggregated to this level of analysis. While most local police units consist of several municipalities, some large cities are split up in multiple police units. To still aggregate this data, this study uses the average score of the municipality these units are located in. Although both of these things are far from optimal, both do not violate the first assumption of the ML estimator, as no specific data is structurally missing.

5.1.2 Assumption 2: Extreme Outliers

To check for extreme outliers, the standard deviation scores, together with the minimum and maximum scores, need to be checked for each of the variables. When these scores, that are shown in Table 3, indicate that the data of a certain variable includes extreme outliers, the observations that have a z-score > 3.0 will be further investigated. In general, this study is reluctant to remove data derived from the datasets of the Security Monitor, because this data has already been checked by CBS on extreme outliers before it was aggregated to the level of the local police unit (CBS, 2018). This means that extreme outliers from these datasets will only be excluded from the sample when the extreme scores are not explicable and do not represent the corresponding unit or when the conceptual model is no longer applicable to this specific case. All variables will be discussed, apart from the three variables that contained no extreme outliers ($z > 3.0$), being ‘filed complaints’, ‘social cohesion’ and ‘degree of urbanisation’.

As shown in Table 3, the maximum score of the variable ‘objective security’ is relatively high. An overview of the z-scores shows that two parts of the Dutch capital, Amsterdam Centrum-Burgwallen ($z = 3.77$) and Amsterdam Zuid-de Pijp ($z = 3.14$), form outliers. These high levels of crime could also explain why Amsterdam Centrum-Burgwallen is an outlier on the indicator ‘contact with the local police’ ($z = 3.63$). As these units are known for the high level of crimes and the scores thus represent their units, the observations do not need to be excluded.

Similar to ‘objective security’, the range of the variable ‘social incivilities’ is high with a value of 55.60. The minimum score of 40.30 concerns the local police unit of IJsselland-Noord, which is a small village in the province of Overijssel, while the maximum score of 95.90 is measured in the area Amsterdam Centrum-Burgwallen. Although Amsterdam Centrum-Burgwallen is a positive outlier ($z = 3.21$), the score fits well with this unit and should therefore not be

excluded. Amsterdam Centrum-Burgwallen is known for its red light district and tourism, which could explain why the percentage of citizens that regularly experience social incivilities is high.

With regards to the variable ‘subjective security’, an overview of the z-scores shows that the local police units The Hague De Heemstraat ($z = 3.46$) and The Hague Hoefkade ($z = 3.40$) are extreme outliers. These units are both situated in the Schilderswijk of The Hague, which is a neighbourhood in which the degree of diversity in nationalities, beliefs, religions, and socio-economic backgrounds is high (CBS, 2019b). As this diversity could explain why people feel less secure in this neighbourhood, these observations do not need to be excluded from the sample.

The overview of the z-scores of the control variable ‘income’ shows us that, additional to Wassenaar ($z = 6.75$), GV-Noord ($z = 3.04$) and Kennemer Kust ($z = 4.30$) form outliers. Wassenaar is one of the richest towns in the Netherlands, which could also explain why it forms an outlier on the variable ‘installed cameras and alarm services’ with a z-score of 3.35. GV-Noord forms the northern part of the Gooi and Vechtstreek, which is one of the richest regions in the country. Kennemer Kust consists of the municipalities Bloemendaal, Heemstede, Zandvoort, which are also known as rich cities. As the population of this study also includes the richest areas of the Netherlands, Wassenaar, GV-Noord and Kennemer Kust will not be excluded from the sample.

Based on the z-scores of the variable ‘trust in the police’, the local police units Heuvelland ($z = -3.25$) and Westelijke Mijnstreek ($z = -3.25$) appear to be negative outliers. The citizen’s low level of trust in the local police in these areas could be explained by the severe drug trafficking problems these units have been facing over the past decades (CBS, 2017; Limburg, 2017). Given this explanation, the observations will not need to be excluded from the sample.

While all variables that have been discussed so far were measured by CBS, data on the variable ‘neighbourhood watch schemes’ is collected by WABP and contains the percentage of citizens participating in a neighbourhood watch scheme. An overview of the z-scores shows that the local police units GV-Zuid ($z = 4.61$), Haarlemmermeer ($z = 3.91$), Tweestromenland ($z = 3.61$), Brunssum/Landgraaf ($z = 3.28$) and Lelystad/Zeewolde ($z = 3.12$) form outliers. As neighbourhood watch schemes were in 2017 still quite new in the Netherlands and the website of WABP was only launched in 2015, it is no surprise that the number of watch schemes per 10.000 citizens still varied a lot between different areas. Therefore, these outliers will not be excluded.

5.1.3 Assumption 3: Relative Variances

The default fit statistics of SEM assume no extreme relative variances between variables. As described in subchapter 3.2, most variables are expressed in percentages, which means that their

scale runs from 0 to 100%. However, as illustrated in Table 3, social cohesion and trust in the police are expressed in scale scores running from 0 to 10 and the variables objective security, income, and urbanisation in relative numbers. These variables therefore use a different scale that does *not* run from 0 to 100. As these differences in scales result in great relative variances, these scales need to be converted. The scales of social cohesion and trust in the police are therefore multiplied by ten, resulting in a scale running from 0 to 100. This limits the relative variance and makes it more easy to interpret the results. Although these scales can be converted, this is not possible for the variables objective security, urbanisation and income. While the latter two might not be part of the model with the best fit statistics, the dependent variable objective security will be included in every SR model. Therefore, a fit statistic that is robust to relative variances is essential in each analysis.

5.1.4 Assumption 4: Normality

To check whether the dependent variables are normally distributed, this study has plotted both objective and subjective security. Based on the scatter chart lines of the histograms in Figure 2A and 2B, one can state that both objective and subjective security are not normally distributed. More specifically, both probability distributions are positively skewed, which means that the distribution is asymmetric and has a longer tale on the right side of the histogram (Kline, 2011). The Shapiro-Wilk normality test, that tests the null hypothesis that the study sample is derived from a normally distributed population, confirms these findings. As the distributions of objective security ($W = .88$, $p = 1.51e^{-10}$) and subjective security ($W = .88$, $p = 2.26e^{-10}$) significantly differ from a normal distribution, the study sample is not derived from a normally distributed population. Given that the default ML estimator assumes that both dependent variables are normally distributed, an estimator will need to be used that is robust to non-normality (Kline, 2011; Muthén & Muthén, 2010).

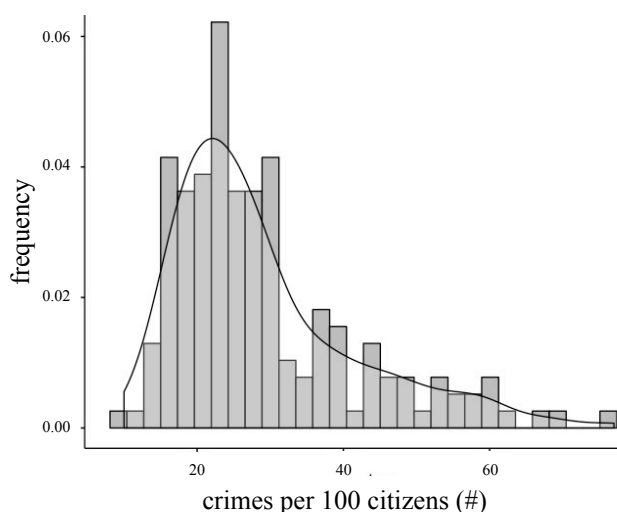


Figure 2A. Histogram Objective Security

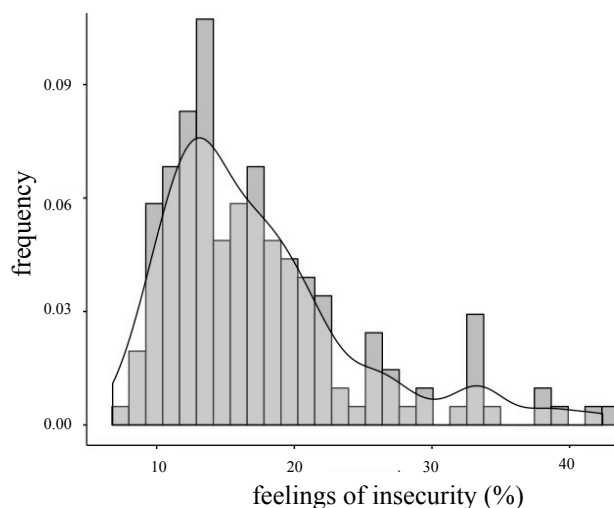


Figure 2B. Histogram Subjective Security

Table 4. Pairwise Correlation Analysis of the Predictor Variables

Variable	1.	2.	3.	4.	5.	6.	7.	8.
1. Watch schemes								
2. Alarm services	.35***							
3. Filed complaints	.13	.19*						
4. Contact police	-.15	-.20**	-.14					
5. Social cohesion	.29***	.26***	.23**	-.52***				
6. Trust in police	-.08	-.41***	-.15	.19*	.09			
7. Social incivilities	-.34***	-.46***	-.31***	.49***	-.84***	.04		
8. Income	.22**	.29***	-.11	.05	-.09	.08	.04	
9. Urbanisation	-.38***	-.35***	-.31***	.44***	-.76***	.13	.79***	.25**

Notes: *** $p < .001$; ** $p < .01$; * $p < .05$.

5.1.5 Assumption 5: Multicollinearity

The last assumption that should be checked for is multicollinearity. Table 4 provides an overview of the Pearson's r correlations between all variables. When the Pearson's r correlation coefficient is shown in italic ($r \geq .60$), it means that the corresponding variables need to be investigated in more detail to check whether the variables do not measure the same variance. Table 4 indicates that the control variable social incivilities significantly correlates with the variables social cohesion ($r = -.84$, $p < .000$) and urbanisation ($r = .79$, $p < .000$). As social incivilities and social cohesion both predict subjective security, these variables cannot be included in the same model. The control variable urbanisation significantly correlates with social cohesion ($r = -.76$, $p < .000$). This does not obstruct the analysis, as urbanisation and social cohesion do not predict the same outcome variable.

5.2 Results of Structural Regression Modelling

This subchapter explains what estimators and fit statistics should be used to assess and compare the different SR models. Then, it describes the process of SR modelling and reports on the fit statistics of each model. The regression results of the model with the best fit statistics will be assessed.

5.2.1 Choosing Estimators and Fit Statistics

When running an SR model in R , the default ML estimator produces a set of fit statistics that indicate whether the empirical data fits the theoretical model. According to Kline (2005), four fit statistics are commonly reported in case of nested models: the model chi-square (χ^2_M), the

Standardised Root Mean Square Residual (SRMR), the Root Mean Squared Error of Approximation (RMSEA), and the Comparative Fit Index (CFI). These fit statistics will be used to both assess and compare the nested models and will be discussed consecutively.⁶

The model chi-square is a traditional measure for assessing the overall fit of a model and is calculated with the following formula: $(N-1)F_{ML}$, in which F_{ML} is the minimum fit function in ML estimation (Kline, 2005). The lower the value of the χ^2_M , the better the model fits the data (Hooper, Coughlan & Mullen, 2008). Although this fit statistic is commonly reported, a limiting factor is that it is dependent on the number of observations. When this number is low, the statistic lacks power to distribute between good models and bad models (Hooper et al., 2008). Moreover, the χ^2_M assumes that the data is normally distributed. In case the data is not normally distributed, the χ^2_M is biased towards bad fit (Hooper et al., 2008). As the dependent variables of this study are not normally distributed, fit statistics will need to be used that do not assume normality. The χ^2_M will however still be reported, because - as long as the number of observations remains equal - the models experience the same bias and the χ^2_M can thus be used to compare them.

The SRMR statistic is the square-root of the difference between the residuals of the observed correlation and the hypothesised correlation (Hooper et al., 2008). SRMR is an absolute fit statistic, which means that it measures how well the hypothesised model fits when compared to no model (Jöreskog & Sörbom, 1993). The SRMR statistic is a value between 0.00 and 1.00, and, as this statistic represents the sum of the residuals of the hypothesised model and the sample model, values closer to zero indicate better fit. The value 0.08 is generally used as a cut-off point for good fit (Hooper et al., 2008). As the variables in this study have different scales (see section 5.1.3), SRMR is preferred over RMR as the latter one can only be interpreted when scales are equal (Hooper et al., 2008; Kline, 2005).

The RMSEA is also an absolute fit statistic and measures “how well the model, with unknown but optimally chosen parameter estimates, would fit the populations covariance matrix” (Hooper et al., 2008, p. 54). As this fit statistic is based on the formula $\sqrt{(\chi^2_M - df) / [df (N-1)]}$, it favours models with less parameters (Hooper et al., 2008). Note, given that this fit statistic is dependent upon the χ^2_M while the dependent variables are not normally distributed, this study will need to use the MLR estimator. This estimator produces the robust version of the RMSEA statistic,

⁶ A model is nested when one model is a proper subset of another model. As this study uses the model building method and only adds or removes one variable at the time, the models will be nested and can therefore be compared based on the four fit statistics mentioned. In case the models were not nested (e.g. based on a different set of variables), predictive fit indexes, such as the Akaike Information Criterion (AIC), should have been used (Hooper et al., 2008; Kline, 2011).

which is robust to non-normality and can therefore be used to assess the models (Hooper et al., 2008). The robust RMSEA is a value between 0.00 and 1.00, in which values closer to zero indicate good fit. 0.08 is generally used as the cut-off point (Hooper et al., 2008). In addition, the robust RMSEA provides a confidence interval that could be used when testing the hypotheses.

The Comparative Fit Index (CFI) is an incremental fit index that compares the χ^2_M of the hypothesised model with the χ^2_M of a baseline model. As opposed to the Normed-Fit Index, the CFI is also reliable when the number of observations is low. CFI values range between 0.00 and 1.00 with values closer to 1.00 indicating a good fit (Hooper et al., 2008). CFI = 0.95 is normally used as the cut-off criterion for a good fit (Hooper et al., 2008). As this fit statistic compares the χ^2_M values, the robust version of CFI needs to be used to make it robust for non-normality. The value of the robust CFI will, just as the value of the robust RMSEA, be generated by the MLR estimator.

5.2.3 Structural Regression Modelling: Finding the Model with the Best Fit Statistics

As explained, this study uses the strategy of model building to investigate what model can best explain how co-production affects the level of both objective and subjective security. At first, this study runs the most basic SR model that consists of the main explanatory variable and the two outcome variables. Based on the statistical output and the theoretical framework, this model will be further optimised by including (and possibly excluding) both mediating variables and covariates. By assessing the fit statistics, the hypothesised model that best fits the empirical data can be found and the regression output of this model can be used to test the hypotheses. An overview of what variables are included per model can be found in Appendix 4.

As a start, this study runs an SR model that only includes the latent variable co-production, composed of the indicators neighbourhood watch schemes, filed complaints, alarm services, and contact with the local police, and the dependent variables objective and subjective security. The fit statistics of this Model 1, that are shown in Table 5A, indicate that the model almost lives up to the standards of a good fit on most fit indices. For instance, the value of SRMR is .078, which is already below the cut-off point of .08. However, the value of the robust CFI is .86, which is nowhere near the cut-off point of .95. The lack of fit could be explained by the regression estimates. The estimates of the latent variable co-production show that the variable ‘contact with the local police’ appears to be a negative indicator of co-production ($B = -.931, p = .000$). If it was a good indicator of co-production in the security domain, the level of co-production would have increased by the percentage of citizens having contact with the local police. Given that ‘contact with the local police’ appears to be a negative indicator of co-production, it must be excluded from the analysis.

Table 5A. Overview of the Model’s Fit Statistics and Measures of Fit per Model

Fit Statistic	Model 1	Model 2	Model 3
χ^2 (d.f.)	41.1 (8)***	10.9 (4)*	13.5 (7)
SRMR	.078	.064	.068
Robust CFI	.860	.958	.981
Robust RMSEA (C.I.)	.175 (.120 - .235)	.118 (.043 - .198)	.087 (.000 - .152)
Used N	130	130	130

Notes: *** $p < .001$; ** $p < .01$; * $p < .05$.

To see whether excluding this variable also improves the fit statistics, Model 2 is similar to Model 1 but has excluded the indicator ‘contact with the local police’. As shown in Table 5A, the fit statistics of Model 2 indicate a better model fit than those of Model 1. Not only did the robust CFI score increase from .860 to .958, also the robust RMSEA value improved as it decreased from .175 to .118. This shows that the model fit has improved by excluding ‘contact with the local police’ as an indicator of co-production. For the upcoming models, Model 2 will be the new starting point.⁷

To optimise Model 2, other mediating variables and covariates need to be included one-by-one to see whether these variables improve the model. In Model 3, the variable social cohesion, that is expected to mediate between co-production and subjective security, is therefore added. As shown in Table 5A, some fit statistics of Model 3 indicate a better fit than those of Model 2, while others have deteriorated. For instance, the robust CFI value increased from .958 to .981, which indicates better fit, but the SRMR value also increased, while values closer to zero indicate better fit. As such, the fit statistics cannot tell which model has the best fit. In these situations, when the model that includes the mediating variable is not significantly worse than the one without, Kline (2011) states that the model with a mediated relationship needs to be supported. This means that Model 3 is considered to be the best model up until now. For sake of transparency, the regression results of both Model 2 and Model 3 will be reported in case no other model clearly has better fit statistics.

As the variable trust in the police is expected to influence both co-production and subjective security, this variable is added in Model 4. Based on the conceptual model, trust in the police is added both as a covariate of co-production and as a mediating variable between co-production and

⁷ Generally, chi-square difference tests are used to check whether a model is a significant improvement of the earlier model. However, as the data is non-normally distributed, this difference test cannot be used. Therefore, the models will be compared with each other based on the qualitative interpretations of the fit statistics that are robust to non-normality.

Table 5B. Overview of the Model's Fit Statistics and Measures of Fit per Model

Fit Statistic	Model 4	Model 5	Model 6	Model 7
χ^2_M (d.f.)	59.8 (11)***	218.2 (8)***	143.1 (12)***	22.9 (12)*
SRMR	.107	.354	.266	.073
Robust CFI	.884	.515	.745	.973
Robust RMSEA (C.I.)	.185 (.141 - .232)	.448 (.395 - .504)	.289 (.247 - .334)	.083 (.024 - .135)
Used N	130	130	130	130

Notes: *** $p < .001$; ** $p < .01$; * $p < .05$.

subjective security. The fit statistics of Model 4 are shown in Table 5B and indicate that Model 3 did not improve by adding trust in the police. Adding this variable solely as a confounding or mediating variable led to the same results. Therefore, Model 3 remains to be the best model so far.

Based on the theoretical framework, experiencing social incivilities is expected to covariate with subjective security. This control variable is added in Model 5 to see whether it improves the fit statistics. Note, as the variable social incivilities and the variable social cohesion are both predictor variables and appeared to be strongly correlated (see section 5.1.5), these variables cannot be included simultaneously. Therefore, Model 5 is built up from Model 2 and the covariate social incivilities. As Model 3 is *not* nested within Model 5, the fit statistics of Model 5 need to be compared with those of Model 2. The results, that are shown in Table 5B, indicate that the fit statistics of Model 5 are worse than those of Model 2. This means that Model 5 does not outperform Model 2. Thus, Model 3 remains to be the best fitting model and is used for the upcoming models.

In Model 6, the covariate 'income' is included as a predictor of objective security. As the robust CFI drops below .90 and the values of both the SRMR and RMSEA statistic are above .10, the inclusion of income have not improved the model. Although the inclusion of the covariate variable 'urbanisation' in Model 7 does not make the fit statistics drop below these cut-off points, the robust CFI (.973), the SRMR (.073) and χ^2_M (22.9) indicate worse fit than the fit statistics of Model 3. This means that Model 3 has proven to be the model with the best fit statistics.

Although most values of the fit statistics of both Model 2 and Model 3 have passed the cut-off points, the robust RMSEA value of both models is still not below the cut-off point of .08. An explanation for this lack of fit could be that there is a significant difference between the different forms of co-productions. As the RMSEA statistic penalises for a high number of parameters, it

would favour a model that has less forms of co-production included. To see whether the forms of co-production indeed affect objective and subjective security differently, additional regression analyses will be run after the regression outputs of Model 2 and Model 3 have been interpreted.

5.2.3 Regression Output of the Two Models with the Best Fit Statistics

The regression results of Model 2, that are shown in Table 6, indicate that the presence of co-production activities significantly reduce the number of crimes within an area ($B = -10.36$, $p < .000$). This means that co-production positively affects the level of objective security within a neighbourhood. Similarly, co-production activities reduce the percentage of citizens that regularly feel insecure in their neighbourhood ($B = -2.34$, $p = .003$), which means that the level of subjective security also increases by the presence of co-production activities.

Alongside these causal inferences, the dependent variables objective and subjective security appear to significantly covary ($B = 31.98$, $p = .003$). This means that citizens that feel secure also live in neighbourhoods that are more objectively secure, and vice versa. Contrary, citizens that feel less secure live in neighbourhoods that are objectively less secure, and vice versa. Note that the effect co-production has on both objective and subjective security thus remains significant while the two dependent variables are covarying. This means that it does not matter whether citizens or police officers perform co-production activities in secure or insecure neighbourhoods, because these activities have an effect on subjective security either way. Similarly, co-production activities could increase the objective security of citizens in neighbourhoods in which citizens feel either secure or insecure, because the effect is significant despite that objective and subjective security covary.

Table 6. Estimates of the Structural Regression Models with the Best Fit Statistics

	Model 2		Model 3	
	<i>B</i> (s.e.)	β	<i>B</i> (s.e.)	β
Regressions				
co-prod. and crimes	-10.36*** (2.84)	-.929	-13.60*** (2.376)	-1.03
co-prod. and feelings	-2.34** (.788)	-.367	3.18* (1.600)	.422
co-prod. and cohesion			3.63*** (.615)	.748
cohesion and feelings			-1.78*** (.257)	-1.15
Covariances				
obj. and sub. security	31.98** (10.59)	.956	21.63** (7.86)	1.96

Notes: N = 130; *** $p < .001$; ** $p < .01$; * $p < .05$.

When turning to Model 3, the regression results, that are shown in Table 6, show that co-production activities significantly reduce the number of crimes within an area ($B = -13.60$, $p = .000$). This means that the level of objective security within that area increases. Based on this finding, hypothesis 1 should be accepted as co-production activities indeed positively affect the objective security of citizens in the Netherlands. Alongside this result, the statistical output also indicates that, similar to Model 2, objective security and subjective security indeed significantly covary ($B = 21.63$, $p = .006$). Note, this does not mean that more objective security leads to more subjective security or vice versa. Rather, it means that neighbourhoods that are objectively more secure also appear to have higher levels of subjective security.

Despite these similarities with Model 2, the regression output of Model 3 provides an alternative explanation for how co-production activities affect the level of subjective security. The direct, negative effect co-production had on insecurity feelings in Model 2 is no longer present in Model 3, because this negative effect appears to be mediated by social cohesion. More specifically, co-production activities positively affect social cohesion ($B = 3.63$, $p < .000$) and social cohesion negatively affects the percentage of citizens feeling insecure in their neighbourhood ($B = -1.78$, $p < .000$). This means that the indirect effect is negative: co-production decreases the percentage of citizens that regularly feels insecure via the mediating variable social cohesion. This means that the level of subjective security increases, which would support hypothesis 2.

However, alongside this indirect negative effect, the direct effect co-production has on the percentage of citizens feeling insecure is, when compared to Model 2, no longer negative but positive ($B = 3.18$, $p = .047$). This means that co-production activities do not directly take away feelings of insecurity. Rather, co-production activities lead to more feelings of insecurity and therefore decrease the level of subjective security. The results thus show that co-production activities do not directly increase the level of subjective security.

When comparing this direct effect with the indirect effect, one has to look at the standardised coefficient values. The indirect negative effect has a standardised coefficient of $-.859$, calculated by multiplying the effect co-production has on social cohesion ($\beta = .748$, $p < .000$) with the effect social cohesion has on the security feelings ($\beta = -1.15$, $p < .000$), while the direct positive effect has a standardised coefficient of only $.422$. Thus, one can conclude that the total effect that co-production has on feelings of insecurity is negative, because the indirect negative effect is stronger than the direct positive effect. This means that hypothesis 2 can be accepted, as co-production activities *in the end* positively affect the subjective security of Dutch citizens. However, there are some crucial side notes to this conclusion that will be discussed in the next section.

5.2.3 Regression Output of Additional Analyses

While co-production activities thus generally lead to higher levels of security, the varying forms that were used as indicators of co-production could affect security differently. To investigate these differences, a few additional analyses need to be run. As the dependent variables are not normally distributed, generalised linear models (GLM) are used. The first analysis includes objective security and the three indicators of co-production, while the second analysis includes subjective security, the three indicators of co-production and social cohesion. As shown in Table 7, the results of the first analysis indicate that all forms of co-production significantly reduce the number of crimes. The R^2 , that is calculated by taking the inverse of the residual deviance divided by the null deviance, indicates that 41% of the variance in crime can be explained by the three forms of co-production.

The results of the second analysis, that can also be found in Table 7, show that not all forms of co-production affect the level of subjective security in the same manner. While the negative effect that the presence of neighbourhood watch schemes has on feelings of insecurity is not significant, installed alarm serviced and filed complaints appear to increase feelings of insecurity. Only an increase in social cohesion does result in less people feeling insecure. An additional analysis shows that the presence of neighbourhood watch schemes positively affects social cohesion ($B = .428$, $p = 1.54e^{-4}$), which means that these watch schemes indirectly contribute to more subjective security. Given these results, hypothesis 2 can only be excepted when looking at the total effect of the three forms of co-production that were included in this study. Due to the different individual effects and the limited content validity, one cannot state that co-production activities generally increase subjective security. As indicated by the R^2 , the three indicators of co-production, together with social cohesion, do explain 73% of the variance in subjective security.

Table 7. Estimates of the Structural Regression Models with the Best Fit Statistics

	Crimes	Feelings of Insecurity
	<i>B</i> (s.e.)	<i>B</i> (s.e.)
Neigh. watch schemes	-.952** (.290)	-.130 (.116)
Installed alarm services	-1.24*** (.214)	.182* (.087)
Filed complaints	-.480*** (.135)	.168** (.053)
Social cohesion		-1.387*** (.082)
R^2	.41	.73

Notes: $N = 130$; *** $p < .001$; ** $p < .01$; * $p < .05$.

6. Conclusion

This chapter recaps the conducted research and provides an answer to the research question by interpreting the results of the data analysis. It also outlines the study limitations and suggests some directions for future research. Both the academic and practical implications of this study will be discussed in Chapter 7.

6.1 Concluding Remarks

This study has conducted a quantitative research to systematically assess how co-production activities affect the level of both objective and subjective security in the Netherlands. Based on the statistical output, several conclusions can be drawn. The regression output of the two SR models with the best fit statistics indicated that co-production activities resulted in more objective and subjective security within the Netherlands in 2017. Whereas the number of crimes directly decreased as a result from the presence of co-production activities, these activities only decreased the level of insecurity feelings through an increase in social cohesion. Based on these results, this study concludes that both hypotheses, which stated that co-production activities positively affect the level of objective and subjective security in the Netherlands, can be accepted.

However, the statistical output also indicated that varying forms that were used as indicators of co-production could affect security differently. Therefore, additional analyses were run to see how each distinct form of the co-production affects the level of security. The statistical output of these analyses demonstrated that the three forms of co-production, being neighbourhood watch schemes, filed complaints and alarm services, all reduced the number of crimes in their area, meaning that the level of objective security increased. Contrary, only the co-production activity that was motivated by the collective interest, being the presence of neighbourhood watch schemes, reduced feelings of insecurity through increased social cohesion. The two forms of co-production that were motivated by self-interest, being installed alarm services and filed complaints, seem to have increased the percentage of citizens that regularly feels insecure. An explanation for this positive relationship could be that having some form of control over local crime does not weigh up to the feelings of insecurity that are caused by the crimes itself. It could also mean that feelings of insecurity do not increase by experiencing some form control, but rather result from increased social cohesion - as is the case with neighbourhood watch schemes. Another explanation could, however, be that the relationship indicates reversed causality, meaning that a low level of subjective security motivates citizens to start co-producing their own security. Based on quantitative research alone, it is difficult to determine which one of these three explanations is most likely to be true.

Acknowledging the different effects the various forms of co-production have on security, the research question needs to be answered with care. In fact, how co-production activities affect the level of objective and subjective security is dependent upon what type of activity one investigates. In case of subjective security, only the presence of neighbourhood watch schemes decreased the percentage of citizens having feelings of insecurity in the Netherlands, while alarm services and filing complaints did not have this effect. Thus, although co-production activities are generally expected to increase the level of subjective security, individual forms of co-production could affect citizens' feelings of insecurity differently. In case of objective security, one could state that co-production activities generally lead to more objective security given that each of the forms of co-production investigated in this study decreased the total number of crimes on the level of the local police unit. Note, given the limited content validity, this does not mean that other activities that could classify as co-production are guaranteed to have the same effect.

6.2 Study Limitations

To correctly interpret the conclusions of this study, some points of limitation need to be discussed. Firstly, an important limiting factor has been that this study was bound to data from the Security Monitor while its raw data is not publicly available. CBS only provides the data at aggregated levels, of which the local police unit is the lowest level available. Ideally, this study would have used data at the individual level, because this would have made the analysis more accurate. Accepting this limitation, it would have been helpful to have all data available on the level of local police units. However, CBS stated that the software that is used to aggregate lower level data is only for internal use (A. Plas, personal communication, May 10, 2019). To solve this issue, this study had to manually aggregate the data on income and urbanisation based on the local police unit structure.

Secondly, a limiting factor has been that questions on neighbourhood watch schemes were not part of the questionnaire of the Security Monitor, making this study dependent upon data from WABP. While this organisation has the most accurate view on how many neighbourhood watch schemes are active in each municipality, it is likely that there are groups of citizens who do have a neighbourhood watch scheme but are not registered at WABP. This means that, in reality, more watch schemes could have been present than the data used in this study suggests - limiting the reliability of the data. However, as WABP has the most complete view of the existing and active neighbourhood watch scheme apps in the Netherlands (J. Niessen, personal communication, April 26, 2019), this limiting factor is not expected to have had significant effects on the statistical output.

Still, including questions on neighbourhood watch schemes in the questionnaire of the Security Monitor would increase the reliability of the data. Specifically, it would have been valuable to know how often citizens send each other a message in the WhatsApp-groups of their neighbourhood watch scheme, how many citizens are part of a neighbourhood watch scheme, and how often participants of such schemes contact the local police when something suspicious happens. Similarly, including questions on whether citizens have installed security cameras at their own property would have increased the content validity of the variable co-production. As installing cameras is a clear form of co-production that is expected to have a deterrence effect on crime, it would have been of added value to the analysis. For now, given that alarm services fall into the same type of co-production and are expected to have the same effect as security cameras, conclusions could be drawn about its effect on security.

Thirdly, with regards to the data analysis, it has been difficult to determine whether the relationships between the independent and dependent variables indicated causality or reversed causality. In case of objective security, reversed causality would not make sense, as lower crime rates are theoretically speaking unlikely to result in more co-production activities. However, in case of subjective security, lower levels of security feelings could result in more co-production activities. Similarly, higher levels of social cohesion could also lead to more neighbourhood watch schemes as citizens already know each other and might feel comfortable to cooperate with each other. To investigate these (reversed) causalities, longitudinal research is needed. By measuring the security feelings before citizens have started to co-produce and after the co-production activity has been in place for a while, one can see how co-production activities affects security over time.

7. Discussion

This study has concluded that co-production activities in the domain of neighbourhood security are expected to positively affect the level of objective security, but do not generally increase the level of subjective security. This chapter further discusses the findings of this study by outlining both the academic and practical implications. Afterwards, suggestions for future research will be given.

7.1 Academic Implications

This study has been of academic relevance, because it investigated whether, and if so how, co-production can help to achieve certain objectives in the security domain. Knowing that co-production activities do generally contribute to objective security but not always increase the level of subjective security is relevant for academics in the security domain, because it demonstrates that co-production is not always an effective tool in obtaining pre-determined outcomes. Moreover, this research has shown that co-production activities explain a significant part of the variance in security, which forms an addition to the research done by, for instance, Van Eijk (2018) and Van der Land and colleagues (2014).

Furthermore, the finding that varying forms of co-production affect subjective security differently is academically relevant. It shows that scholars need to differentiate more between varying forms of co-production in the academic literature. In their article, Irvin and Stansbury (2004) already differentiate between the two phases of policy preparation and policy execution, but within the latter phase scholars must also start to distinguish between participative and supplemented forms of co-production. These findings are not only relevant for security researchers, but also for academic of public administration who research co-production in other policy domains.

Alongside these academic implications that are based on the conclusion, several components of this study have also been of academic relevance. Firstly, the multidisciplinary approach of this study facilitated the integration of mechanisms from different disciplines into the conceptual model. This approach has proven to be academically relevant, as it helped this study to form a complete view on the relationship between co-production activities and security. Other scholars could, when studying social issues, benefit from such an approach. Secondly, this study demonstrated how quantitative techniques can be used in the security domain and in research on co-production. The SEM techniques enables the researcher not only to test a conceptual model at once, but also allows the researcher to compare models and find out what mechanisms best explain the relationship between certain (latent) variables. This could be of help when comparing competing models.

7.2 Practical Implications

The results of this study also hold practical relevance, as the results could help police officers to optimise their policies and to reach their goals. The statistical output showed that co-production activities are an effective tool to obtain more objective security, which could be a reason for police officers to invest in such activities. For instance, by actively campaigning that citizens could help to make a neighbourhood more secure, police officers could use co-production activities to obtain their goal of providing security. However, some forms of co-production activities (e.g. alarm services, filed complaints) seem to lower the level of subjective security. This means that police officers should consider the extent to which they value objective and subjective security, given that certain co-production activities could help to increase objective security but meanwhile also reduce the level of subjective security.

When policy makers want to increase the subjective level of security, they are advised to strengthen social cohesion in a neighbourhood rather than asking citizens to get involved in co-production activities. For instance, by inviting citizens for a special event that is organised for the whole neighbourhood, police officers could strengthen the level of social cohesion. As social cohesion appears to positively affect subjective security, such events could be used as a tool to obtain certain policy goals. Similarly, co-production activities could also be used to obtain other goals, such as increased social cohesion. Given that neighbourhood watch schemes seem to contribute to social cohesion, government is advised to invest in this activity, even if the presence of neighbourhood watch schemes does not directly result in more subjective security. Note however, further research is needed to determine whether the relationship between neighbourhood watch schemes and social cohesion is based on casualty, causality or reversed causality.

Alongside police officers, the results of this study are relevant for those citizens co-producing or those aiming to foster local security. Firstly, the theoretical framework has provided insights in common advantages and challenges of co-production, and described several forms of co-production citizens could undertake to increase local security. Secondly, the statistical output indicated that co-production activities generally positively effect the level of objective security. Knowing that co-production activities are an effective tool to strengthen local security could form a motivation for citizens to keep on co-producing or to get involved in such activities in the fist place. However, this study also showed that participating in co-production activities do not generally lead to more subjective security. When citizens want to feel more secure in their neighbourhood, one could state that citizens should invest in social cohesion rather than alarm services. Note however that the preferences of citizens could differ on a case-by-case basis.

7.3 Future Research Directions

This study has conducted a quantitative research on how co-production affects the level of objective and subjective security. Further studies could try to broaden the scope of this study or conduct more in-depth research. Several research directions will be discussed in the upcoming paragraphs.

7.3.1 In-Depth Research on the Relationship between Co-Production and Security

This study investigated how varying forms of co-production affect, among other things, the objective security of citizens. Objective security was in this case operationalised as the aggregate of several types of crime, being (attempts to) violent crimes, property crimes, and vandalism offences. Further research could investigate whether co-production activities reduce the crime rates of these various types of crime differently. For instance, the presence of alarm services could decrease property crimes, but are less likely to reduce the number of vandalism offences on the streets. Further research could investigate these relationships in more detail. Moreover, further research could investigate the effect of co-production on the attempts to crimes compared with the actual crimes that take place. For instance, warnings of alarm services or neighbourhood watch schemes being active could decrease the success ratio of attempted crimes, rather than the number of attempts.

The current study concluded that two forms of co-production, being citizens installing alarm services and them filing criminal complaints at the police, did not contribute to the level of subjective security in the Netherlands. In fact, these two forms even seemed to decrease the level of subjective security, but this decline could also be explained by reversed causality. To investigate this relationship in more detail, additional qualitative research is needed. For instance, interviews or focus groups could help to determine whether reporting crimes makes a citizen feel more secure, assuming that the citizen's feelings of insecurity increased directly after the crime took place. As the quantitative data used in this study did not detail the feelings of (in)security *before* and *after* reporting a crime or installing alarm services, the current study has been unable to claim how these two forms of co-production affect the level of subjective security.

Qualitative research could also be used to provide advice adjusted to the cities they aim to help. It could be that other factors that laid out of the scope of the current research, such as the history of a city with a certain form of co-production, is determinative for the effectiveness of co-production activities. For instance, in case citizens have bad experiences with participating in neighbourhood watch schemes, this should be taken into account when the local police unit wants to

stimulate this form of co-production again. Similarly, advising citizens to install alarm services could be more effective in rich cities than in places where citizens have less financial resources.

Finally, qualitative research could be used to investigate whether citizens' motivation to co-produce matter in the definition of the relationship between co-production and security. This study assumed that citizens were willing to co-produce to increase local security. However, as explained in the theoretical framework, citizens could also have other motivations to co-produce, such as getting to know their neighbours or, more generally, contributing to society. These varying motivations might affect the relationship between co-production activities and the level of security, especially when gaining more security is not the main goal of the citizen co-producing.

7.3.2 Broadening the Scope of the Research on Co-Production and Security

Alongside in-depth studies, further research could also try to increase the external validity of this study. While this study solely analysed how co-production affects security in the Netherlands, one could also investigate whether the conclusions are applicable to the contexts of other countries. By conducting a quantitative research, testing SR models with structured means, countries can be compared with each other and one can find out whether the conclusions of this study are dependent upon, for instance, the police structure within a country.

Further quantitative research could also look at what factors, alongside co-production activities, affect the level of security and, as such, try to increase the R^2 . This research showed that 41 percent of the variance in objective security can be explained by co-production activities, whereas 73 percent of the variance in subjective security can be explained by both co-production activities and social cohesion. This means that much of the variance on both dimensions of security can be explained by variables that were not part of this study. Further research is needed to explain these variances.

Moreover, further research could investigate whether objective security leads to more subjective security and vice versa, or whether these dimensions of security are only correlated with each other. Investigating this is especially of practical relevance, because it would help the police in choosing effective measures to obtain a certain goal. In case objective security leads to more subjective security, police officers could obtain their potential goal of increasing subjective security by reducing the number of crimes. Similarly, neighbourhoods might become objectively more secure in case citizens feel secure due to, for instance, the high levels of social cohesion. Further research is needed to investigate this relationship in detail.

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Appendices

Appendix 1. Calculation of Scale Scores in the Security Monitor

This appendix explains how the scale scores ‘trust in the police’ and ‘social cohesion’ are measured and calculated. These explanations are based on CBS’ report on the Security Monitor 2017.⁸

Trust in Local Police

Trust in the police is measured by asking respondents to what extent they agreed or disagreed with the following two statements: (1) if it really matters, the police will do their utmost best to help you, and (2) if it really matters then the police is there for you. On each statement, respondents could answer ‘totally agree’ (4), ‘agree’ (3), ‘do not agree or disagree’ (2), ‘disagree’ (1), ‘totally disagree’ (0), or ‘no answer’ (missing). The scores of each answer were summed up and multiplied by 10/8, resulting in a scale score that runs from 0 to 10. The higher respondents scored on this scale, the more trust they have in the police.

Social Cohesion

Social cohesion is measured by asking respondents to what extent they agreed or disagreed with the following four statements: (1) people hardly know each other in this neighbourhood, (2) the people in this neighbourhood treat each other in a pleasant way, (3) I live in a nice neighbourhood, where there is a lot of solidarity, and (4) I feel at home with the people who live in this neighbourhood. On the first statement, respondents could answer ‘totally agree’ (0), ‘agree’ (1), ‘do not agree or disagree’ (2), ‘disagree’ (3), ‘totally disagree’ (4), or ‘no answer’ (missing). As this statement was negatively formulated, the coding scores are reversed. On the other statements, respondents could answer the same, but the coding scores were not reversed. The scores of each answer were summed up and multiplied by 10/16, resulting in a scale score that runs from 0 to 10. The higher respondents scored on this scale, the more satisfied these citizens are about these aspects of social cohesion.

⁸ For more information on this report, see: CBS (2018). *Veiligheidsmonitor 2017*. The Hague, NL: CBS.

Appendix 2. Questionnaire Security Monitor

This appendix mentions what questions from the Security Monitor questionnaire were used to collect data on the following variables: the indicators of co-production, objective and subjective security, social cohesion, trust in the police, and social incivilities.

Indicators of co-production activities

Alarm services

► **Heeft uw woning:**

	Ja	Nee
1. Extra veiligheidssloten of grendels op buitendeuren?	<input type="checkbox"/>	<input type="checkbox"/>
2. Rolluiken of luiken voor ramen en/of deuren?	<input type="checkbox"/>	<input type="checkbox"/>
3. Buitenverlichting?	<input type="checkbox"/>	<input type="checkbox"/>
4. Een alarminstallatie?	<input type="checkbox"/>	<input type="checkbox"/>

Filed complaints

For each type of crime (e.g. burglary, theft, pickpocketing, robbery, vandalism), the questionnaire asked whether the citizen had reported the last crime they experienced at the police.

Is het voorval gemeld bij de politie?

- Ja
 Nee.....

Contact with the local police

Heeft u de afgelopen 12 MAANDEN wel eens contact gehad met de politie in UW GEMEENTE? Dit kan gaan om een voorval waarvan u slachtoffer bent geworden en dat eerder in de vragenlijst al aan bod is gekomen. Dit kan ook gaan om bijvoorbeeld een bekeuring of waarschuwing, een praatje met een agent, een vergunningaanvraag, etc.

- Ja
 Nee..... ga verder naar blok **6** pagina 34

**Wat was de reden van het LAATSTE contact met de politie?
SLECHTS 1 ANTWOORD MOGELIJK.**

- Bekeuring ga verder naar vraag **4** pagina 33
 Opgeroepen als getuige i.v.m. delict ga verder naar vraag **4** pagina 33
 Waarschuwing of controle door politie
 Aangifte (via internet of persoonlijk waarbij een proces-verbaal of ander document is ondertekend)
 Verloren / gevonden voorwerpen of dieren
 Melding gedaan van verdachte situatie / delict
 Vragen om hulp, advies, informatie of vergunningen
 Sociaal contact / praatje
 Anders
 Geen antwoord ga verder naar vraag **4** pagina 33

Objective security

For each type of crime (e.g. burglary, theft, pickpocketing, robbery, vandalism), the questionnaire asked whether the citizen had experienced one or more crimes over the past twelve months.

- a |** Is er in de afgelopen 5 jaar wel eens in uw woning ingebroken of een poging daartoe?
- Ja
- Nee ga verder naar
- b |** Is dat ook in de afgelopen 12 maanden één of meer keren gebeurd?
- Ja
- Nee ga verder naar
- c |** Hoe vaak gebeurde dit in totaal in de afgelopen 12 maanden?
- 1 keer 2 keer 3 keer 4 keer

Subjective security

- a |** Voelt u zich wel eens onveilig in uw eigen buurt?
- Ja
- Nee ga verder naar
- Geen antwoord ga verder naar

Voelt u zich vaak, soms of zelden onveilig in uw eigen buurt?

- Vaak
- Soms
- Zelden
- Geen antwoord

Social cohesion

- 2 |** Kunt u ook voor de volgende uitspraken over de buurt waarin u woont aangeven in hoeverre u het eens bent?

	Helemaal mee eens	Mee eens	Niet mee eens en niet mee oneens	Mee oneens
1. De mensen in de buurt kennen elkaar nauwelijks.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. De mensen in de buurt gaan op een prettige manier met elkaar om.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. Ik woon in een gezellige buurt waar mensen elkaar helpen en dingen samen doen.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. Ik voel me thuis bij de mensen die in de buurt wonen.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Trust in the police

Kunt u voor de volgende uitspraken over het functioneren van de politie in het algemeen aangeven in hoeverre u het hiermee eens of oneens bent?

	Helemaal mee eens	Mee eens	Niet mee eens en niet mee oneens	Mee oneens	Helemaal mee oneens	Geen antwoord
1. De politie weet hoe ze criminelen moeten vangen.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. De politie wil contact hebben met burgers.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. De politie houdt rekening met de wensen van de samenleving.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. De politie werkt goed samen met de bewoners.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5. Als het er echt om gaat, dan is de politie er voor je.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6. De politie is makkelijk te benaderen.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7. De politie informeert de burgers.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8. De politie bestrijdt succesvol de criminaliteit.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9. Als het er echt om gaat, zal de politie het uiterste doen om je te helpen.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Social incivilities

Er volgt nu een aantal vormen van overlast die in uw buurt zouden kunnen voorkomen. Kunt u telkens aangeven of dit in uw buurt voorkomt en zo ja, in welke mate u hier zelf overlast van ervaart?

Komt het volgende weleens voor in uw buurt?	In welke mate ervaart u hier zelf overlast van?			
	Veel overlast	Een beetje overlast	Geen overlast	Geen antwoord
8. Dronken mensen op straat <input type="checkbox"/> Ja → <input type="checkbox"/> Nee	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9. Drugsgebruik of drugshandel, bijvoorbeeld op straat of in coffeeshops <input type="checkbox"/> Ja → <input type="checkbox"/> Nee	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10. Hinder van horecagelegenheden zoals cafés, restaurants of snackbars <input type="checkbox"/> Ja → <input type="checkbox"/> Nee	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11. Overlast door buurtbewoners <input type="checkbox"/> Ja → <input type="checkbox"/> Nee	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
12. Mensen die op straat worden lastiggevallen <input type="checkbox"/> Ja → <input type="checkbox"/> Nee	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
13. Rondhangende jongeren <input type="checkbox"/> Ja → <input type="checkbox"/> Nee	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Appendix 3. The Dutch Police Network

The Dutch police network consists of 10 regional units. Each of these regional units is further divided into several districts (see Figure 3). In total, the country has 43 districts. Within these districts, local police units are responsible for the security of the Dutch neighbourhoods. The Dutch police network counts 167 local police units (see Figure 4).



Figure 3. Map of the Netherlands divided into 10 Regional Units and 43 Districts⁹

⁹ Source: CBS (2018). *Veiligheidsmonitor 2017*. The Hague, NL: CBS.

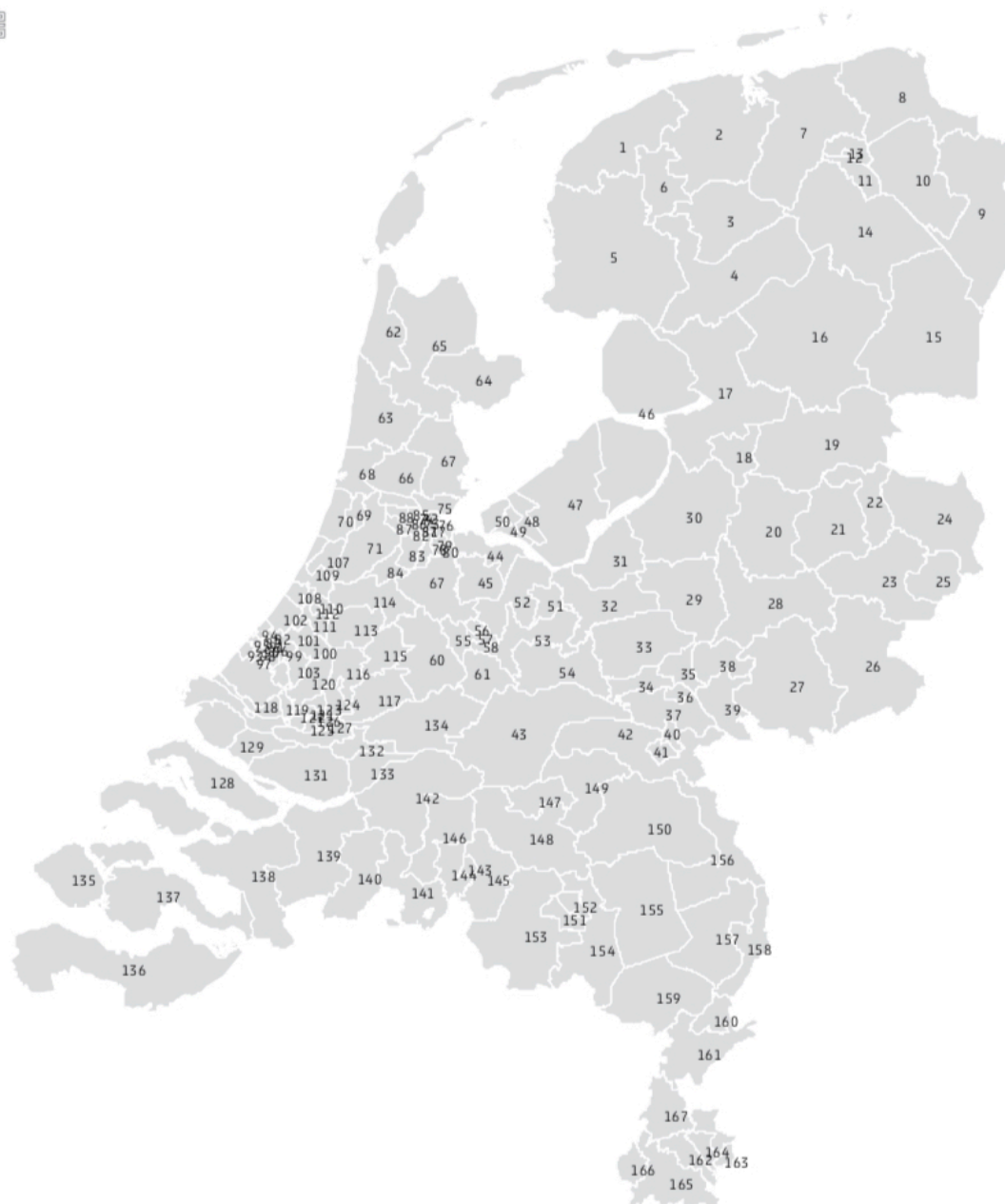


Figure 4. Map of the Netherlands divided into 167 local police units¹⁰

¹⁰ Source: CBS (2018). *Veiligheidsmonitor 2017*. The Hague, NL: CBS.

Appendix 4. The Process of Model Building: Seven Nested SR Models

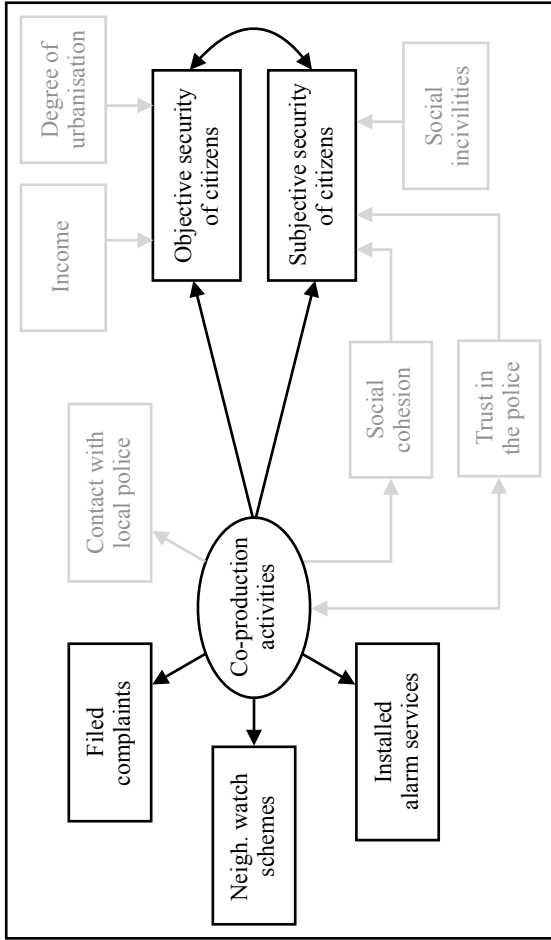


Figure 5B. Model 2

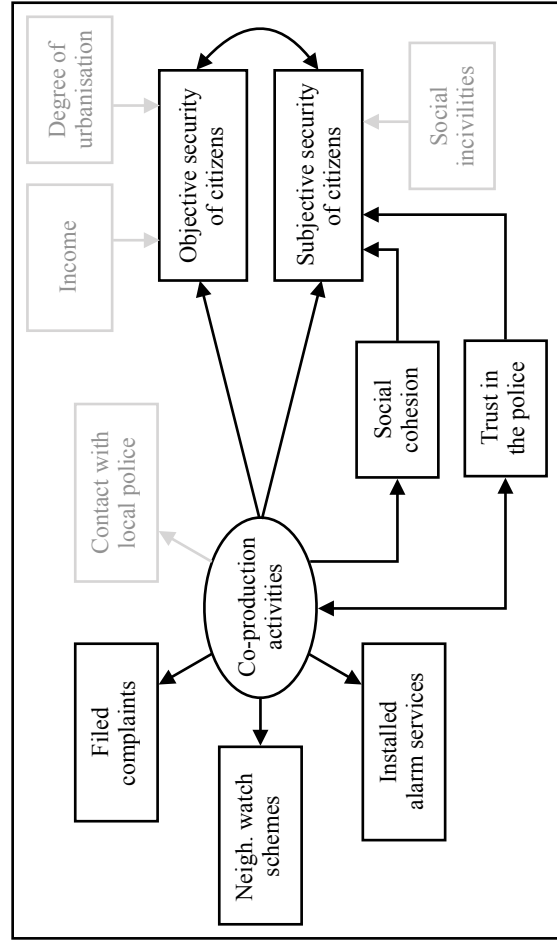


Figure 5D. Model 4

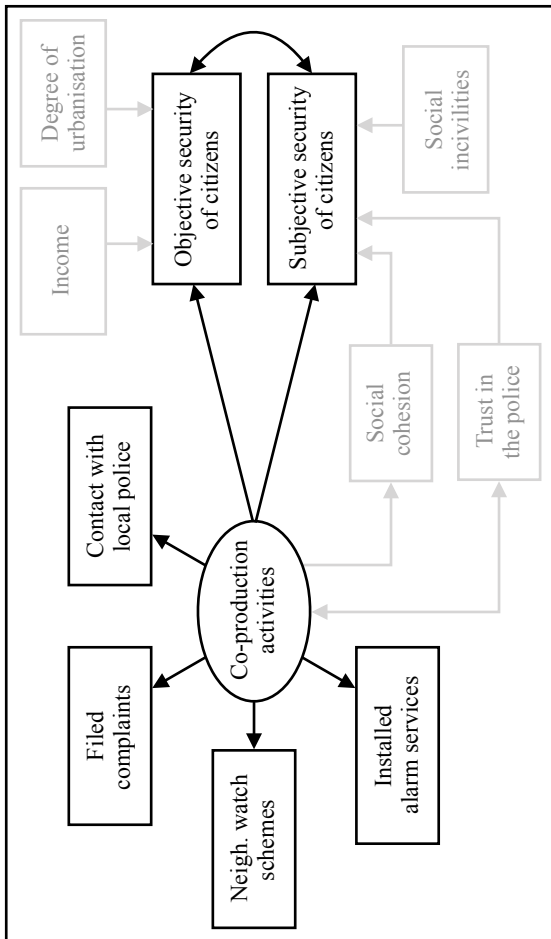


Figure 5A. Model 1

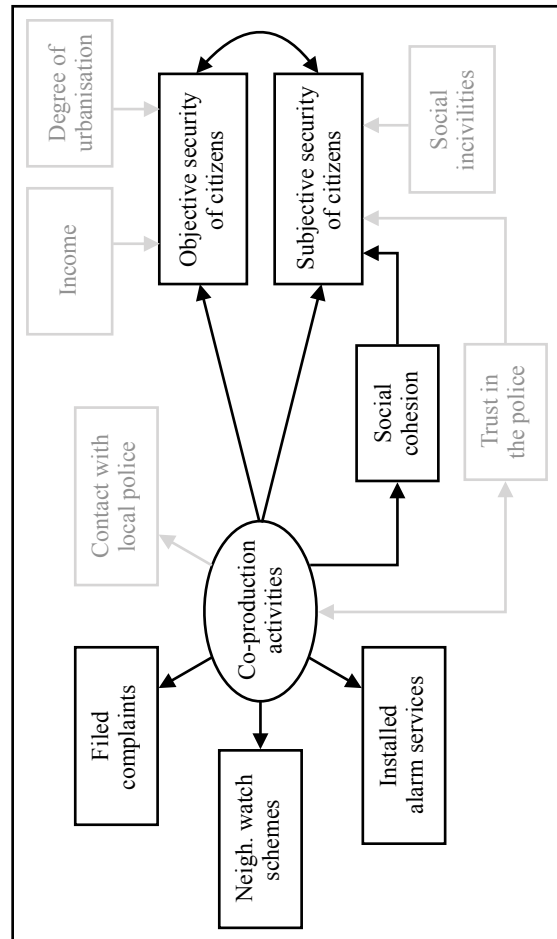


Figure 5C. Model 3

