ALTERNATIVE SERVICE DELIVERY ARRANGEMENTS:

EMPIRICAL ESSAYS ON THE COPRODUCTION OF LAW ENFORCEMENT

by

SEONG CHEOL KANG

(Under the Direction of Laurence J. O'Toole, Jr.)

ABSTRACT

The use of volunteers constitutes a major service delivery alternative that local governments can utilize to generate benefits such as cost savings, increased service provision, and improvement of community relations. However, there is little information regarding why local governments adopt volunteer programs, what is the extent to which public agencies attain such benefits, and why citizens choose to volunteer in local government service delivery programs. This dissertation seeks to answer these questions by using two different law enforcement survey datasets to conduct three quasi-experimental analyses. More specifically, this study is composed of three empirical essays that investigate the following questions: first, the determinants of local law enforcement agencies' adoption of volunteer officer programs; second, the impact of volunteer officers on organizational performance; and finally, the correlates of local residents' participation in voluntary citizen patrols.

Several key findings of this study include the following. In the first empirical chapter, the results show that a council-manager form of government, size of the agency budget, and community policing initiatives are positively associated with greater use of volunteer officers. Increased tax burden and union strength are negatively associated with greater use of volunteer

officers. For the second empirical chapter, the findings demonstrate that an increase in the ratio of volunteer officers is negatively associated with police performance as measured by the clearance rate. Finally, the results for the third empirical chapter indicate that expressive motives such as greater community safety, the expectation that one's efforts will lead to a decrease in community crimes, and the perception of the severity of crime problems are positively associated with more active participation in local voluntary citizen patrol. These findings provide useful information about why local governments use volunteers, the impact of volunteers on organizational performance, and the motivations behind why citizens participate in local government initiatives.

INDEX WORDS: Dissertation, Public Management, Public Administration, Volunteer, Local Government, Law Enforcement, Public Safety, Performance Measurement, Coproduction

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DEDICATION

This dissertation is foremost dedicated to God in heaven who gave me the wisdom, knowledge, strength, and perseverance to pursue my doctoral studies. To my wife, In Kim, who was always there for me. To my son, Nathan Jingu Kang, who brought us joy. To my parents, Hwi-Won Kang and Hyun-Sook Choi, for their unending love and support. And to my parents-in-law, Chang-Sub Kim and Yoon-Hee Jung, for their encouragement and support.

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CHAPTER 1

INTRODUCTION

In recent years the concept of coproduction has emerged as a salient topic for public administration research (Brandsen and Honingh 2015; Kettl 2015; Vooberg et al. 2014). During the 1970s and 1980s coproduction had been advocated for its potential to improve various aspects of service delivery such as cost savings and better service provision as well as political benefits including government responsiveness and citizen participation (Brudney and England 1983; Percy 1984; Whitaker 1980). Despite such advantages, early coproduction scholarship was overshadowed by traditional models of service delivery (Mosher 1980; Ostrom 1996). By the late 1980s, public administration became dominated by market-based models such as privatization and contracting (Alford 1998). Aside from a limited number of scholarly efforts (i.e. Hupe 1993; Moore 1995), coproduction research temporarily ceased for a decade until the growing skepticism regarding New Public Management and other market strategies led to a number of scholars to revisit coproduction (Alford 1998; Ryan 2012). Since the early 2000s there has been a rapid reemeregence of coproduction scholarship alongside broader developments within public administration such as networks (O'Toole 1997; 2015), hollow state (Milward and Provan 2000), New Public Service (Denhardt and Denhardt 2000), and governance (Boyte 2005; McGinnis 1999; Peters and Pierre 1998; Salamon 2000). Due to the hiatus in coproduction research between the early 1980s and 2000s, much of the recent scholarship has focused on revisiting the concept, building frameworks, and developing propositions about coproduction.

Efforts to venture into empirical testing and theory development using large-N data have been fairly recent.

Given the renewed interest in coproduction research to address a variety of public administration issues, this study is motivated by the need to engage in further empirical testing of coproduction theories. In particular, there is more need to engage in large-N analysis in light of the fact that a majority of existing empirical studies on coproduction have consisted of case studies that provide insight in specific contexts but lack generalizability. This can be attributable to the lack of data that measure large-scale coproduction efforts as well as the ambiguity of definitions that constitute coproductive activities. This is not to say that studies with large sample sizes have not been conducted at all. For instance, Riccucci et al. (2015), Jakobsen (2013) and Jakobsen and Andersen (2013) utilize randomized experiments to explore coproduction within a single jurisdiction, while Clark et al. (2013) analyze service requests made in the city of Boston. Hong (2016) examines police forces across England and Wales, whereas Parrado et al. (2013) explore international data from five different countries. While such studies provide rigorous testing of coproduction propositions, methodological issues include weakness of external validity across geographic or policy contexts, or the difficulty of controlling for institutional variations across countries. Therefore, this dissertation seeks to fill this gap by performing a large-N empirical analysis of coproduction programs in the realm of public safety.[1] Two of the essays in this dissertation derive data from a national sample of law enforcement agencies within the United States. The third essay derives data from a South Korean law enforcement survey to examine citizen participation in volunteer citizen patrols, providing insight on coproduction from an international perspective.

[1] Law enforcement, public safety, public security and policing are similar terms that will be used interchangeably throughout this dissertation.

Using these datasets, I explore three research questions. First, what are the factors that influence public agencies to adopt coproduction initiatives? Second, what is the impact of such initiatives on service outcomes? Finally, since coproduction requires citizens to jointly produce services, what are the motivations behind citizen coproduction? To address these research questions, this dissertation lays out the following research design. Chapter two provides a broad overview of the coproduction literature as well as coproduction in law enforcement. Chapter three discusses the research design and methods. Afterwards, the subsequent chapters empirically analyze each of the proceeding three research questions.

Chapter four, the first empirical essay, explores the factors that affect government agencies to adopt coproduction by using the Law Enforcement Management and Administrative Statistics (LEMAS) survey produced by the Department of Justice (DOJ). The variable of interest concerns the use of volunteer police officers, otherwise known as reserve/auxiliary personnel. This corresponds to one form of coproduction, collective coproduction, which involves activities such as mass citizen-volunteer programs where citizens participate in an organized or institutionalized capacity and are undertaken in direct cooperation with public agencies (Brudney and England 1983). The chapter borrows from several theories in the nonprofit literature such as government failure theory, interdependence theory, market failure, social capital, and social cohesion to model a demand and supply framework that analyzes the determinants of coproduction. In addition, the analysis adds an additional set of measures that highlight the role of public managers and organizational activities. The dependent variable consists of the ratio of volunteer police officers to full time paid sworn personnel.

Chapter five, the second empirical essay, explores the use of volunteer officers within the context of the O'Toole-Meier model of management to estimate the impact of coproduction on a

measure of police performance, clearance rates. Defined as the percentage of crimes cleared by arrest, clearance rates are deemed a stronger measure of police performance compared to other outcomes such as crime rates which are influenced by various socio-economic factors and are considered beyond the control of what police organizations can directly influence. In addition to the internal and external activities that police managers engage in, volunteer officers are considered a resource available from the environment. The goal of this chapter is to test the hypothesis that volunteer officers will be positively associated with clearance rates if used as complements, while they are negatively associated with clearance rates if used as substitutes.

Chapter six which is the third empirical essay explores the factors that motivate citizens to engage in coproduction (Alford 2002; Verschuere 2012). Based on the literature exploring coproductive motivations, the chapter draws from theories on public choice theory, volunteerism, citizen participation, public service motivation (PSM) and others to provide a framework for exploring citizen motivations to coproduce. The empirical data is derived from a South Korean survey that examines local residents' participation in voluntary citizen patrols. The survey contains questions about volunteers' motivations for participating, their roles within the organization, demographic information, and other personal characteristics relevant to their participation in citizen patrols.

The final chapter summarizes the principal findings from the three empirical chapters, implications for research, and limitations of the dissertation.

CHAPTER 2

LITERATURE REVIEW

Emergence of the Coproduction Concept

The concept of coproduction has been applied to the study of both public and private goods, due in large part to the underlying shared notion that users or consumers are actively involved in co-producing a good or service (Bovaird 2007; Brudney and England 1983; Peters, Bodkin and Fitzgerald 2012). In the private sector, the concept was initially used in the context of industrial and service markets in which coproduction was discussed from an efficiency perspective where cooperation between customers and firms could result in a competitive advantage for firms (Fitzsimmons 1985; Solomon 1983). Scholars in public administration had also explored coproduction as a solution for dealing with increasing pressures to provide better quality services while reducing costs (Brudney and England 1983; Parks et al. 1981; Whitaker 1980). While coproduction research in the public sector experienced a temporary hiatus from the mid-1980s, the marketing literature continued to grow during the 1990s and beyond in which coproduction expanded to the context of consumers (Firat 1991; Firat el al. 1995; Solveig 1996; Wikstrom 1996). Subsequent literature went further to concoct terms such as "value co-creation" in which value is not only contained in the finished product but rather is defined and co-created, hence "co-produced" with consumers (Vargo, Maglio and Akaka 2008). In more recent years, the marketing literature has proceeded to include empirical investigation of the benefits of coproduction between firms and consumers (Ansari, Koenigsberg, and Stahl 2011; Curien and Moreau 2007; Dholakia et al. 2009; Etgar 2008; Martin 2010; Moeller et al. 2013; Roggeveen,

Tsiros and Grewal 2012; Trinh, Kachitvichyanukul, Khang 2014; Troye, Villads and Supphellen 2012; Tung and Yuan 2008; Willmot 2010; Zine et al. 2014).

In the public sector, public-private differences such as complex and ambiguous public goals (Rainey and Bozeman 2000), diverse political and economic settings that affect organizational dynamics, and the different types of goods and services that are produced lead to an emphasis of different values and standards of analysis (Aligica and Tarko 2013; Bovaird and Loeffler 2012). This was evident in early scholars' efforts to define coproduction and the types of goods or services that coproduction applies to. For example, Whitaker (1980) discusses how public services involve the delivery of activities that seek to change the behavior of the recipients. Examples include education, healthcare or social welfare where the ultimate outcome is not a finished product but rather a change in behavioral attributes of recipients such as the attainment of new knowledge or skills, acquisition of healthier habits, or a reduction in tendency to engage in delinquent behavior. In such cases, citizens must be actively involved in coproducing the service with the service agent to derive the desired outcome.

The United States' geographic, political and socioeconomic diversity results in a public domain "characterized by hybridity, heterogeneity, and institutional diversity of mixed arrangements, quasi-markets, and quasi-governments" (Aligica and Tarko 2013: 726). During the 1970s the Ostroms recognized this in their research on metropolitan governance in which they observed several phenomena that ran counter to the traditional mode of centralized public service delivery (Ostrom and Whitaker 1973; Ostrom and Parks 1973; Ostrom, Parks and Whitaker 1974; Ostrom 1996). For instance, in their analysis of urban governance problems, they recognized the importance of bureaucratic discretion of many street-level bureaucrats such as police officers and social workers (Lipsky 1973), the provision of services by multiple

organizations consisting of both public and private entities, and the active participation of clients in influencing the outcome of services. Moreover, their findings indicate that collaboration between service providers and service users is a key factor that determined the effectiveness of service delivery (Aligica and Tarko 2013). Coproduction research began to expand during this period when others began exploring different aspects of coproduction such as its definition and scope (Brudney and England 1983; Ferris 1984; Kiser 1984; Levine 1984; Parks et al. 1981; Percy 1978, 1984; Sharp 1980; Whitaker 1980), methodological issues (Rosentraub and Sharp 1981; Warlow, Harlow, and Rosentraub 1982), benefits and costs (Brudney 1983), application to municipal government services (Brudney 1984; Rich 1981), and other empirical issues (Ferris 1988; Rosentraub and Warren 1987; Sundeen 1988; Wilson 1981).

Reemergence during the 2000s

While the 1970s and early 80s produced a significant amount of conceptual and theoretical development, this nascent phase of co-production research was mostly limited to highlighting its potential as an alternative to centralized service delivery. Unlike co-production research in the private sector, market-based theories such as New Public Management emerged as the dominant paradigm within public administration during the late 1980s and 1990s. It was not until the 2000s and beyond that the limitations of private-sector management and other public service delivery challenges led to a renewed interest in co-production (Alford 1998; Bovaird and Loeffler 2012; Evans 1996).

While the recent revival is somewhat a reiteration of the basic concepts and propositions already proposed in the early works, the key difference is the shift in the environment in which the literature is reemerging. The past two decades have witnessed a broader awareness

concerning the increasingly "complex, plural and fragmented nature of public policy implementation and service delivery" (Osborne 2010: 6). If early notions of coproduction were deemed as "radical" within existing state mechanisms that were largely hierarchical in nature (Ostrom 1996: 1073), recent scholarship has been assisted by fundamental shifts in the political and global environment in which government services are being produced. Public administration has undergone a so-called "mixing" or "interweaving" of the public, private and third sectors in the delivery of public services (Kettl 2015: 220; Koppell 2010: 547). This can be recognized through the development of broader themes such as networks (O'Toole 1997; 2015), hollow state (Milward and Provan 2000), New Public Service (Denhardt and Denhardt 2000), and public governance (Boyte 2005; McGinnis 1999; Peters and Pierre 1998; Salamon 2000). These shifts have also been accompanied by a gradual acceptance by practitioners that such transformations are inevitable (Osborne 2010). Therefore, public managers have had to readjust their roles as they find themselves increasingly situated in complex networks and communities of different actors (Brandsen and Honingh 2015). For instance, the Coalition Government in the United Kingdom set forth the banner of the "Big Society" in 2010, which is a political discourse that emphasizes the empowerment of communities and local government and encourages the citizenry to play a more active role in society (Bunyan 2012; Cabinet Office 2010; Evans 2011). In short, it is within this shifting horizon and increased support from the public administrative establishment that scholars are revisiting coproduction as an alternative to existing mechanisms through which public services are delivered (Kettl 2015).

Much of recent literature has been conceptual or case-based studies that discuss the importance of coproduction (Alford 1998; 2002; 2009; Brandsen and Pestoff 2006; Pestoff 2009), clarification of the concept (Aligica and Tarko 2013; Bovaird 2007; Boyle and Harris

2009; Needham 2007), arguing for coproduction as an inalienable part of service delivery (Osborne et al. 2012; Osborne and Strokosch 2013), benefits and costs (Bovaird and Loeffler 2012; Brewer and Grabosky 2014), and reviews and directions for future research (Verschere et al. 2012; Voorberg et al. 2014). Some empirical studies utilize large-N data to explore major propositions such as factors that influence the extent to which local governments use volunteers for public services (Ferris 1988), factors that influence citizens to coproduce (Van Eijk and Steen 2014), combination of representative bureaucracy and coproduction (Hong 2016; Riccucci et al. 2015), and distributional or equity consequences (Clark et al. 2013; Jakobsen 2013; Jakobsen and Andersen 2013).

Meanwhile, a substantial amount of studies in specific policy realms such as healthcare, education, policing, social welfare and community development have been conducted that are not necessarily under the specific banner of "coproduction," but contain elements of active citizen involvement in service delivery. For instance, the involvement of end users in healthcare have been the subject of significant scholarly attention (Vooberg, Bekkers, and Tummers 2014). Other areas include the role of citizen volunteers in emergency medical response (EMS) organizations (Andersen and Clary 1987), active partners in the management of their own care and in service innovation and development (Philips and Morgan 2014; Szebeko and Tan 2010), and relationship building with disabled patients (Daniel et al. 2014). Some have investigated the use of social campaigns and marketing tools to raise health awareness (Braybrook et al. 2011; Cuddihy 2015), as well as to promote the participation of informal "carers" through social media (Farzanegan, Hadi and Anderson 2014). Other areas of active user involvement include mental health (Davies et al. 2014; Gillard et al. 2012), collaborative research with end-users of knowledge in health policy research (Kothari and Wathen 2013), community-based housing and

health and social care services (Stacey and Hembrow 2013), addiction aftercare (Tober et al. 2013), and third sector organizations in the formation and management of health innovation networks (Windrum 2014). In community development, scholars have explored collaboration with local residents and end users in areas such as agriculture (Carolan 2006), environmental issues (Kasymova and Gaynor 2014), industrial recycling networks (Korhonen, Niemeläinen and Pulliainen 2002), natural resource management (Cullen-Unsworth et al. 2010; Flores-Diaz et al. 2014; Maynard 2015), sustainable rural communities (Steinerowski and Steinerowska-Streb 2012) and urban regeneration (Carter 2013). Other areas include grassroots organizations and federations utilizing co-production as political strategies (Mitlin 2008), or coproduction as a vehicle for community members to build social capital (Powell and Dalton 2003).

Coproduction and Law Enforcement

Law enforcement and policing was one of the early policy realms that public administration scholars first observed coproduction processes and discussed its significance (Ostrom and Whitaker 1973; Ostrom and Parks 1973; Ostrom, Parks and Whitaker 1974; Parks and Ostrom 1981). Based on several years of observing metropolitan police services, Ostrom and colleagues noticed how multiple public jurisdictions and private firms were involved in producing immediate response services, while other activities such as training and forensic analysis were being provided by local universities and hospitals. They also commented on how the production of a service, as opposed to a good, required the active participation of those who were receiving the service. Subsequently they developed the term “coproduction” to describe the synergetic relationship between regular producers and clients (Ostrom 1996: 1079). In fact, all of the coproduction studies produced during the 1970s and 1980s mention public safety or policing

in one way or another as an example of coproducing public services. Others have focused specifically on the coproduction of policing. For instance, Percy (1978) provides a framework for outlining various coproduction activities between citizens and police agencies, while Warren et al. (1982) examine survey data on citizens' participation in the production of personal safety. Rosentraub and Warren (1987) assess police officer attitudes toward citizen involvement to outline some of the pros and cons of coproducing public safety.

Although law enforcement is one type of public service, the above scholars were situated under the umbrella of public administration. Other disciplines such as criminal justice or policing studies also engaged in the debate about coproducing law enforcement services, albeit for different reasons and under the more commonly known banner of community policing (Kappeler and Gaines 2012; Oliver 2007). Reform efforts can be traced to the 1960s in which the anti-war protests and civil rights movements witnessed the inability of police to handle urban unrest in an effective and appropriate manner and so elicited calls for largescale police reform (DOJ 1994). Between 1968 and 1973 three Presidential Commissions made numerous recommendations for police reform, while agencies within the Department of Justice urged for research and innovation across the country and allocated grants to support criminal justice education (Reisig 2010). Reformers sought to build collaborative partnerships between law enforcement agencies and community organizations to address crime and related problems, and others called for changes to policing strategies such as the establishment of teams of officers in various local beats or the reemergence of foot patrols in locales (Bloch and Specht 1973; Pate 1986; Trojanowicz 1983). Much like the developmental phases of the coproduction literature, nascent studies in community policing sought to move beyond the traditional policing model and advocate for more proactive

and collaborative approaches with the public (see e.g., Greenwood et al. 1977; Kelling et al. 1974; Kelling and Moore 1988; Sparrow 1998; Spelman and Brown 1984).

The Violent Crime Control and Law Enforcement Act of 1994 established the Office of Community-Oriented Policing (COPS) Office at the Department of Justice (DOJ). This is a federal initiative launched in 1994 to undergo organizational reforms such as decentralization and endowment of greater autonomy to officers to implement the Community-Oriented Policing program (community policing). In addition, police agencies are granted funds to hire and train community policing officers, advance local partnerships, and implement innovative programs that could productively engage civilians in public safety (DOJ 1994). Since 1994, more than 14 billion dollars have been allocated to countless law enforcement agencies across the U.S. with the goal of hiring and training community policing officers, advancing partnerships, and implementing innovative programs that could actively engage civilians in public safety (DOJ 2014).

This initiative has been accompanied by the growth in scholarly works that examine various aspects of community policing. Studies include analysis of the impact of COPs grants or management on crime rates or other performance (Evans and Owens 2007; Greenberg 2001; Lilley and Boba 2008; Nicholson-Crotty and O'Toole 2004; Worrall 2008; Worrall and Kovandzic 2006, 2010; Zhao et al. 2003), effects on community processes and behaviors (Kerley and Benson 2000; Schnebly 2008), influence on internal organizational change (Zhao et al. 2003), descriptive or case studies that focus on specific demographics or jurisdictions (Bromley 1999; Quinton and Rachel 2007; Sharp and Atherton 2007; Smith et al. 2001; Williams 1998), experimental research on different community policing strategies (Groff et al. 2013), surveys of officers' and citizens' perceptions about community policing (Adams et al. 2002; 2005; Cordner

and Biebel 2005; Lord and Friday 2008; Williams et al. 2015), factors that shape the adoption of community policing policies and strategies (Burruss and Giblin 2014; Chappell 2009; Lee and Lee 2008; Morabito 2010; Peaslee 2009; Renauer et al. 2003), design and implementation challenges (Brewer and Grabosky 2014; Dicker 1998; Mastrofski 2006; Walker 2012; Williams, Kang and Johnson 2015), factors that affect citizen involvement in crime prevention (Carr 2012; Osgood 2011; Pattavina et al. 2006), racial disparities in perceptions of community policing (Thomas and Burns 2005), linkage between coproduction outcomes and other types of social capital (Scott 2002), and conceptual or methodological discussions (Fenwick 2012; Reisig 2010; Scheider et al. 2009).

Despite not being under the heading of "coproduction," such a broad range of studies examining different facets of community policing attests to the widespread significance of coproduction by law enforcement agencies in the United States. While coproduction and community policing have different origins as well as objectives, a key overlapping element between the two is that both seek to actively engage citizens through partnerships and other forms of involvement in coproducing public safety (Cordner 2014). Therefore, community policing can be considered a government-sponsored program that contains significant elements of coproduction. Through the LEMAS survey which is conducted every five years since 1987, this enables scholars to empirically measure the extent to which the government has been involved in the coproduction of public safety.

Meanwhile, one form of coproduction that has not been explored in detail is the use of volunteer police officers, otherwise known as reserve/auxiliary personnel. Aside from the early coproduction literature, the role of volunteers in public services has not been dealt with extensively by more recent works. However, prior works have noted how a significant number of

volunteers are utilized by public agencies (Brudney 1990; Brudney and Warren 1990). The LEMAS survey gathers data on the number of unpaid sworn reserve/auxiliary officers utilized by law enforcement agencies. Otherwise known as reserve/auxiliary personnel, volunteer officers are defined as "trained civilians who volunteer their time to conduct law enforcement duties for the agency" (U.S. Department of Justice 2013b: B4). While these are sworn positions endowed with law enforcement authority, a key feature is that they volunteer on an unpaid basis. On the one hand, the criminal justice literature discusses the concept of "civilianization" which centers on resorting to alternative manpower resources to reduce costs and improve services. However, while early studies include volunteers in this labor pool (Berg and Doerner 1988; Greenberg 1979), more recent studies refer to civilianization as the use of non-sworn paid civilians usually employed in specialized positions in communications, forensics, computer specialists, and other support functions (Alderden and Skogan 2012; Forst 2000; Maguire et al. 2003). Therefore, conceptually, volunteer officers match the description of prior studies on collective coproduction programs that incorporate "large numbers of citizen volunteers into the service bureaucracy as part of the regular public workforce" and are "matched with a set of work activities in service agencies for which they are trained or otherwise judged competent" (Brudney 1984: 475).

On a practical level, there is great variation in terms of the level of authorization across states as well as how different agencies utilize volunteer officers for different purposes (Wolf, Albrecht and Dobrin 2015; Wolf, Holmes and Jones 2016). Some volunteers may be fully sworn and certified, while others may possess limited or no certification. Agencies, such as the Los Angeles Police Reserve Corps, may authorize volunteer officers to carry arms and engage in formal arrests. Others, such as the New York City Police Department Auxiliary Police Program, may restrict the use of lethal force. Despite these variations, the significance for coproduction

research lies with the fact that this group of coproducers are unpaid, engage in the delivery of services on behalf of other citizens, and serve as a bridge between professional service agents and the community (Bovaird and Loeffler 2013; Frederickson and Levin 2004).

Summary

This section explores how the literature on coproduction developed in two major phases. First, the early phase during the 1970s and 1980s witnessed the emergence of the coproduction concept within public administration. Second, in more recent years, the concept has been reexamined alongside broader paradigmatic shifts such as networks, hollow state, and new public governance. This section additionally covers some of the work on coproduction in public safety. Considering how the literature has developed until now, this dissertation aims to address some methodological limitations of prior studies by engaging in large-N testing of several coproduction propositions. The next chapter proceeds to outline the research design by defining the concept of coproduction that will be used throughout the rest of this dissertation. It also discusses the significance of the empirical dataset for coproduction research, and explores each of the research questions for the subsequent empirical essays.

CHAPTER 3

RESEARCH DESIGN AND METHODS

Scholars have offered several definitions of coproduction (i.e. see Bovaird 2007; Brudney and England 1983; Osborne and Strokosch 2013; Ostrom 1996; Parks et al. 1981; Whitaker 1980). For instance, some propose a narrow definition which limits coproduction to the relationship between public employees and citizens as service users (Joshi and Moore 2004; Parks et al. 1981). Others delineate a broad definition by including volunteers as coproducers (Alford 2002; Bovaird 2007; Bovaird and Loeffler 2013). Although there is significant overlap among definitions, one key difference is that service users directly consume a service and derive personal benefits, whereas volunteers denote citizens who delivery services on behalf of others and do not derive direct, material benefits from coproducing (Alford 2002). In terms of distinguishing between different types of coproduction, Brudney and England (1983) differentiate between individual, group and collective activities. Brandsen and Honingh (2015) categorize according to whether citizens are involved in core or complimentary activities and whether coproduction involves the design or implementation phase or both. By distinguishing between different definitions and identifying core dimensions, Brandsen and Honingh derive the following definition: “Coproduction is a relationship between a paid employee of an [public] organization and [groups of] individual citizens that requires a direct and active contribution from these citizens to the work of the organization” (2015: 5).

Despite the variations in defining coproduction, the general consensus among public administration scholars is that the term entails the active involvement of users such as citizens or

clients in the production of public services (i.e. Brudney and England 1983; Bovaird 2007; Boyle and Harris 2009; Ostrom 1996; Ryan 2012; Warren et al. 1982; Whitaker 1980). Examples of coproduction include citizens placing garbage in front of houses for curbside pickup, residential involvement in neighborhood watches, and parents being actively involved in school programs (Wilson 1982). Such activities have been advocated for their potential to improve various aspects of service delivery such as service quality, cost savings, government responsiveness, citizen enlightenment, and citizen participation (Percy 1984). In addition to political benefits from citizen participation or greater accountability, economic modeling has shown how the contribution of *consumer* producer input, as opposed to the sole provision of goods by public agencies, can reduce the amount of *regular* producer input thereby resulting in economic gains such as tax-savings and enhanced efficiency (Parks et al. 1981). However, on the one hand, there are criticisms that such activities on an individual level are "little more than the behavior expected of citizens in an urban society" (Warren et al. 1982: 42). Thus, it is difficult to envision how exactly does coproduction benefit public organizations or society as a whole. On the other hand, when these activities occur on a broader scale or are formally incorporated through government initiatives to directly involve citizens in producing services, coproductive activities become collective goods in which the benefits are enjoyed by overall society (Brudney and England 1983).

To expand upon the relevance of coproduction for public organizations, Figure 1 provides a comparison between traditional and coproductive service delivery arrangements. The traditional model consists of the public agency as the sole provider of goods and citizens / customers as passive recipients who do not have any role in the production process. This is not to say that there is absolutely no input at all, for citizens and customers can provide input during

policy formulation stages or feedback through mechanisms such as citizen satisfaction surveys. However, in the traditional model, citizens are reverted to a consumer or evaluator role while government is the sole producer. Public officials need only be responsive to demands conveyed during the beginning or end stages of a program. However, the coproduction model entails a different approach in that citizens are not merely consumers or evaluators, but rather they have a "conjoint responsibility" in producing services together with public agencies (Sharp 1980: 111). Since citizens are actively involved in delivering services, public officials must be willing to work with citizens and develop coproduction initiatives.[2]

In line with a broader definition of coproduction, this chapter centers on volunteers as citizen coproducers and explores collective coproduction where citizens are involved in a more formal and institutionalized capacity. While citizens do not necessarily have to join an organization, scholars have noted how participating in an organizational capacity has the potential to enhance coproduction levels and better facilitate coordination between public organizations and the broader citizenry (Pestoff 2014).

Moving to the research questions, the assumption offered by Brudney and England (1983) is that coproductive activities occur on a collective level, meaning that the benefits are also of collective scale. The question becomes, how to incentivize citizens to coproduce on a collective scale? From a public administration perspective, what is the role of public agencies? What kinds of formal government initiatives can encourage citizens to coproduce? What types of benefits are produced? Do coproduction initiatives have any impact on organizational

[2] Here, coproduction assumes a strict definition where public officials engage with lay citizens to coproduce public services. There are other forms of involvement such as interest group activities or public-private partnerships that constitute different service production mechanisms. There are excluded from the discussion of coproduction, as these constitute different streams of research. See, for instance, Robbins (2010) on interest group behavior in policy implementation and Kort and Klijn (2011) on public-private partnerships.

performance? Percy (1984) discusses how the interaction of individual and household characteristics, scope of benefits produced, social conditions in the neighborhood or community, and organizational arrangements/initiatives are key factors that can stimulate or discourage coproductive behaviors. While the first three are conditions beyond the direct control of public agencies, the fourth element (organizational initiatives) is something that public agencies can plan and implement on their own to enhance interactions between citizens and service agencies or to stimulate citizens to become better involved in producing services. The next section examines the LEMAS survey which contains information about two formal measures that allow for an empirical analysis of citizen participation in law enforcement duties. This survey is used to model two empirical research designs, first, to determine the factors that influence law enforcement agencies to adopt coproduction initiatives, and second, to assess the impact of coproduction on performance. The third and final section uses an international dataset to develop a research design for exploring why citizens coproduce in law enforcement.

Data: The LEMAS Survey

This section discusses the significance of the LEMAS survey used to set up the research questions for the first and second empirical chapters. Since 1987, the DOJ Bureau of Justice Statistics (BJS) has been collecting data on a variety of police management activities through the LEMAS survey.[3] A description of the survey is as follows. According to the Bureau of Justice Statistics website, this survey collects data "from over 3,000 general purpose state and local law enforcement agencies, including all those that employ 100 or more sworn officers and a nationally representative sample of smaller agencies." The survey provides information on

[3] Questions on community policing began to be included in 1997.

agency responsibilities, operating expenditures, job functions of sworn and civilian employees, officer salaries and special pay, demographic characteristics of officers, weapons and armor policies, education and training requirements, computers and information systems, vehicles, special units, and community policing activities.

Two possible measures from the survey can be used to tap into coproduction. The first pertains to a Community Policing initiative. For instance, the 2013 LEMAS survey contains two questions (E5 and E6) that ask about collaboration or partnerships with citizens or external entities (Table 1). However, this is a somewhat imperfect measure of coproduction as they lack information about direct citizen input into coproduction. Rather, they resemble networking activities (O'Toole 2015). The second measure of coproduction is the number of Reserve/Auxiliary Personnel employed by each agency, and is defined as "trained civilians who volunteer their time to conduct law enforcement duties for the agency." For the purpose of this dissertation, the number of reserve/auxiliary personnel is selected, as this provides a more direct way of measuring citizen participation in law enforcement duties.

The LEMAS survey is important in advancing coproduction theory for the following three reasons. First, it allows us to empirically observe coproduction on a formal and collective scale. As discussed before, coproduction requires the joint efforts of both regular producers and citizen/client/consumer producers in the delivery of services. Despite the fact that service production is impossible without citizen input, much of the activities which the literature uses to depict coproduction such as reporting crime, placing garbage on curbsides, customers writing postcodes in a certain way on envelopes, or tenants complying with certain norms of behavior (Alford 1998) can described as "little more than the behavior expected of citizens in an urban society" (Warren et al. 1982: 42). From a broad perspective, almost every (positive) action by

citizens can be considered coproduction. These types of citizen input to public service production are unpredictable since they are not under the direct control of government (Jakobsen 2013), and therefore coproduction becomes difficult to measure. However, if formal government programs such as community policing or use of reserve/auxiliary personnel are implemented, then it becomes easier to measure active and collaborative forms of coproduction.

Nonetheless, if we allow for a broad interpretation of coproduction and utilize the questions from Table 1 to explore coproduction, it can address a possible methodological issue. As argued before, coproduction and community policing have different origins. The former was suggested as an alternative to existing service delivery mechanisms to address fiscal challenges and improve service effectiveness, while the latter arose out of broader policing reforms. The commonality is that community policing contains programs that emphasize the active engagement of citizens in coproducing public safety. However, while the allocation of federal grants to law enforcement agencies across the nation contributed to the initial widespread diffusion of this program, one issue is the uncertainty as to whether agencies adopted this policy based on true fiscal need or as a way to receive surplus operating funds regardless of fiscal need. One might raise the argument that while the former requires funds to maintain current service levels, the latter already has enough resources to provide service at existing levels and therefore surplus funds may be used for purposes other than community policing. Fortunately, the COPS Office mandates a number of requirements for receiving federal funds such as hiring new police officers specifically for the purpose of engaging in community policing activities or establishing collaborative partnerships with local groups (Congressional Research Service 2011). In other words, coproduction is an obligation regardless of whether the agency has the willingness to

utilize coproductive arrangements or not.[4] It acts as an exogenous shock (treatment effect) so that it provides funds to those in fiscal need, while it mandates coproduction on those who may not have been driven by fiscal need.[5]

A third advantage of being government-initiated concerns a conceptual dimension. There is a difference between using citizens to replace existing public employees and using citizens as supplements. Parks et al. (1981) discuss how a *substitutive* production relationship entails a setup where regular producer inputs can be replaced by consumer producer inputs. Meanwhile, an i*nterdependent* production requires input from both regular and consumer producers to derive outputs. The exact production relationship will vary because it might may be possible to deliver some service using only citizens, while in other areas they can only be additions to existing formal employees. The adopt-a-highway program is an example of a substitutive service where municipalities involve the community in local roadside clean-up efforts. It is possible to produce this service using only citizens without having to hire any public employees.[6] However, public safety is something where coproduction cannot occur if citizens are *substitutive* of formal police forces. Theoretically, citizens have the capacity to protect their homes in the absence of regular police inputs. They can purchase firearms, self-organize citizen patrols, and engage in crime prevention. However, in practice if the legal use of force is a legitimate government monopoly, then citizens exclusively providing for public safety becomes a problem of public failure (Bozeman 2002). Therefore, coproduction of public safety cannot be a *substitutive* good. As long

[4] Here, the term "coproduction" includes a variety of activities that involve citizens in law enforcement duties, not just reserve/auxiliary personnel.
[5] However, scholars have commented on the difficulty of evaluating the actual implementation of community policing (Greene 2004; Mastrofski 2006; Mastrofski et al. 2007; Morash and Ford 2002; Thurman and Zhao 2004). Therefore, implementation is the subject of other research such as Policy/Program Evaluation. The Commission on Accreditation for Law-Enforcement Agencies (CALEA) reports are one example of efforts to evaluate the practices of law enforcement (McCabe and Fajardo 2001).
[6] This excludes employees who manage or supervise the program.

as the government claims a legitimate monopoly over the use of force, it is not possible to allow citizens to solely maintain public safety. Therefore, coproduction has to be an *interdependent* good from a public value standpoint. Table 2 presents a continuum of service delivery arrangements within public safety. If there is only input from citizens and no input by police, then what results is self-organized delivery mechanisms such as mobile patrols or vigilante groups, leading to the potential for public value failure. Although in practice service delivery arrangements might be a combination of several inputs, full coproduction of public safety can only occur when there is input from both police and citizens.

In light of these advantages that the LEMAS survey provides, the following sections outline the research design to examine two research questions. First, what are the factors that influence law enforcement agencies to adopt coproduction initiatives? Second, what are the impacts of such initiatives on organizational outcomes?

Analysis of the Determinants of Coproduction

Chapter four consists of the first empirical essay which explores the factors that influence law enforcement agencies to adopt coproduction programs using a demand/supply model. Since the early phases of coproduction research, scholars have explored different frameworks and theories such as demand/supply models and institutional theory (Kiser 1984; Parks et al. 1981; Ostrom 1996), top-down versus bottom-up models (Sharp 1980), and models regarding civil society (Verschuere et al. 2012), to provide a systematic explanation of the importance of employing coproduction as an alternative service delivery mechanism. Among these, the demand/supply model is an economic argument that relies on theories of market and government failure to explain why either purely markets or governments are not sufficient to deliver a service

(Kiser and Percy 1980; Ostrom 1996; Parks et al. 1981). For example, local governments (regular producers) are likely to adopt coproduction if some need gives rise to the use of alternative service mechanisms such as coproduction, while at the same time citizens are willing to supply their time and resources. Concerning the coproduction of law enforcement, from the demand side there must be a need for agencies to incorporate citizens in coproducing public safety, while on the supply side citizens must be willing to participate in the production of public safety.

Ferris (1988) uses this demand/supply model to examine the use of volunteers by local governments. The argument behind the use of volunteers is that it either reduces the amount of public resources committed to delivering a service or increases the level of service produced with a given amount of public resources. For instance, fiscal stress is one type of demand that provides an incentive for public agencies to utilize volunteers, as they represent an inexpensive form of labor. Modifying this model and borrowing from a number of nonprofit theories, this analysis uses the proportion of reserve/auxiliary personnel from the 2007 LEMAS survey as the measure of coproduction and incorporates variables from a number of different datasets to explore the determinants of utilizing volunteers by law enforcement agencies. In terms of the estimation method, a logistic regression is used to determine the likelihood of whether agencies utilize reserve/auxiliary personnel or not, while a Tobit decomposition is used to measure the degree to which reserve/auxiliary personnel are used by agencies.

Analysis of the Impact of Coproduction on Performance

Chapter five conducts the second empirical analysis of estimating the impact of coproduction on police performance. Measuring the effects of public management on

organizational performance has constituted one of the major research agendas for public administration (Moynihan and Pandey 2010; O'Toole and Meier 2014; Poister et al. 2013). Since coproduction is an alternative to both traditional and market-based management strategies, measuring the effects of coproduction on outcomes such as efficiency, service quality, productivity, and accountability is an important strand of research (Brudney 1983; Brudney 1984; Bovaird and Loeffler 2012; Verschuere et al. 2012). One proposition that Percy (1984: 435) sets forth is that "citizen coproduction is positively associated with higher levels of urban services provided in the community." Which type of outcome to evaluate, however, is subject to debate depending on the evaluation criteria. For instance, police agencies may generally focus on measures such as crime or victimization rates. Citizens will be more subjective in the way they evaluate outcomes because of their differing perceptions about local conditions such as decrease in fear of crime, higher housing prices, visibility of patrol cars in neighborhoods, and etc. Thus, others may consider citizen satisfaction surveys as an important indicator of performance.

This chapter adopts clearance rates as the measure of performance, and uses a set of managerial activities from the 2013 LEMAS survey to analyze the effects of coproduction on clearance rates.[7] The research design is modeled upon a prior study by Nicholson-Crotty and O'Toole (2004) who used the 1997 and 1999 LEMAS survey to measure the effects of internal and external management on clearance rates. While replicating the study carried out by Nicholson-Crotty and O'Toole using more recent data, this chapter incorporates an additional environmental variable, the proportion of reserve/auxiliary personnel employed by each police agency, in order to examine the impact of coproduction on performance. The analysis uses an

[7] For the 2013 edition, a total sample of 2,822 agencies responded to the questionnaire for a response rate of 86%. Final database includes responses from 2,059 local police departments, 717 sheriffs' offices, and 46 state law enforcement agencies.

OLS regression estimation to derive the magnitude of the effects of each management category. In addition to exploring the replication aspects from the prior study, this analysis provides an additional contribution to the literature by measuring the effects of coproduction on performance. The broader implication is the expansion of our understanding of how government-initiated coproduction in a large-N setting influences organizational performance.

Analysis of Citizen Motivations to Coproduce

Finally, chapter six contains the third empirical analysis, examination of the factors that motivate citizens to engage in coproduction (Alford 2002; Verschuere 2012). This chapter analyzes an international survey data of local residents' participation in Voluntary Citizen Patrols (citizen patrol) in the country of South Korea. The reason for this shift in empirical setting is the lack of parallel U.S. data on citizen co-production in law enforcement compatible with the LEMAS survey. For instance, the Current Population Survey (CPS) Volunteer Supplement asks citizens about whether they volunteer in public safety organizations and the number of hours they volunteer. However, the unit of analysis consists of "individuals within housing units," whereas the LEMAS survey is at the agency level.

The data for this study comes from the *Survey of Local Resident Participation in Citizen Patrol Units* administered by the Korean Institute of Criminology, and is available from the Korean Social Science Data Archives (KOSSDA).[8] This is a one-time cross-sectional survey conducted in 2005 that was originally part of a government report by Chun (2005). The survey contains questions about the status of citizens' participation in local voluntary patrol units, namely, the reasons for volunteering, types of activities they engage in, and information about

[8] http://www.kossda.or.kr/eng/index_kossda.asp

their roles within the citizen patrol units. Demographic information includes gender, age, level of education, marital status, number of children, income, type of residence, type of neighborhood, length of residence, and occupation. Using this survey, this chapter conducts an empirical investigation of the correlates of coproduction including demographic factors, community characteristics, performance perceptions, and self-efficacy. The survey was administered in the city of Seoul, and the unit of analysis is at the individual level. Respondents' characteristics consist of citizens who are members of citizen patrol units. These units are formally registered under each police department. Respondents were randomly selected among the 31 police departments within Seoul, resulting in a sample size of n=450.[9] Data was collected through interviews in which respondents were asked to fill out the survey.

The estimation method uses an ordered logistic regression as the dependent variable which consists of a question that asks respondents about the degree of participation. Specifically, it measures the frequency of engaging in patrol activities on average, and response categories include: *less than once a month, once a month, once every 15 days, once a week, twice a week, and every day (*coded from 1= *less than once a month* to 6= *every day).* The independent variables are selected from questions that garner information about the following motivational categories: intrinsic (interest, self-esteem), social or solidary (sense of group membership), normative or expressive (broader values like participation and altruism), extrinsic (safer neighborhood), self-efficacy (belief that one's actions can have an impact), satisfaction with government performance, and salience (community conditions). Capacity is generally reflected in the control variables.

[9] Methodology section did not include information on response rate.

Summary

In sum, this chapter outlines the research design by defining the concept of coproduction. Afterwards, it discusses the significance of the empirical datasets for coproduction research, and explores each of the research questions for the subsequent empirical essays. The subsequent chapters proceed to engage in detailed empirical analysis of each research question.

Figure 1. Service Production Arrangement: Traditional vs. Coproduction

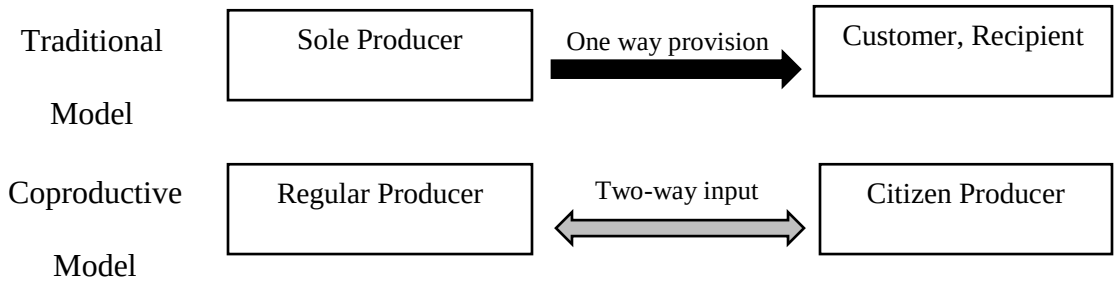
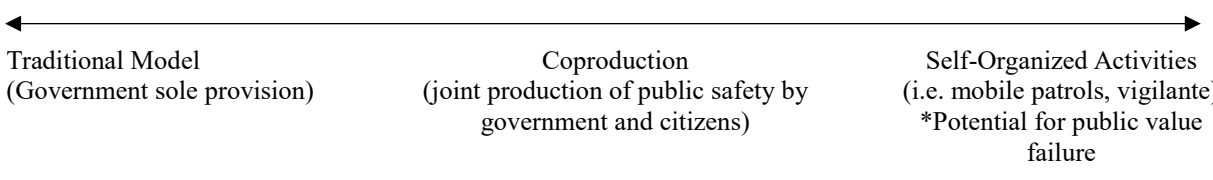


Table 1. LEMAS Survey: Section E – Community Policing

E1.	What best describes your agency's WRITTEN MISSION STATEMENT? (None, W/O CP)
E2.	What proportion of FULL-TIME SWORN PERSONNEL received at least 8 HOURS of training on COMMUNITY POLICING issues (e.g., problem solving, SARA, community partnerships)?
E3.	Did your agency actively encourage PATROL OFFICERS to engage in SARA-TYPE PROBLEM-SOLVING PROJECTS?
E4.	How many PATROL OFFICERS were engaged in SARATYPE PROBLEM-SOLVING PROJECTS? If none, enter '0'.
E5.	Did your agency include COLLABORATIVE PROBLEM-SOLVING PROJECTS in the evaluation criteria of PATROL OFFICERS?
E6.	Did your agency have a PROBLEM-SOLVING PARTNERSHIP or WRITTEN AGREEMENT with any local civic, business, or governmental organizations? This could include Memoranda of Understanding.
E7.	Did your agency regularly assign the SAME patrol officers' primary responsibility for a particular AREA OR BEAT within your agency's jurisdiction?
E8.	How MANY patrol officers were regularly given primary or exclusive responsibility for particular AREAS OR BEATS? If none, enter '0.'
E9.	During the 12-month period ending December 31, 2012, did your agency utilize information from a SURVEY OF LOCAL RESIDENTS about crime, fear of crime, or satisfaction with law enforcement?

Figure 2. Public Safety Provision Continuum



CHAPTER 4

ESSAY 1: DETERMINANTS OF COPRODUCTION

Introduction

Despite the increasing momentum towards building a more diverse and robust evidence base, few studies have systematically investigated coproduction arrangements in large, representative samples of public organizations. While there have been efforts to address certain theoretical gaps by empirically exploring why citizens coproduce (Van Eijk and Steen 2016; Paarlberg and Gen 2009), how government initiatives lead to increased citizen coproduction (Jakobsen 2013; Jakobsen and Andersen 2013; Riccucci, Van Ryzin, and Li 2015), or the effects of coproduction (Hong 2016a), there is little information about why do public agencies decide to adopt coproductive arrangements. While there is a growing literature on citizens' motivation to coproduce, there is less inquiry into the factors that influence public organizations to coproduce with citizens. Aside from a few studies (see, i.e. Brudney and Kellough 2000; Ferris 1988), little is known about the underlying factors that influence the extent to which public agencies come to involve citizens in coproducing public services.

To address this research gap, this chapter borrows theories from the nonprofit literature to examine factors that influence the adoption of coproduction in public agencies. In addition, the analysis adds an additional set of measures that highlights the role of public managers and organizational activities. This chapter derives the empirical evidence from a law enforcement survey administered to a national sample of more than 3,000 law enforcement agencies across the United States in 2007. Law enforcement represents a highly salient realm for exploring

coproduction processes for several reasons. First, public safety and security have been widely cited as a prime example of active citizen involvement in public service delivery by early coproduction scholars (Levine 1984: Kiser and Percy 1980; Ostrom and Parks 1973; Ostrom and Whitaker 1973; Percy 1978; Percy 1987; Rosentraub and Harlow 1983; Schneider 1987; Wilson 1981). Also, police organizations represent the second most common type of bureaucratic institution next to public education within the United States, and therefore constitute fertile grounds for empirical analysis. Finally, the recent tensions between police and minority groups highlight the importance of involving underrepresented citizens in the context of coproducing police services. The operational measure of coproduction for the analysis is the number of reserve-auxiliary personnel employed by each agency. According to the survey, reserve-auxiliary personnel is defined as "trained civilians who volunteer their time to conduct law enforcement duties for the agency." Since volunteering is a type of coproductive activity (Alford 2002; Brudney 1989, 1993), the survey is relevant for exploring the adoption of coproduction arrangements. Preliminary findings indicate that several managerial variables as well as demand heterogeneity and market factors affect the adoption of coproduction in different ways. Also, the findings question prior notions about the association of lower budgetary costs and coproduction, as well as highlighting certain implications for equity.

This chapter is organized as follows. The next section provides an overview of coproduction, followed by a literature review of studies on nonprofit density. The next section covers the hypotheses along with an explanation of the data and methods. The chapter then presents the results and discusses the management and policy implications for public organizations.

Prior Research

Coproduction is distinct from the traditional production mode where government is the sole provider of goods and services. It is also different from strictly market-based models such as privatization and contracting out (Alford 1998; Ostrom 1996). Scholars have offered different definitions of coproduction (i.e. Bovaird 2007; Ostrom 1996; Parks et al. 1981) and these variations entail different types of relationships and activities among service providers and users. For instance, some have identified activities such as co-planning, co-design, co-financing, co-managing, co-delivery and co-assessment as different approaches to coproduction (Bovaird and Loeffler 2012). However, such a broad interpretation leads to the concept being indistinguishable from participation in a general sense. Therefore, coproduction from a narrower view limits citizen participation to the production or delivery phases of a program (Parks et al. 1981; Sharp 1980). This enables more systematic research as it better demarcates the boundaries of the relevant actors and activities involved. For the purposes of this study, this chapter uses the definition by Brandsen and Honingh (2015: 5) who define coproduction as the "relationship between a paid employee of an organization and (groups of) individual citizens that requires a direct and active contribution from these citizens to the work of the organization."

One important question pertains to the underlying factors that influence government agencies to adopt coproduction initiatives. While some have discussed the merits of adopting coproduction from political and economic standpoints (Marschall 2004; Aligica and Tarko 2013), systematic investigation of such factors is still limited. Among prior studies, Ferris (1988) examines the demand and supply factors that influence the extent to which local governments come to rely on voluntary efforts in public service production. Brudney and Kellough (2000)

explore characteristics of volunteer usage by state governments, and Paarlberg and Gen (2009) examine the determinants of nonprofit coproduction in public education.

Meanwhile, there is a substantial body of empirical work in the nonprofit literature examining the growth of alternative service delivery arrangements. Salamon and Anheier (1998) conduct a cross-national comparison of eight developed nations to test five existing theories to determine what influences patterns of nonprofit development. They develop a new theoretical approach called the "social origins" approach which focuses on the broader social, political, and economic relationships underlying the development of the third sector. Later the authors expand their sample size to 40 countries to further test their social origins theory (Salamon, Sokolowski, and Anheier 2000). Corbin (1999) examines 285 metropolitan areas and employs measures from theories such as social cohesion, demand heterogeneity, market failure, resource dependence, and philanthropic culture. Gronbjerg and Paarlberg (2001) explore data within the state of Indiana to determine how demand, supply, and social structure predict the overall density of nonprofits in local communities. Matsunaga and Yamauchi (2004) use U.S. state-level panel data to test government failure theory, and their results find a basis for government failure. Saxton and Benson (2005) employ social capital theory, while Luksetich (2008) focuses on interdependence theory. Meanwhile, Paarlberg and Gen (2009) find conflicting results for the role of demand heterogeneity and the supply of community resources. The former points to the lack of community resources to fulfill unmet demands for public services, whereas the latter implies the need for participants to possess greater resources to self-organize. Lecy and Van Slyke (2012) conduct a joint test of both government failure theory and interdependence theory, finding support for the latter in explaining nonprofit sector growth and density. Finally, Paarlberg and Yoshioka (2016) explore the direct and indirect impact of local economic structure on

community philanthropy and discuss how these two are mediated by human resources and social capital.

On the one hand, many nonprofit organizations are in a contractual relationship with the government, meaning that the service is not a joint production between government and the nonprofit entity. This may limit the extent to which nonprofit theories are applicable to examining coproduction. However, the commonality between nonprofit organizations and coproduction is that they represent an alternative to traditional or market-based service delivery arrangements (Levine 1984). This may shed light on the basis for why governments would resort to the volunteers as well. Also, the motivations for volunteering in nonprofit organizations are similar to those who volunteer in public services, although they may not strictly overlap (Alford 2002; 2009). Therefore, the theories and concepts used in these empirical studies provide an avenue to explore the adoption of coproduction arrangements as well.

Why Coproduce? Hypotheses of Demand and Supply

Among the theories that have been used to explore nonprofit density, government failure theory, interdependence theory, market failure, social capital, and social cohesion are used to develop a model of coproduction. One key element, however, that was missing from prior studies is the role of public managers. While interdependence theory indicates a proactive governmental role in the provision of funding and subsidies to nonprofit organizations (Salamon 1987), there is a need for more specific measures that tap into the role of managers and organizational activities. Based on prior literature exploring the adoption of coproduction (i.e. Ferris 1988), this section models the demand and supply factors that influence the adoption of coproductive arrangements. Derived from economics, a demand and supply framework provides an understanding of how

markets operate and how the forces of demand and supply work together to produce market equilibrium (Mankiw 2012). For this chapter, the market consists of the variety of alternative service arrangements that can substitute the traditional mode of service production. Government is the entity in need of volunteers and therefore consists of the potential buyer. The demand side represents the factors that influence the willingness of public organizations to utilize volunteers in coproducing public services. Meanwhile, it is not enough for only public agencies to have a desire to adopt coproductive arrangements. There must be a pool of sellers who are willing to supply their time and resources to volunteer, and these consist of citizens who participate in public sector activities. The supply side depicts the factors that influence the willingness and ability on the part of citizens to volunteer in public sector activities, and it is here that several of the prior nonprofit theories are explored to derive measures of supply.

For the empirical data, the variable of interest concerns the use of volunteer police officers in law enforcement duties. Otherwise known as reserve/auxiliary personnel, volunteer officers are defined as "trained civilians who volunteer their time to conduct law enforcement duties for the agency" (U.S. Department of Justice 2013b: B4). While these are sworn positions endowed with law enforcement authority, a key feature is that they volunteer on an unpaid basis.[10] On the one hand, the criminal justice literature discusses the concept of "civilianization" which centers on resorting to alternative manpower resources to reduce costs and improve services. However, while early studies include volunteers in this labor pool (Berg and Doerner 1988; Greenberg 1979), more recent studies refer to civilianization as the use of non-sworn paid civilians generally employed in specialized positions in communications, forensics, computer specialists, and other support functions (Alderden and Skogan 2012; Forst 2000; Maguire et al.

[10] In some jurisdictions, volunteer police may refer to part-time paid positions, which is beyond the scope of this chapter. See Dobrin and Wolf (2016) for a comprehensive review on volunteer police officers.

2003). Therefore, conceptually, volunteer officers match the description of prior studies on collective coproduction programs that incorporate “large numbers of citizen volunteers into the service bureaucracy as part of the regular public workforce” and are “matched with a set of work activities in service agencies for which they are trained or otherwise judged competent” (Brudney 1984: 475).

Demand Factors

One factor identified by the public administration literature is the form of government. The literature argues that council-manager governments are more professional and perform better than other institutional structures such as mayor-council forms (Carr 2015; Choi, Feiock, and Bae 2013; Ferris 1988; Lineberry and Fowler 1967; Sharp 1991; Wikstrom 1979). Since council-managers are appointed by the legislative body, this renders them less likely to be burdened by partisan interests and so they are more likely to involve residents in deciding policies and programs of public importance. In terms of functionality, council-managers are likely to run organizations more efficiently and to adopt innovative policies and practices. Since the heads of law enforcement agencies are public employees owing allegiance to the broader jurisdiction, it is assumed that police agencies will be influenced by the institutional setting of their respective jurisdictions. The hypothesis is that police agencies located under council-manager forms of government will be more likely to adopt voluntary arrangements.

Second, fiscal constraints can prompt agencies to consider using volunteers since they represent an inexpensive form of labor (Brudney 1983; Parks et al. 1981; Percy 1984). Government failure theory argues that public agencies lack the capacity to address increasing service demands. Jurisdictions with increasing demands for services but faced with budget constraints will seek to benefit from the use of volunteers. For example, agencies could use

volunteers for more peripheral tasks, whereas resources can be used to enable formal personnel to devote more time to core policing activities. In addition, some agencies such as the New York Police Department's Auxiliary Police Program use volunteers to conduct formal duties such as uniformed patrol and crime prevention, although they are unarmed and do not possess formal law enforcement authorities (Wolf, Albrecht, and Dobrin 2015). Thus, agencies located in jurisdictions facing greater fiscal constraints will be more likely to adopt coproduction initiatives.

Meanwhile, volunteer programs are not absolutely costless. Scholars have noted how volunteer programs may require additional resources for activities such as recruitment, supervision and liability protection (Brudney 1990; Brudney and Kellough 2000). In fact, larger organizations possess greater resources while having greater service demands, meaning they possess both the need as well as capability to use volunteers. This is indicative of interdependence theory which argues for a collaborative relationship between public agencies and secondary providers such as nonprofits. In the context of coproduction, police agencies come to recognize the benefit of volunteers in assisting in law enforcement duties, and therefore, agencies with greater resources would be more likely to utilize coproduction (Salamon 1987). The hypothesis is that an increase in government support such as greater funding will be associated with a greater likelihood of adopting coproduction. However, since there is a conflict between fiscal constraints and greater resources on the use of volunteers, the expected sign of the coefficient is indeterminate.

Third, it is assumed that unions will be more prone to resist the use of volunteers as this threatens their job security and wages (Brudney and Kellough 2000). Of course, it is possible for formal employees to view volunteers as complements, and scholars have offered possible

suggestions to reduce opposition from paid employees (Macduff 1997; McCurley and Lynch 1996). However, some law enforcement studies argue that reform efforts to expand the use of volunteers during the 1990s were thwarted due to opposition from police unions and associations, and in some jurisdictions these efforts were strongly restricted by judicial decisions (Wolf, Albrecht, and Dobrin 2015). Union opposition could be amplified by the more hierarchical and stable internal organizational structures of law enforcement agencies. Therefore, the hypothesis is that greater union strength will lead to less prevalence of the use of volunteers.

Fourth, Community-Oriented Policing became a federal grant program through the enactment of the Violent Crime Control and Law Enforcement Act of 1994. One the one hand, community policing is not necessarily focused on efficiency and performance, but rather the program's emphasis is on forging partnerships and building relationships between police agencies and communities (Robin 2000; U.S. Department of Justice 1994). In fact, studies have found mixed results concerning community policing and performance (Evans and Owens 2007; Lilley and Boba 2008; Nicholson-Crotty and O'Toole 2004; Worrall 2008; Worrall and Kovandzic 2006, 2010; Zhao et al. 2003). However, if community policing is the end goal, then the program can be expected to generate conditions in the community that are favorable in prompting citizens to coproduce. In turn, citizen coproduction can assist in achieving organizational goals. Therefore, community policing is included in the model because it represents a type of managerial demand imposed on police agencies, and the hypothesis is that agencies that have implemented community policing programs will be associated with a greater prevalence of coproduction.[11]

[11] This is not to infer any causal direction because of endogeneity: community policing can encourage citizens to coproduce, but coproduction can also enable better community policing. From the 2007 LEMAS survey, out of the 2,875 respondents, only 235 (8%) answered that they used volunteers without any community policing activities in place, while 1,252 (43%) stated that they both used volunteers and implemented community policing programs.

Finally, the debate within representative bureaucracy about how to increase employment of underrepresented racial minorities in public bureaucracies has persisted for some time (i.e. Lewis 1989; Meier, Pennington and Eller 2005; Romzek and Hendricks 1982; Wilkins and Williams 2008). However, the tensions between police and minorities, especially in African American communities, have garnered increasing media attention in recent years and have been a salient reminder of the need for greater police representation and diversity (Hong 2016b). In addition to active and passive representation, a recent strand of research exploring the concept of symbolic representation argues that the social origins of a bureaucrat can generate a sense of trust and legitimacy among citizens who share those social origins, leading to subsequent cooperation from minority citizens (Riccucci and Van Ryzin 2016; Theobald and Haider-Markel 2009). Applying this to coproduction, the argument is that managerial efforts to expand minority representation within police organizations can convey a positive signal to minority communities, leading to greater trust and legitimacy of law enforcement. This in turn could elicit greater cooperation and coproduction from minority citizens. To measure representation, this chapter includes a measure of the percentage of full-time minority officers to the percentage of minorities in the jurisdiction. A ratio of "one" indicates that there is greater equality between the community and police in terms of racial representation. Greater minority representation will be positively associated with greater prevalence of coproduction.

Supply Factors

Proceeding to the supply side, several theories of nonprofit density relevant for analyzing the prevalence of coproduction are explored below. First, government failure theory has been used for studying both nonprofits as well as coproduction (Weisbrod 1977; 1991; Parks et al. 1981;

Ferris 1988; Young 2000).[12] The underlying notion is that the services which a government provides are generally in line with the preferences of median voters in a community. However, when a society becomes more diverse or heterogeneous, government provision becomes insufficient to satisfy the demand of minority groups for different services. Thus, secondary markets develop in order to satisfy various demands. Such heterogeneous preferences give rise to alternative service delivery mechanisms such as for-profit or nonprofit organizations. However, due to market inefficiencies arising from the discrepancy between cost and revenue, namely due to the absence of a price mechanism associated with producing public services (Le Grand 1991), the alternative is to turn to nonprofit organizations which are more aligned with the public interest. Applying this notion to coproduction, conditions begin to form in which governments realize the benefit of enlisting volunteers and in which citizens become more willing to coproduce in public services (Ferris 1988). Variables reflective of heterogeneous preferences include community wealth, racial diversity and unemployment. The hypothesis is that heterogeneous demands will be positively associated with greater prevalence of the use of voluntary arrangements. This is operationalized by the median value of owner-occupied housing in thousands of dollars, the percentage of the jurisdiction's minority population, and the county's unemployment rate. However, because governments in high-wealth and low-wealth communities are expected to provide services that satisfy a majority of their constituents, less volunteering is expected in such communities compared to moderate wealth communities. Therefore, a nonlinear relationship is expected between community wealth and coproduction. The same argument

[12] Lecy and Van Slyke (2012) argue that government failure theory no longer reflects the current state of public administration research. They discuss how instead of government lacking the capacity to provide services, rather it is citizens who demand market-based solutions that involve decentralized governance and networked arrangements. In turn, government decides whether to continue to alternative mechanisms for direct provision or use third parties to produce and deliver services.

applies to racial mix so that jurisdictions with moderate size minorities are expected to have a higher likelihood of volunteering, while a negative relationship is expected in communities with very low and high proportion of minorities.

Meanwhile, social capital refers to the norms of reciprocity and trust engendered through networks of civic engagement that lead to higher levels of trust, coordination and communication (Putnam 1993). A related concept is social cohesion which refers to "the total field of forces which act on members to remain in the group" (Festinger, Schachter, and Back: 1963:164). Corbin (1999) describes social cohesion as both a result of prior group attitudes and as a characteristic feature that leads to successful group formation and performance. Social capital and social cohesion are reflective of homogeneous demands which arise from groups sharing similar characteristics and values. Examples of such measures include engagement in public affairs, community volunteerism, participation in organizations, informal social ties, and social trust (Putnam 2001). Saxton and Benson (2005: 24) add to this list by including a "bridging" aspect which measures the diversity of social networks. Due to data availability, this chapter uses related measures such as median household income and the percentage of the jurisdiction's households who are homeowners. While not direct measures of social capital, they indirectly reflect a sense of community in that jurisdictions with large numbers of homeowners or households with similar income levels are more likely to be stable and cohesive, have higher levels of local ties, and retain a greater sense of attachment (Kasarda and Janowitz 1974; Sampson 1988). Also, studies on political participation and volunteering show that individuals with higher SES tend to be more active in political and social life (Musick and Wilson 2008; Verba and Nie 1987; Verba et al. 1995). Meanwhile, individuals of higher socioeconomic status possess greater resources in terms of financial capacity, information and greater access to

institutions and activities for participation, which are factors that lead to higher levels of involvement in political and community affairs and volunteerism (Musick and Wilson 2008; Rogers et al. 1975). Therefore, the hypothesis is that high levels of social cohesion measured through the median household income and percentage of homeownership will be positively associated with greater prevalence of the use of coproductive arrangements.

Scholars have also found age to influence patterns of volunteering in public services. Several studies have found that older people are more likely to participate due to greater time and resources for doing so (Brady et al. 1995; Dalton 2008; Musick and Wilson 2008; Nabatchi 2010; Taniguchi 2012). However, different age groups are affected in different ways ranging from considerations of time and money to individual capacities such as personal values, education levels or time spent working. In addition, it is necessary to note that volunteers who participate in law enforcement duties may be different from those who volunteer in other service areas (Hilal and Olson 2010). For instance, Wolf, Albrecht, and Dobrin (2015) describe three underlying bases that individuals might volunteer as reserve/auxiliary officers. First, citizens volunteer for general reasons such as having a desire to serve their community, and law enforcement is one of those outlets. This subset may consist of individuals of all ages. A second subset consists of those who volunteer to gain the training and experience prior to applying for full-time positions as police officers, and this age range consist of individuals who are in their 20s and 30s. The final subset consists of personnel who have retired from full-time duties but who continue to donate their time to public safety activities. These individuals are generally between their 40s and 50s. Due to these variations, the expected signs of the age coefficients are indeterminate.

Finally, population and crime rate are included as controls. While population can be interpreted in many ways, Ferris (1988) argues how jurisdictions with small populations are more likely to be cohesive and so residents would be more likely to volunteer. As populations become larger however, they are more likely to be fragmented and so the level of social cohesion decreases, leading to subsequent decrease in volunteering. However, jurisdictions with even larger populations are prone to be more diverse and have more unsatisfied demands, reversing the momentum and becoming more likely to coproduce in public services. Therefore, a nonlinear relationship can be expected with population. Meanwhile, the crime rate is expected to function as a constraint on performance due to the increase in difficulty and complexity of the agency's core crime fighting tasks (Nichoson-Crotty and O'Toole 2004). Crime rate should have a positive association with coproduction in two ways (Rosentraub and Warren 1987). First, if volunteers are used as substitutes for certain ancillary and passive law enforcement duties, this can enable formal personnel to devote existing resources to core crime fighting activities. Second, volunteers can be a complement and assist with active core duties, as with the NYPD Auxiliary Police Program, which provides an additional resource. In either case, a higher crime rate should be associated with a greater prevalence of adopting coproductive arrangements.

Data and Measures

This chapter derives data from several sources. First, data on volunteer officers come from the 2007 Law Enforcement Management and Administrative Statistics (LEMAS) survey. The survey is sent to the heads of more than 3,000 state and local law enforcement agencies within the United States that employ one hundred or more sworn officers and a nationally representative sample of smaller agencies. The response rate for the survey is 91.8% (n=2,875).

The survey collects information about agency responsibilities, operating expenditures, job functions of sworn and civilian employees, officer salaries and special pay, demographic characteristics of officers, weapons and armor policies, education and training requirements, computers and information systems, vehicles, special units, and community policing activities. The survey defines volunteer officers (reserve/auxiliary personnel) as "trained civilians who volunteer their time to conduct law enforcement duties for the agency" (U.S. Department of Justice 2013b: B4). Data for the independent variables are collected from various sources. Supplemental data sources include the 2007 *International City Management Council: Profile of Local Govt. Service Delivery Choices*; the 2007 *County and City Databook*; the 2007 *County and City Extra: Annual Metro, City, and County Databook*; the 2007 *Federal Bureau of Investigation's Uniform Crime Report (UCR)*; and the *Union Membership and Coverage Database from the CPS* available at unionstats.com.

Measures of Demand

Coproduction. The primary dependent variable is the ratio of volunteers to the total number of paid employees in a law enforcement agency. This is measured by dividing the total number of reserve/auxiliary personnel by the total number of paid (full-time and part-time) employees, and multiplying this by 100. This is used to create a second binary dependent variable indicating whether an agency used volunteers for any type of law enforcement duty (1 = yes, 0 = no).

Form of government. The International City Management Council (ICMA) survey contains a question about whether the form of government consists of a council-manager, commission, mayor-council, representative town meeting, or town meeting. This was used to

create a dummy variable for those jurisdictions operating under a council-manager structure (1 = council-manager, 0 = otherwise).

Fiscal constraint. This is operationalized through the relative tax burden imposed upon citizens in a jurisdiction, calculated by dividing total tax revenue from local sources by the jurisdiction's population to derive tax per capita. Afterwards, tax per capita is divided by median household income to derive the tax burden.

Agency size and budget. In contrast to government failure, interdependence theory allows us to test whether coproduction is a result of a collaborative relationship between the government and citizens. To operationalize this, two measures are the size of the agency based on the total number of paid full-time personnel, and the agency's total operating budget for the 12-month period.

Union strength. Strength of public employee unions is measured using data on the percentage of public sector employees who are members of unions.

Community policing. The LEMAS survey contains a set of questions that ask agencies about community policing activities. The full set of community policing measures were factor analyzed using principal component analysis to derive a common factor. This process produced a single score (eigenvalue 5.83) that resulted in the following ten items having a loading coefficient above 0.70: (1) agency maintained a mission statement that included components of community policing; (2) agency encouraged officers to engage in SARA-type problem-solving activities; (3) agency conducted a citizen policy academy; (4) agency maintained a written, formal community policing plan; (5) officers had responsibility for specific geographic areas/beats; (6) collaborative problem-solving projects were included in the evaluation criteria of patrol officers; (7) agency upgraded technology to support the analysis of community problems;

(8) agency partnered with citizen groups and included feedback in developing neighborhood policing strategies; (9) agency sponsored a citizen survey; and (10) agency maintained a community policing unit with full-time personnel.

Minority Representation. This is measured as the percentage of full-time minority officers to the percentage of minorities in the jurisdiction. A ratio of "one" indicates that there is greater equality between the community and police in terms of racial representation.

Measures of Supply

Heterogeneous demands. Three measures of demand heterogeneity include community wealth, racial mix, and unemployment. While community wealth is operationalized by the median value of owner-occupied housing, governments in low and high-wealth communities are expected to retain more homogeneous preferences and this is measured through its square value. Racial mix is operationalized by the percentage of minorities in the county. This is also expected to display a nonlinear relationship and the square term is included to measure this. Unemployment is measured by the county unemployment rate.

Social Cohesion. Three variables selected to capture the effects of social cohesion include socioeconomic status, percentage of owner-occupied housing, and age. Socioeconomic status is operationalized using county median annual household income. However, varying income levels may affect volunteering in different ways so that very low and very high income brackets may be less prone to volunteer, while those in the middle range are more likely to volunteer. Thus, a squared value is also included. Neighborhood context is also measured by the percentage of owner-occupied housing units in a county.

Age. Age is measured as the percentage of individuals located in six different age groups ranging from between 15 and 24, 25 and 34, 35 and 44, 45 and 54, 55 and 64, and 65 to 74. The

groups 25 to 34, and 35 to 44 represents those who might be likely to volunteer for reasons of gaining training experience necessary to apply for full-time positions. The groups 55 to 64, and 65 to 74 age brackets represent those such as retirees who continue to volunteer in policing activities.

Controls. Population consists of the number of citizens in the jurisdiction in which the agency is located. As discussed before, population is assumed to have a nonlinear relationship with coproduction. Therefore, the population and its squared value are included in the model. Meanwhile, the violent crime rate is measured by dividing the total number of reported violent crimes by the jurisdiction's population and multiplying by 1,000. Increase in crime represents additional burden on organizational activities as it increases the difficulty of policing activities, and this is expected to be associated with greater prevalence of employing volunteers.

Methodology

There are two dependent variables for this analysis. The first is a binary variable that indicates whether an agency uses volunteers at all, and a Logistic regression analysis is appropriate for estimating the likelihood of volunteer use. The second dependent variable is the degree of volunteer use in terms of the share of volunteer officers to the total number of sworn employees within an agency. Rather than a linear regression, a Tobit model is appropriate since the dependent variable is continuous but is censored at zero (Orme & Buehler, 2001). That is, many law enforcement agencies do not report the use of volunteer officers at all, and among those that do there is wide variation in the extent of their use. This results in the distribution of the dependent variable being censored or having a lower bound of zero. Since the tobit coefficients are uninterpretable except for the sign, the marginal effects are reported in the results.

The Tobit model contains two underlying equations, first, the nonzero values of the dependent variable, and second, the censored values of the dependent variable (Carson & Sun, 2007). The Tobit coefficients combine these two: the effect of the independent variables on the observed non-zero values of the dependent variable, and the effect of the independent variables on the probability of observing a non-zero value of the dependent variable. Subsequently, there are three marginal effects reported in the Tobit results. First is the change in the unconditional expected value of the latent dependent variable: the use of volunteers by law enforcement agencies. Second is the change in the expected value of the dependent variable conditional on the observation being uncensored: the change in the expected percentage of volunteer use conditional upon the agency using volunteers in any law enforcement duty at all (a non-zero percentage of agencies using volunteers). The third marginal effect is the change in the probability that an observation is uncensored: the change in the probability that an agency utilized volunteers for law enforcement duties (a non-zero percentage of agencies using volunteers). McDonald and Moffitt (1980) discuss how these three marginal effects are interlinked systematically. The change in the unconditional expected value of the latent variable: (a) is equal to the sum of the expected value conditional on being uncensored; (b) weighted by the probability of being uncensored added to the probability of being uncensored; and (c) weighted by the conditional expected value. The marginal effects can be interpreted as one would in a Probit model. Also, these marginal effects for volunteering are calculated at the point of censoring (zero in volunteer use) rather than at the variable means for better interpretation.

Results

This section discusses the results of the logit and tobit models separately: the decision on whether to use volunteers at all, and to what extent should volunteers be utilized. The descriptive statistics are provided in Table 2. In the sample, 55% of police agencies utilized volunteers for law enforcement duties. The maximum ratio of volunteers to full-time sworn personnel employed by police agencies ranged from zero to 63.33% with a mean of 5.02%. Meanwhile, 75% of jurisdictions in the sample had a council-manager form of government. The mean of the tax burden for jurisdictions was 2.28, calculated as the ratio of tax per capita to median household income. Agency size as measured by the total number of paid agency personnel had a mean of 317 employees, while the mean operating budget for police agencies was $32.12 million. The mean factor score for community policing activities was 0.5, while law enforcement agencies had a mean score of 0.63 for minority representation. In terms of unionization, 33.36% of States contained public employees who were unionized. The median value of owner occupied housing as of 2000 was $131,340, the median annual household income was $52,010, and the average unemployment rate for counties was 4.67%. The percent of owner-occupied housing units was 66.61%. In terms of the minority population, on average counties consisted of 31.55% minorities. For the selected age groups, 14.53% of the population was between 15 and 24, 13.47% were between 25 and 34 years, 14.59% were between 35 and 44, 14.27% were between 45 and 54, 10.20% were between 55 and 64, and 6.29% were between 65 and 74. Finally, the mean jurisdiction population was 148,479, while the violent crime rate per 1,000 persons was 4.37. This section includes the results of two models. First is a straightforward model that

estimates the original variables without any square terms. The second model is the result of the estimates containing square terms.[13]

Likelihood of Using Volunteers

Table 3 provides the coefficients and percentage change in odds for the logistic regression results. The results of two estimations are specified in models one and two. Model one is the straightforward model that examines the linear effects of the variables, while model two includes the square terms for examining the nonlinear effects. In both models, on the demand side, form of government is statistically significant and positive ($p<0.10$ for model two), confirming the hypothesis that police agencies located in council-manager government jurisdictions are more likely to adopt volunteer arrangements. The odds ratio demonstrates that council-manager governments are more likely to utilize volunteers in law enforcement duties (-84.48%, $p<0.05$) in both model one and model two (-73.90%, $p<0.01$). Tax burden is statistically significant but negative in both models, contradicting the hypothesis that fiscal constraints are associated with greater prevalence of utilizing volunteers. The estimates reveal that jurisdictions with higher tax burden are less likely to utilize volunteers in model one (-21.96%, $p<0.05$) and in model two (-25.02%, $p<0.05$). Meanwhile, union strength is significant and negative in both models, confirming the hypothesis that it is associated with less likelihood of using volunteers. Community policing is significant and positive which confirms our initial hypothesis. The odds ratio indicates that community policing is associated with greater likelihood of using volunteers

[13] The use of square terms raises the issue of multi-collinearity which results in inflated standard errors. The VIF(variance inflation factor) for the median-value of owner occupied housing and square term is 28.58 and 18.70; percentage of minorities in the jurisdiction and its square term is 20.58 and 16.40; and median household income and its square term is 78.99 and 63.34. However, multicollinearity may not constitute a serious problem if the two variables are not correlated by chance, the two are not a linear transformation of the other, and if the variables of concern are control variables (Cameron and Trivedi 2010). Therefore, the findings are conservative estimates of the effects of the variables.

in both model one (69.57%, $p<0.01$) and in model two (68.56%, $p<0.05$). Finally, minority representation is not significant in both models.

Proceeding to the supply factors, in model one, only the variables for median value of owner-occupied housing and unemployment is statistically significant. These are two contrasting findings in that agencies are more likely to use volunteers as the wealth of a community increases, while at the same time volunteer usage is more likely to be prevalent as unemployment increases. However, in terms of the nonlinear estimations (Model 2), median value of owner-occupied housing is not significant while the squared value is significant and positive, suggesting that jurisdictions with homogeneous preferences are more likely to utilize volunteers. Racial mix in terms of the percentage of the minority population is significant for both the normal and squared term. These two coefficients confirm the hypothesis that heterogeneous preferences in terms of racial mix is associated with greater likelihood of volunteer usage. The estimates show that the odds of utilizing volunteers in moderate-sized racial communities increase by 4.58 percentage points, while communities with very low and high proportion of African Americans are less likely to utilize volunteers as observed by the decrease in the odds by 0.05 percentage points. The results for unemployment confirm the hypothesis that volunteer usage is more prevalent as unemployment increases. Meanwhile, median-household income suggests that moderate-wealth communities are more likely to utilize volunteers, whereas very low and high wealth communities are less likely to do so. Finally, among the age categories, the group from 55 to 64 is statistically significant in model two, while the population is significant and positive for both the normal and squared term.

Degree of Volunteer Usage

Table 4 provides the results for the Tobit regression coefficients and marginal effects using the ratio of volunteers to the total number of paid employees in an agency. The first marginal effect in Table 4 (ΔUEV) is the change in the expected value of coproduction (the latent variable) arrangements in law enforcement agencies. The second (ΔCEV) and third marginal effects (ΔProb) depict the change in the percentage of services with volunteer use and the change in the probability of volunteer use in any service. In model one, for the demand side, form of government, tax burden, size of agency budget, union strength, and community policing are statistically significant.

As with the logit results, form of government is statistically significant and positive, confirming the hypothesis that police agencies located in council-manager jurisdictions utilize volunteer arrangements to a greater degree. Tax burden is significant but negative which contradicts the hypothesis that agencies facing greater fiscal constraints utilize volunteers to a greater degree. The results show that a one-unit increase in tax burden scale decreases volunteer coproduction arrangements by 5.05 percentage points, and decreases the percent of services using volunteers by 10.32 percentage points (ΔProb= -13.83, $p<0.01$). For the size of the agency budget, a one-unit increase in the tax burden scale increases volunteer coproduction arrangements by 7.61 percentage points, and decreases the percentage of services using volunteers by 5.40 percentage points (ΔProb= 7.24, $p<0.01$). Union strength is significant and negative, suggesting that decrease in union strength is associated with a greater degree of volunteer usage. Community policing is significant and positive, indicating quite large effects in that an increase in community policing increases volunteer coproduction arrangements by 26.61 percentage points and increases the percentage of volunteer usage for law enforcement services by 18.89 percentage points (ΔProb=-25.31, $p<0.01$). Finally, minority representation is not

significant. The results of model two largely mirror that of model one in terms of the effect size and sign of coefficients.

Meanwhile, for the supply side factors, in model one, only the median value of owner-occupied housing, percentage of minority population, and the age group between 35 and 44 are statistically significant. For owner-occupied housing, the result is similar to the logit estimate in that as community wealth increases, police agencies use volunteers to a greater degree. For the minority population variable, a one percentage point increase in the minority population increases volunteer coproduction arrangements by 0.18 percentage points while increasing the percentage of police agencies using volunteers by 0.13 percentage points. For the 35 to 44 age group, a one percentage point increase in this scale decreases coproduction arrangements by 4.44 percentage points, and increases the percentage of services using volunteers by 3.15 percentage points ($\Delta Prob=4.22$, $p<0.10$).

For model two, the squared value for median value of owner-occupied housing, the percentage of minority population, median-household income, age group 35 to 44 and 55 to 64, and the squared value for population are significant. For minority population, the estimates show that moderate-sized racial communities utilize volunteers to a greater degree, whereas communities with very low and high proportion of African Americans utilize volunteers to a lesser degree. Unemployment continues to be significant and positive, demonstrating that a higher unemployment rate is associated with a greater degree of volunteer usage. For median household income, the results are similar to the logit results in that moderately wealthy communities utilize volunteers to a greater degree, whereas very low and high wealth communities do so to a lesser degree. In terms of the age categories, individuals between the age group 35 and 44 participate to a lesser degree, whereas individuals between the age group 55 to

64 participate to a greater degree. Finally, for population, volunteers are used to a greater degree in moderate size populations, which contradicts the hypothesis that use of volunteers in police agencies is less prevalent in moderate sized populations.

To sum, the findings provide mixed support for several of the hypotheses. Having a council-manager form of government is significantly related to the decision to utilize volunteers as well as the degree of volunteer usage. However, tax burden is significant and negative for both the logit and tobit analyses. Union strength and community policing is also significant in both the logit and tobit analyses. Meanwhile, several supply side variables such as median value of owner-occupied housing, percentage of minority population, unemployment rate, median-household income, and different age groups affect both the decision and degree of volunteer usage. Finally, population was also significant in both the logit and tobit analyses.

Discussion

The findings indicate that in terms of the likelihood of using volunteers, the form of government, fiscal constraint, union strength, community policing, community wealth, racial composition, unemployment, median household income, and population are statistically significant. In terms of the degree of volunteer usage, the form of government, tax burden, agency budget size, community policing, community wealth, racial composition, unemployment, median household income, certain age groups, and population are significant in affecting the degree of volunteer usage. These findings have important implications for public management and policy.

Foremost, on the demand side, the results show that council-manager form of government is significantly related to both the decision about whether to employ volunteers and

the degree to which volunteers should be utilized. While it is difficult to ascertain in what way this form of government directly influences the decision-making of the heads of police organizations, it might be that police agencies are influenced by the institutional setting of their respective jurisdictions. That is, local governments' decision to adopt alternative service delivery arrangements may influence law enforcement agencies' decisions to resort to using alternative manpower resources such as volunteers. Meanwhile, the tax burden is significant in both the logit and tobit analyses, but the directional effect is the opposite of what was hypothesized about the relationship between fiscal constraints and utilizing volunteers. That is, the results show that police agencies located in jurisdictions with higher tax burdens are less likely to utilize volunteers for law enforcement duties. Prior coproduction studies have suggested that one of the incentives to coproduce is to save costs (Brudney 1983; Ferris 1988; Percy 1984), meaning that the use of volunteers could lead to a net decrease in expenditures. However, scholars acknowledge how managing and coordinating volunteer programs may require additional resources (Brudney and Kellough 2000; Fisher and Cole 1993; McCurley and Lynch 1996). One may argue that jurisdictions with lower tax burdens might use volunteers to expand services without raising taxes, assuming they have smaller budgets. But since these governments have fewer resources, volunteer programs could impose a burden on organizations, resulting in less effective volunteer utilization. However, we do not know with certainty about the role of expenditures or savings without further information about the administrative costs required to recruit, train and deploy volunteer officers. This is the subject of future studies engaging in cost-benefit analyses. Meanwhile, union strength was associated with both a lower likelihood and degree of using volunteer officers. The results suggest that union opposition poses a significant

hurdle regarding the decision to utilize volunteers or not, and also the extent to which they are utilized.

Meanwhile, the significant and positive influence of community policing in both the logit and tobit analyses confirms the hypothesis that community policing should have a positive effect on coproduction by generating an environment which makes it more favorable for citizens to coproduce. Nearly 43% of agencies responded that they implemented both community policing and volunteer officer programs at the same time, and the results from the Tobit analysis indicate that agencies that implemented community policing utilize volunteers to a greater degree as well.

Moving on to the supply factors, examining the likelihood of using volunteer officers or not, the findings reveal statistically significant effects for value of owner-occupied housing, percentage of minority population, unemployment rate, median-household income, the age group between 55 to 64 and population. These findings confirm several hypotheses about the way heterogeneous preferences, community wealth, unemployment and population size influence the decision to volunteer in different ways. From the value of owner-occupied housing, communities with more homogenous preferences in terms of having higher levels of social cohesion are more likely to volunteer. However, communities with a very high or low proportion of ethnic minorities contain homogenous preferences but have lower levels of volunteering. However, within the context of police services, one must consider the history of race relations (Gabbidon and Higgins 2009; Schafer, Huebner, and Bynum 2003; Schuck, Rosenbaum and Hawkins 2008) and recall how police services tend to be less satisfactory in areas containing a high proportion of minorities (Wehrman and Angelis 2011). Low levels of service satisfaction in jurisdictions with large minorities, the fact that these communities tend to possess lower wealth and lack the human and financial capital to engage in and support voluntary activities, raise issues of equity in terms

of who coproduces and who benefits from coproduction. This is an important issue that is the subject of future research.

Meanwhile, median-household income shows that as wealth increases there are higher levels of volunteering. However, the squared value indicates that extremely low or high wealth communities have lower levels of volunteering, suggesting that individuals in such wealth brackets have higher opportunity costs of volunteering. Unemployment rate is also significant in both models, suggesting that unemployment is a significant factor that leads to greater use of volunteers.

Finally, the age group from 55 to 64 is significant and positive in both analyses, providing support for prior studies about how former police officers constitute a significant subset of individuals who tend to participate as volunteer officers (Wolf, Albrecht, and Dobrin 2015). In terms of population size, the results indicate that population size positively affects law enforcement agencies' decision to rely on volunteers. This is opposite the hypothesis that jurisdictions with small and large populations are more likely to volunteer, while moderate size communities are less likely to do so. However, as mentioned before, population could be interpreted in a variety of ways based on whether one borrows from government failure or social cohesion as an explanation. It could be that as population increases, agencies are faced with higher service demands, and police agencies begin to rely on voluntary arrangements to meet these needs.

This paper examines how demand and supply factors derived from several theories on public management, government failure, interdependence theory and social cohesion affect local law enforcement agencies' decisions to utilize volunteers for police services. The results of the logit analysis indicate that a wide variety of factors influence the decision on whether to utilize

volunteers in law enforcement, while many of these variables continue to be significant in terms of the degree of utilizing volunteer officers. Overall, this chapter enhances our understanding of coproduction by analyzing how a set of demand and supply factors affect law enforcement agencies to adopt coproductive arrangements.

One limitation of this analysis is that the service realm is limited to public safety and the results may not be readily generalized to other public service areas. However, police organizations represent the second most common type of bureaucratic institution, next to public education, within the United States, and public safety has been widely cited as a prime example of coproduction in early studies (Levine 1984: Kiser and Percy 1980; Ostrom and Parks 1973; Ostrom and Whitaker 1973; Percy 1978; Percy 1987; Rosentraub and Harlow 1983; Schneider 1987; Wilson 1981). Another limitation is that citizens who volunteer for law enforcement may be largely different from those who volunteer in other public services. As mentioned in the example of the NYPD Auxiliary Police Program, volunteers are sometimes used to conduct formal duties such as uniformed patrol and crime prevention, raising the concern about the differences between this specialized group of volunteers and other forms of general volunteering in public safety.

One important avenue for future research is the question of equity. While the minority representation variable is not significant in this analysis, jurisdictions with a large proportion of minorities tend to face higher demands for police services, and these communities also tend to score lower on indicators of human and financial capital. In such communities, the question is not whether there is a greater need for coproduction but rather how to increase coproduction among such populations. In addition, agencies should attend to the issue of increasing minority representation since studies have shown how symbolic representation can enhance trust and

legitimacy, leading to greater cooperation and coproduction from citizens. This is where public agencies could take initiatives to design coproduction programs so that disadvantaged citizens can better participate, raising the potential to generate gains in both efficiency and equity.

Table 2. Descriptive Statistics

Variables	Unit[a]	Min	Median	Mean[b]	Max	SD
Likelihood of using volunteers for law enforcement duties in 2007 (1=Yes, 0=No)	Juris.	0	1	0.55	1	0.49
Ratio of volunteers to total number of employees in agency (percentage)	Juris.	0	1.06	5.02	63.33	8.50
Council-Manager form of government (1=Yes, 0: otherwise)	Juris.	0	1.00	0.75	1.00	0.43
Ratio of tax per capita to median household income	Juris.	0.73	2.13	2.28	15.97	1.01
Total number of actual full-time paid agency employees	Juris.	4.00	139.00	317.86	4704	581.48
Total operating budget for the 12-month period as of 2007, in millions	Juris.	0.20	11.62	32.12	657.70	67.08
Implementation of community-oriented policing activities[c]	Juris.	0.00	0.5	0.5	9	0.45
Minority Representation	Juris.	0	0.49	0.63	9.48	0.97
Percentage of local public employees unionized	State	8.10	26.30	33.36	70.00	18.59
Median value of owner occupied housing as of 2000, in thousands	County	11.80	112.90	131.34	469.20	69.81
Median annual household income as of 2007, in thousands	County	24.57	50.37	52.01	104.98	12.65
Unemployment rate, 2007	County	1.93	4.48	4.67	14.75	1.44
Percentage of the jurisdiction's minority population	County	1.41	28.35	31.55	86.70	19.15
Percentage of owner-occupied housing units	County	30.70	67.40	66.61	84.30	8.73
Percentage of population, selected age groups						
Age 15 to 24		7.86	13.83	14.53	46.72	3.33
Age 25 to 34		5.36	13.38	13.47	20.68	1.98
Age 35 to 44	County	6.14	14.67	14.59	19.95	1.57
Age 45 to 54		6.59	14.40	14.27	20.07	1.48
Age 55 to 64		5.53	10.18	10.20	17.19	1.41
Age 65 to 74		3.48	6.04	6.29	16.07	1.52
Jurisdiction population as of 2007, in thousands	Juris	0.77	59.15	148.48	3199.44	312.20
Crime rate, 2007	Juris	0.06	3.92	4.37	12.05	2.47

[a] Column denotes level of government in which data was available. Jurisdiction (juris.) corresponds to the city in which the agency is located.
[b] For categorical variables, numbers in this column represent relative frequency of each category.
[c] A set of ten community policing items have been factor analyzed to derive a single factor

Table 3. Logit Analysis of the Use of Volunteers

Variables	Model 1 Coefficients[a]	ΔOR[b]	Model 2 Coefficients[a]	ΔOR[b]
Demand side				
Council-Manager form of government	0.61 (0.19)**	84.48	0.55 (0.20)***	73.90
Tax burden	-0.25 (0.13)**	-21.96	-0.29 (0.12)**	-25.02
Agency size (total number of paid personnel)	0.00 (0.00)	0.03	0.00 (0.00)	0.03
Size of agency annual budget	0.14 (0.12)	15.28	0.16 (0.13)	17.51
Union strength	-0.02 (0.01)***	-1.70	-0.01 (0.01)*	-1.22
Community Policing	1.19 (0.38)***	69.57	1.16 (0.39)***	68.56
Minority Representation	0.02 (0.09)	2.35	0.05 (0.09)	4.77
Supply side				
Value of owner-occupied housing	0.00 (0.00)*	0.63	-0.04 (0.01)***	-4.14
Value of owner-occupied housing, squared	-	-	0.00 (0.00)***	0.01
Percentage of minority population	0.01 (0.01)	0.71	0.04 (0.02)**	4.58
Percentage of minority population, squared	-	-	-0.00 (0.00)**	-0.05
Unemployment rate	0.23 (0.08)***	12.41	0.26 (0.08)***	29.11
Median-household income	-0.01 (0.02)	- 0.41	0.18 (0.06)***	20.22
Median-household income, squared	-	-	-0.00 (0.00)***	-0.13
Percentage of owner-occupied housing	-0.01 (0.02)	-0.80	-0.01 (0.02)	-1.37
Percentage of age group, 15 to 24	-0.02 (0.06)	-2.21	0.02 (0.06)	1.92
Percentage of age group, 25 to 34	0.10 (0.10)	10.46	0.14 (0.11)	14.92
Percentage of age group, 35 to 44	-0.19 (0.13)	-17.11	-0.11 (0.12)	-10.82
Percentage of age group, 45 to 54	0.05 (0.17)	4.74	-0.02 (0.18)	-1.98
Percentage of age group, 55 to 64	0.19 (0.17)	21.52	0.36 (0.18)**	42.63
Percentage of age group, 65 to 74	0.02 (0.18)	2.13	0.01 (0.18)	0.72
Population of jurisdiction	0.00 (0.00)	0.00	0.00 (0.00)*	0.00
Population of jurisdiction, squared	–		0.00 (0.00)**	0.00
Crime rate	0.00 (0.04)	0.26	-0.00 (0.04)	-0.20
N	750		750	
Adj. R^2	0.19		0.16	
Likelihood Ratio	155.20		99.53	

*p < .10, **p < .05, *** p < .01 (one-tailed test)

[a] Standard errors in parentheses.

[b] Percentage change in odds ratio

Table 4. Tobit Analysis of the Use of Volunteers

Variables	Model 1 Coefficients[a]	ΔUEV[b]	ΔCEV[c]	ΔProb[d]	Model 2 Coefficients	ΔUEV[c]	ΔCEV[d]	ΔProb[e]
Demand side								
Council-Manager form of government	0.26 (0.19)***	14.54	10.32	13.83	0.25 (0.07)***	13.82	9.81	13.31
Tax burden	-0.09 (0.13)**	-5.05	-3.59	-4.81	-0.10 (0.04)***	-5.76	-4.09	-5.54
Agency size (total number of paid personnel)	0.00 (0.00)	0.01	0.00	0.01	0.00 (0.00)	0.01	0.00	0.01
Size of agency annual budget	0.14 (0.12)***	7.61	5.40	7.24	0.09 (0.04)**	5.29	3.76	5.10
Union strength	-0.01 (0.01)***	-0.40	-0.28	-0.38	-0.01 (0.00)**	-0.30	-0.21	-0.29
Community Policing	0.48 (0.38)***	26.61	18.89	25.31	0.46 (0.13)***	25.50	18.11	24.56
Minority Representation	0.02 (0.09)	0.88	0.62	0.83	0.01 (0.03)	0.77	0.55	0.74
Supply side								
Value of owner-occupied housing	0.00 (0.00)*	0.08	0.06	0.08	-0.00 (0.00)	-0.17	-0.12	-0.16
Value of owner-occupied housing, squared	-	-	-	-	0.00 (0.00)**	0.00	0.00	0.00
Percentage of minority population	0.00 (0.00)***	0.18	0.13	0.18	0.02 (0.01)***	0.98	0.70	0.95
Percentage of minority population, squared	-	-	-	-	-0.00 (0.00)**	-0.01	-0.01	-0.01
Unemployment rate	0.08 (0.03)	4.31	3.06	4.10	0.08 (0.03)***	4.47	3.17	4.30
Median-household income	0.00 (0.01)	0.09	0.06	0.08	0.04 (0.02)*	2.04	1.45	1.96
Median-household income, squared	-	-	-	-	-0.00 (0.00)*	-0.01	-0.01	-0.01
Percentage of owner-occupied housing	-0.00 (0.01)	-0.05	-0.03	-0.04	-0.00 (0.01)	-0.16	-0.11	-0.16
Percentage of age group, 15 to 24	-0.01 (0.02)	-0.64	-0.46	-0.61	-0.01 (0.02)	-0.33	-0.23	-0.32
Percentage of age group, 25 to 34	0.04 (0.04)	2.03	1.44	1.93	0.04 (0.04)	2.06	1.46	1.98
Percentage of age group, 35 to 44	-0.08 (0.04)*	-4.44	-3.15	-4.22	-0.08 (0.04)*	-4.30	-3.05	-4.14
Percentage of age group, 45 to 54	0.01 (0.06)	0.42	0.30	0.40	-0.01 (0.06)	-0.45	-0.32	-0.43
Percentage of age group, 55 to 64	0.08 (0.06)	4.61	3.27	4.38	0.11 (0.06)*	6.39	4.53	6.15
Percentage of age group, 65 to 74	-0.02 (0.06)	-1.22	-0.87	-1.17	-0.03 (0.06)	-1.40	-1.00	-1.35
Population of jurisdiction	-0.00 (0.00)	0.00	0.00	0.00	0.00 (0.00)	0.00	0.00	0.00
Population of jurisdiction, squared	–				0.00 (0.00)*	0.00	0.00	0.00
Crime rate	-0.00 (0.01)	-0.11	-0.08	-0.10	0.00 (0.01)	0.01	0.01	0.01
N	750				750			
Adj. R^2	0.09				0.10			
Likelihood Ratio	144.19				158.40			

*p < .10, **p < .05, *** p < .01 (one-tailed test)

CHAPTER 5

ESSAY 2: COPRODUCTION AND PERFORMANCE

Introduction

One major proposition linking coproduction to service performance is that the addition of citizen inputs can enhance service provision levels (Needham 2008; Percy 1984; Verschuere, Brandsen and Pestoff 2012). Prior studies on the effects of coproduction generally consist of case studies that provide insight in specific settings, but this limits the extent to which they are generalizable in other contexts. Also, service quality is subject to a wide range of measurement concepts and depends on the type of service as well as the type of coproduction activity (Bovaird 2007; Vamstad 2012). Recently, the literature has witnessed several large-N empirical efforts to explore citizen coproduction in specific areas such as education or law enforcement performance (Hong 2016; Stritch 2016). However, systematic studies on the effects of coproduction are still limited, and more inquiry on how citizen inputs can improve organizational performance is necessary.

This chapter addresses this gap by investigating the effects of collective coproduction on service outcomes. Collective coproduction involves activities such as organized volunteer programs where citizens participate in an institutionalized capacity and are undertaken in direct cooperation with public agencies (Brudney and England 1983; Brudney 1984). Although citizens in this capacity may be required to undergo extensive periods of formal training, imposing additional costs on agencies to certify and coordinate volunteers, the expectation is that citizen

volunteers can yield a net decrease in service expenditures as well as enhance service effectiveness.

This chapter derives the empirical case from the use of volunteer police officers in law enforcement. Volunteer officers represent an unpaid but well-trained, professional pool of citizens that "provide a meaningful nexus between the police and the communities they serve" (Dobrin and Wolf 2016). Since there are a variety of ways in which volunteers may be utilized in policing, the focus is on volunteers endowed with law enforcement authority. While volunteer officers represent a long-lived and widespread phenomenon in the United States, there is very limited empirical research in both the public and non-profit management as well as the criminal justice literature regarding their impact on service outcomes. Therefore, this chapter engages in a systematic analysis of the effects of volunteer officers on a police outcome measure, clearance rates, which represents the ability of police organizations to solve crimes through arrests. Data are derived from a national sample of law enforcement agencies in the United States that utilize unpaid sworn volunteer officers, formally known as reserve/auxiliary personnel, in law enforcement duties. Using a formal model of public management to explore how volunteer officers act as a resource available from the environment, the analysis finds that volunteer officers are positively associated with performance when augmenting existing personnel, while the opposite effect occurs when used as substitutes. In addition, agencies benefit more from using volunteer officers to assist in clearing violent crimes than property crimes. These findings provide implications for the way coproduction programs are managed and how they contribute to service performance.

This chapter is organized as follows. The next section outlines the theoretical argument by exploring the concept of coproduction and its relation to service performance. The subsequent

sections present the data and methods, followed by the analysis and results. The chapter concludes with implications of the findings.

The Coproduction Concept

Coproduction entails the joint production of public services by service agents and citizens (Brandsen and Honingh 2015; Bovaird 2007; Bovaird and Loeffler 2013). The concept denotes a departure from the traditional mode of service delivery where government is considered the sole provider of services and in which citizens are viewed as passive recipients (Sharp 1980). Coproduction is not an entirely new conceptualization, nor is the departure from the government-centered mode a recent phenomenon. Early scholarship of the 1970s had pointed out the fragmented and inter-organizational context of service delivery as well as the active participation of clients in influencing service outcomes (Ostrom and Whitaker 1973; Ostrom, Parks, and Whitaker 1974), while the 1990s witnessed the prevalence of New Public Management and its variants such as contracting out. However, in recent years there has been an increasing recognition that citizens play a more significant role in contributing to service delivery.

Scholars have offered a number of different definitions. Some propose a narrow definition which limits coproduction to the relationship between public employees and citizens as service users (Joshi and Moore 2004; Parks et al. 1981). Others assume a broader definition by including volunteers as coproducers (Alford 2002; Bovaird 2007; Bovaird and Loeffler 2013). Although there is overlap between the two, a key difference is that service users directly consume a service and derive personal benefits, whereas volunteers denote citizens who deliver services on behalf of others and do not derive direct, material benefits from coproducing (Alford 2002). In terms of distinguishing between different types of activities, Brudney and England

(1983) differentiate between individual, group and collective coproduction. Brandsen and Honingh (2015) categorize according to whether citizens are involved in core or complimentary activities and whether coproduction involves the design or implementation phase or both.

In line with the broader definition of coproduction, this chapter centers on volunteers as citizen coproducers and explores collective coproduction where citizens are involved in an institutionalized capacity. Examples include "citizen mass-volunteer programs" which contrasts with more conventional forms of coproduction such as neighborhood watch groups or individual household activities (Brudney 1984: 475). While citizens do not necessarily have to join an organization, scholars have noted how participating in an organizational capacity has the potential to enhance the levels of coproduction and better facilitate coordination between public organizations and the community (Pestoff 2014).

Coproduction and Performance

Among the advantages of coproduction, a major proposition is that citizen coproduction has the potential to improve the quality or quantity of service provision. The underlying argument is that the addition of citizen inputs can increase the amount of agency resources devoted to producing services (Ostrom 1996; Percy 1984). In services such as education, public health, or public safety which involve the transformation of human behavior or attributes, citizen inputs to the service production process are critical for the actions of service agents to be effective (Whitaker 1980). If coproduction is central to service delivery, then responsibility for agency performance does not rest primarily upon the actions of service agents but rather becomes contingent upon the joint efforts with citizens. However, the question of whether citizens can effectively contribute to service improvements requires empirical investigation.

Klingner (1983) discusses three criteria with respect to the evaluation of municipal productivity, which includes the dimensions of efficiency and effectiveness. First, cost efficiency centers on the unit costs of producing a service where the lower the cost for a unit of service, the more efficient the production method. Second, cost effectiveness compares the costs and benefits of programs to examine whether less expensive methods are able to reach the same goals. Finally, program worthiness evaluates programs according to the process by which goals are pursued and whether they abide by political, social or moral standards.

Brudney (1984) examines these three criteria within the context of coproduction programs. In terms of cost effectiveness, the issue is whether coproduction programs can generate improvements in service quality. In the case of collective coproduction programs that involve citizens as part of the regular public workforce, even if the benefits of using volunteers are able to offset the administrative costs of training and managing them so that these programs yield a net decrease in service expenditures, the question remains as to whether better services, or even the maintenance of existing service levels, are provided. Parks et al. (1981) discuss how the technical nature of many governmental tasks restrict the ability of citizens to fully replace service agents who possess professional knowledge and experience that is crucial to effective service performance. Even volunteers who undergo intensive screening and specialized training cannot be expected to substitute for paid professionals and maintain present service levels. Largescale substitution would rather undermine the need for professional education and certification in formal public employment. Thus, scholars point out that the potential of coproduction programs should be contingent upon citizens' efforts to assist or complement service agents rather than substitute them in service provision (Percy 1983).

Based on this criterion, this chapter examines the case of volunteer police officers in law enforcement and their impact on service effectiveness. Otherwise known as reserve/auxiliary personnel, volunteer officers are defined as "trained civilians who volunteer their time to conduct law enforcement duties for the agency" (U.S. Department of Justice 2013b: B4). While these are sworn positions endowed with law enforcement authority, a key feature is that they volunteer on an unpaid basis.[14] On the one hand, the criminal justice literature discusses the concept of "civilianization" which centers on resorting to alternative manpower resources to reduce costs and improve services. However, while early studies include volunteers in this labor pool (Berg and Doerner 1988; Greenberg 1979), more recent studies refer to civilianization as the use of non-sworn paid civilians usually employed in specialized positions in communications, forensics, computer specialists, and other support functions (Alderden and Skogan 2012; Forst 2000; Maguire et al. 2003). Therefore, conceptually, volunteer officers closely match the description of prior studies on collective coproduction programs that incorporate "large numbers of citizen volunteers into the service bureaucracy as part of the regular public workforce" and are "matched with a set of work activities in service agencies for which they are trained or otherwise judged competent" (Brudney 1984: 475).

On a practical level, there is great variation in terms of the level of authorization across states as well as how different agencies utilize volunteer officers for different purposes (Wolf, Albrecht and Dobrin 2015; Wolf, Holmes and Jones 2016). Some volunteers may be fully sworn and certified, while others may possess limited or no certification. Agencies, such as the Los Angeles Police Reserve Corps, may authorize volunteer officers to carry arms and engage in

[14] In some jurisdictions, volunteer police may refer to part-time paid positions, which is beyond the scope of this chapter. See Dobrin and Wolf (2016) for a comprehensive review on volunteer police officers.

formal arrests. Others, such as the New York City Police Department Auxiliary Police Program, may restrict the use of lethal force. Despite these variations, the significance for coproduction research lies with the fact that this group of coproducers are unpaid, engage in the delivery of services on behalf of other citizens, and serve as a bridge between professional service agents and the community (Bovaird and Loeffler 2013; Frederickson and Levin 2004).

Concerning their impact on service effectiveness, the primary hypothesis is that the use of volunteer officers should lead to more effective service provision. However, as mentioned before, there are problems associated with volunteers substituting for formal officers. Since scholars argue that coproduction programs should rely on volunteers to complement rather than fully replace agency personnel, the primary hypothesis is broken down into the following two hypotheses:

> Hypothesis 1: The use of volunteer officers, if used as complements, will be positively associated with service effectiveness.

> Hypothesis 2: The use of volunteer officers, if used as substitutes, will be negatively associated with service effectiveness.

These two hypotheses are tested on a measure of police outcome, clearance rates, which represents the ability of police agencies to solve crimes. Prior studies have used clearance rates as an indicator of what police organizations are able to accomplish through their own initiatives (Alpert and Moore 1993; Nicholson-Crotty and O'Toole 2004; Pare, Felson and Quimet 2007; Weisburd et al. 2010). Clearance rates are deemed a stronger measure of police performance than

other outcomes such as crime rates which are influenced by various socio-economic factors and are considered beyond the control of what police organizations can directly influence (Mastrofski 1999). However, scholars have noted several limitations that question the reliability and validity of clearance rates (Brodeur 1998; Cordner 1989; Loveday 1999; Maguire 1997; Walker 1992). For instance, arrests are highly likely to be affected by the number of reported crimes. Regardless of the quality of police performance, higher crime areas might have more arrests made. In addition, different jurisdictions vary in their recording practices and how they define what is a cleared incident, making it problematic to accurately compare performance across police agencies. Because of this, clearance rates are also vulnerable to manipulation where police managers might be pressured to increase the perception that agency performance has improved. Nonetheless, studies note that clearance rates continue to be commonly used as measure of assessing police performance compared to alternative measures (Pare, Felson, and Quimet 2007; Weisburd et al. 2010). For this chapter, the advantage is that clearance rates focus directly on the managerial activities of police organizations. This is important for exploring the use of citizen volunteers within the context of public management.

Model of Public Management

This section briefly covers a theoretical model of public management used by prior studies to explore how managerial activities and environmental resources and constraints affect organizational performance (Nicholson-Crotty and O'Toole 2004; O'Toole and Meier 2003). Within this context, volunteer officers are considered a resource that agencies can leverage from the policing environment.

O'Toole and Meier (1999) devise a formal model of public management that specifies a set of internal and external managerial activities as well as environmental resources and constraints and their impact on performance. The specific set of activities performed by managers vary according to policy realms and organizations, but the core idea is that management entails "the tasks of motivating and coordinating actors toward performance consistent with established intent" (1999: 510). O'Toole and Meier embed their theoretical exposition into the following equation:

$$O_t = \beta_1(S + M_1)O_{t-1} + \beta_2(X_t/S)(M_3/M_4) + e_t \qquad [1]$$

The model specifies a set of formal internal functions (M_1) that managers are required to perform in addition to external activities (M_3 and M_4) that are necessary to exploit the environment or buffer from environmental shocks. The model is autoregressive, nonlinear, and contingent in that the regressive component (O_t) is captured by the lagged dependent variable (O_{t-1}) requiring time-series data for estimation purposes. In addition, the nonlinear elements are depicted by the various interaction effects, and the model is contingent on the stability (S) of the administrative system. The underlying three concepts that encompass the model are hierarchy, networks, and management. The first two are structural notions that depict the degree of superior-subordinate authority linkages and how they contribute to organizational stability. Hierarchies are usually located within a single agency and provide stable and cooperative efforts, while networks are characteristic of instability and uncertainty due to the multiplicity of units involved. The set of managerial activities denote efforts to leverage inputs to performance, respond to environmental disturbances that may affect performance, and reshape the structural setting in which

management and operations function. Managerial activities occur in both the hierarchical and network structures.

In their application of the model to law enforcement agencies, Nicholson-Crotty and O'Toole (2004) simplify equation [1] by omitting the set of internal stabilizing influences (S) on the grounds that police organizations tend toward fairly similar hierarchical structures. They replace (M_3/M_4) with (M_2) which represents external management activities. Finally, the term (X_t) is a matrix of environmental influences, with the external management setting containing more elements of such influences than the internal/hierarchical management structure. The model is simplified according to the following:

$$O_t = \beta_1 M_1 O_{t-1} + \beta_2 X_t M_2 + e_t \qquad [2]$$

The term ($\beta_1 M_1 O_{t-1}$) suggests that police performance is autoregressive in that current performance is highly constrained by performance from the previous year. The internal management activities (M_1) are directly related to current performance (O_t) when controlling for past performance (O_{t-1}), and the inertial term's impact is contingent upon the extent of internal management. The measure for internal management (M_1) was initially devised in terms of supporting the operational status quo, but the interaction with past performance implies that internal functions support both broader current functions as well as help to improve performance through internal innovation. Thus, improved internal management is expected to reduce the impact of being constrained by past performance.

The second term ($\beta_2 X_t M_2$) explores managerial activities external to the organization. It suggests that externally-oriented management activities (M_2) contribute directly to agency

performance (O_t) by leveraging available resources or buffer from external constraints, while also demonstrating the interaction between external management and the set of environmental factors (X_t). For this chapter, volunteer officers (reserve/auxiliary personnel) are included as an environmental resource that police organizations can leverage to improve performance. Given the scholarly attention on measuring the link between coproduction and service performance, the impact of volunteer officers is of particular interest.

Data and Measures

The data for the analysis are derived from three sources. First, index crimes and crimes cleared by arrest come from the Federal Bureau of Investigation's Uniform Crime Reports (UCR) for the year 2012 and 2013. These are collected from more than 16,000 law enforcement agencies which employ at least one full-time officer, and represent about 95 percent of the total population in the United States. Second, data on managerial activities are derived from the 2013 Law Enforcement Management and Administrative Statistics (LEMAS) survey which contains information about agency operations, personnel policies, weapons and armor policies, community policing, and others. This is sent to the heads of more than 3,000 state and local law enforcement agencies within the United States that employ one hundred or more sworn officers and a nationally representative sample of smaller agencies. The response rate for the survey is 86% (n=2,822), and responses were drawn from 2,059 local police departments, 717 sheriffs' offices, and 46 state law enforcement agencies. Finally, environmental and demographic factors are collected from the U.S. Census Bureau.

Measures

The dependent variable, clearance rates, is operationalized as the percentage of crimes cleared by arrest. This measure is calculated as the total number of crime cases, not the number of offenders, cleared by arrest and divided by the number of actual crimes within a year, and multiplied by one hundred.[15] In addition to a total clearance rate that consists of all "index" crimes, two separate clearance rates for violent crimes and property crimes are included in the analysis.[16]

For the independent variables, foremost, internal management (M_1) represents the set of activities that are devoted to improving the internal operations of the department. While it is infeasible to explore all such managerial efforts of police departments, the LEMAS survey contains data on several managerial initiatives devoted to improving the internal operations of police organizations, especially the management of agencies' human resources (Nicholson-Crotty and O'Toole 2004). These are selected on the basis of key managerial goals of improving performance such as examining and correcting problems, training and motivating employees, making strategic budget allocations, introducing innovative technologies to improve policing operations, and evaluating current practices (Hatry 1999). The specific survey items are as follows: presence of educational requirements for officers; the presence of additional law enforcement training for lateral/pre-service hires; the presence of a collective bargaining organization for officers and the status of the collective bargaining agreement; investment in

[15] While agencies cannot report more clearances than offenses in a given month, the exception is when agencies score clearances that were reported in previous months (U.S. Department of Justice 2013a: 113). For instance, if a suspect is arrested for one offense in January, and is subsequently identified in connection with four other separate offenses reported in prior months, this sums to five cleared offenses for the month of January. This explains why the clearance rate may be greater than 100 percentage in some jurisdictions.

[16] Index crimes refer to criminal homicide, forcible rape, robbery, aggravated assault, burglary, larceny-theft, and motor vehicle theft. Violent crime consist of criminal homicide, forcible rape, robbery, and aggravated assault. Property crimes are composed of burglary, larceny-theft, and motor vehicle theft.

technology allowing officers to access motor vehicle records, driver license records, criminal histories, outstanding warrants, protection orders and address histories; and the comprehensiveness of written directives that include procedures on the use of deadly force, use of less-than-lethal force, vehicle pursuit, foot pursuit, and the use of body armor. These items are factor analyzed to derive a single measure of internal management using a Polychoric technique since nearly all of the measures are dichotomous. Factor loadings that generated an acceptable threshold of .34 or better were retained from the first factor (eigenvalue 4.82). Since the factor scores are standardized, one unit is equivalent to one standard deviation.

Second, the measure for external management (M_2) represents the set of activities of managing in the environment, allowing for agencies to leverage resources and buffer from constraints. The LEMAS survey contains a section on community policing activities that agencies engage in, and this is categorized as the set of externally-oriented, networking activities. The following items are selected: community policing activities such as training of new recruits and in-service training for existing personnel, engaging in SARA-type problem-solving activities, and assigning officers to areas or beats; networking activities such as engaging in collaborative problem-solving projects and having a problem-solving agreement with community groups; and having a public feedback system such as surveying local residents about satisfaction with the police or perceptions of crime. While prior studies have generally used measures of citizen satisfaction to measure the effectiveness of such activities (Leishman and Mason 2003), these activities are also expected to influence the ability of officers to clear crimes through arrests such as by reducing information asymmetries between the police and the community or encouraging citizens to coproduce public safety (Nicholson-Crotty and O'Toole 2004). Also, several community policing strategies are designed to enable police officers to systematically

identify and respond to problems, enhancing officers' abilities to solve crimes (Scheider, Chapman and Schapiro 2009). The items for external activities are factor analyzed using a Polychoric technique to derive a single measure. All of the factor loadings exceeded .50 (eigenvalue 2.97), and the resulting score is used as the measure of external management.

Finally, the vector of environmental variables (X_t) contains seven measures that act as a resource or constraint to police agencies and are expected to influence clearance rates (Nicholson-Crotty and O'Toole 2004). Crime rate is included because clearance rates are a function of the level of crime and the latter is expected to act as a constraint on the agency due to the difficulty imposed on core crime-fighting tasks. Second, "extra" or peripheral tasks are constraints on the department as they can divert personnel from the core responsibilities of the department. This is operationalized as the ratio of full-time sworn personnel engaging in other duties to full-time sworn personnel engaging in core duties such as patrol, investigation, and jail-related and court-related duties. Third, positive staff size change should act as resource in enabling police officers to devote more time and energy to core tasks. This is calculated as the difference in staffing levels (full-time equivalent) between 2011 and 2012, divided by population change between the same two years. Fourth, reserve/auxiliary personnel (volunteer officers) are included as a resource to law enforcement agencies, constituting the measure of coproduction. Two separate measures are analyzed: the number of reserve/auxiliary personnel which examines augmentation to existing personnel, and the ratio of reserve/auxiliary personnel to full-time sworn personnel which examines the substitution effect. Fifth, hiring freeze is a binary variable that indicates whether an agency implemented a hiring freeze between January 1, 2010 and December 31, 2012. This is expected to act as a constraint on the organization. Meanwhile, a measure for minority representation calculated as the percentage of full-time minority officers to

the percentage of minorities in the jurisdiction is included as a resource (Ozkan, Worrall, and Piquereo 2016). A ratio of "one" indicates that there is greater equality between the community and police in terms of racial representation. The hypothesis is that managerial efforts to expand minority representation within police organizations should generate greater trust and legitimacy of law enforcement, leading to greater cooperation and coproduction from minority citizens, and ultimately contributing to agency efforts to solve crimes (Riccucci and Van Ryzin 2016). Finally, the total operating budget per capita for the 12-month period beginning from January 1, 2013 is included. A larger budget should allow agencies more slack in devoting resources to clear crime through arrest. For the control variables, total population, population density and percentage of minority population in the jurisdiction are included. A summary of the descriptive statistics is provided in Table 5.

Results

Additive Model

Before estimating the interactions specified in equation [2], the analysis estimates an additive model to examine the linear impact of the variables. This is the basic approach where management is considered to be another input to production and where it influences performance in a linear manner (O'Toole and Meier 1999). The results for the direct effect of internal, external and environmental variables on total clearance rates are provided in Table 6, while Table 7 explores their impact on violent and property crimes. The results in both Table 6 and Table 7 show the highly autoregressive nature of police performance. Current performance is significantly affected by past performance as observed by the positive coefficients for clearance rates and crime rates, representing the highly inertial nature of law enforcement organizations.

Examining the set of managerial activities, Table 7 shows that internal management is only statistically significant for violent crime clearance. This is in contrast to the results by Nicholson-Crotty and O'Toole (2004) who found a positive and significant impact for total clearance rates. The current findings indicate that the internal managerial activities composed of human resource decisions, technological innovations, and comprehensiveness of written directives are significant in clearing violent crimes than property crimes. Meanwhile, the set of external managerial activities comprised of networking and other community-oriented management activities are significant but negatively associated with clearing property crimes. This contradicts the hypothesis that external activities should contribute to enhancing the ability of officers to clear crimes through arrest, suggesting that these activities may divert officers from core crime-fighting activities to more externally-oriented activities.

For the environmental and control variables, crime rate, staff size change, volunteer officers, minority representation, and population size are statistically significant only for total clearance rates in Table 6. Crime rate is positively associated with clearance rates, contradicting the hypothesis that higher crime renders greater task difficulty and reduces the ability of police agencies to clear crimes by arrest. However, this may confirm a prior limitation of clearance rates in which higher crime areas might have more arrests made, regardless of the quality of police performance. In fact, the positive coefficients for staff size change shows that clearance rates rise in conjunction with an increase in staffing levels. More staff could mean that an agency is faced with greater service demands for dealing with crime in a jurisdiction, leading to subsequent increases in the number of arrests made. Meanwhile, minority representation is statistically significant for both the number and ratio. This demonstrates that greater representation can be a resource for enhancing the capacity of police agencies to clear crimes.

Population is negatively associated with clearance rates, suggesting that an increase in population complicates the tasks of clearing crimes effectively. Finally, the use of volunteer officers is statistically significant for both the ratio and numbers. A one percentage point increase in the number of volunteer officers is associated with a 0.02 percentage point increase in performance, while the opposite effect of a 0.02 percentage point decrease in performance occurs for the ratio of volunteer officers. This confirms the first hypothesis in which the use of volunteer officers as complements to existing personnel contributes to better performance. The second hypothesis is also confirmed where the use of volunteer officers as substitutes decreases performance.

Separating the results for violent and property crime clearance in Table 7, the number of volunteer officers is positively associated with clearing violent crimes, while the ratio of volunteer officers is negatively associated with clearing property crimes only. Substantively, this shows that agencies benefit more from using volunteer officers to assist in addressing violent crimes. On the other hand, the decrease in performance for property crimes when using volunteers as substitutes suggests that they are not likely to be effective in maintaining present levels of property crime clearance.

Meanwhile, for property crime clearance, one puzzling finding is that the ratio of full-time officers engaged in peripheral tasks is positively associated with an increase in performance. The same applies for the positive effect of agency hiring freeze. These two variables contradict the hypothesis of functioning as a constraint on police organizations. One possible explanation might be that such reductions in manpower lead to a subsequent decrease in agencies' capacity to solve property crimes, thereby increasing the property crime rate. However, the positive association between staff size change and total clearance rates observed in Table 6

may be offsetting this spike in the property crime rate. Nonetheless, it is difficult to ascertain a precise causal link from the current analysis.

As for other resources and constraints in Table 7, population density is negatively associated with clearing violent crimes, while population size is negatively associated with clearing property crimes only when volunteer officers are used as substitutes. Overall they indicate that these variables impose a constraint on police agencies and that performance is negatively affected in highly populated urban areas. Meanwhile, the percentage of minority population is positively associated with clearing property crimes only. However, since the variable for minority representation is not significant for property crime clearance, it may be that jurisdictions with a higher proportion of minorities face a higher property crime rate and therefore more arrests are made, regardless of the quality of police performance.[17]

Interaction Between Internal Management and Past Performance

For the interaction model estimating the nonlinear relationship between internal management and organizational performance, the results in Table 8 reveal that internal management interacts significantly with past performance. The interaction term shows that as internal management increases, the impact of the lagged outcome variable decreases.[18] Substantively, the decreasing importance of past performance indicates that when agency activities designed to improve organizational processes and procedures interact with clearing crimes by arrest, police agencies become less constrained by the status quo and increase the potential for improving performance. The results for crime rate, staff size change, volunteer officers, minority representation, and

[17] The correlation coefficient between the percentage of minorities in a jurisdiction and property crime rate is 0.26.
[18] The variance inflation factor (VIF) for the interaction term is 22.50 for number of volunteer officers and 22.51 for ratio of volunteer officers, indicating a high degree of collinearity. However, a joint significance test of the term determines whether the addition of the interaction term contributes significantly to the explanatory power of the model. The result for number of volunteers is $F(1, 1104) = 7.29$, $p > 0.01$, while ratio of volunteers is $F(1, 1104) = 7.74$, $p > 0.01$, indicating this is the case.

population size are statistically significant. The sign of the coefficients and the scope of effects are similar to the findings in the additive model for total clearance rates.

Separating by violent and property crime clearance rates in Table 9, a key finding pertaining to clearing violent crimes is that internal management interacts significantly with past performance, demonstrating the importance of internal management on clearing violent crimes.[19] However, the interaction is not significant for clearing property crimes. Meanwhile, external management is significant and negative for clearing property crimes only, indicating that these activities may divert personnel from engaging in core activities related to addressing property crimes. As for volunteer officers, the number continues to be positively associated with clearing violent crimes, while the ratio is negatively associated with clearing property crimes. This confirms the prior observation that volunteer officers contribute more to performance when used to complement activities for clearing violent crimes.

Interaction Between External Management and the Environment

Concerning the interaction between external management and the organizational environment, crime rate, staff change, volunteer officers, and minority representation were statistically significant in the additive model, and so these are interacted with external management. Two interactions emerge as statistically significant in Table 10: the variables for the ratio of volunteer officers and minority representation.[20] Examining the interaction for ratio of volunteers, the independent effect has a positive impact on clearance rates, while the negative interaction term suggests that a one-standard deviation positive shift in external management decreases the

[19] The VIF is 2.12 and 2.13 for number and ratio of volunteers, respectively, revealing no multicollinearity.

[20] In the number of volunteer officers column, the VIF for the interaction term for minority representation is 37.01 and $F(1,1101) = 5.26$, $p > 0.05$. In the ratio of volunteer officers column, the VIF for the interaction term for ratio of volunteer officers is 12.72 and $F(1,1101) = 8.56$, $p > 0.001$, while the VIF for the interaction term for minority representation is 37.00 and $F(1,1101) = 6.16$, $p > 0.01$.

positive impact of volunteer officers by 0.07 percentage points. The substantive interpretation is somewhat problematic since the additive model indicates that an increase in the ratio of volunteer officers is negatively associated with clearance rates, and external management is also not significant.[21] These findings may indicate a difference in the way agencies utilize resources for different organizational goals. More specifically, without an interaction, the additive model only explores agencies' use of volunteer officers to either substitute or complement full-time sworn personnel. However, the interaction looks at how agencies use volunteer officers when engaging in externally-oriented activities. While volunteer officers may independently contribute to improving performance, their diversion to assisting in external activities such as networking and community-oriented activities may decrease the amount of resources devoted to assisting in core activities such as crime prevention, leading to a decrease in performance.

In terms of the interaction for minority representation, in contrast to the additive models, the independent effect has a negative impact on clearance rates, while the positive interaction term suggests that a one-standard deviation positive shift in external management decreases the negative impact of minority representation by 1.21 and 1.25 percentage points, respectively. In the context of the interaction, while minority representation is independently associated with a decrease in performance, agencies that engage in external managerial activities are able to reduce the negative impact of minority representation and use this as a leverage for improving clearance rates.

Finally, separating between violent and property crime clearance in Table 11, among the key findings is the interaction between violent crime and external management, suggesting that

[21] Adding interaction terms drastically change the interpretation of the coefficients. This explains the contrasting findings from the additive models as well as the interaction model between internal management and past performance. For interaction models, the unique effect of a variable has to be examined in conjunction with the interaction.

externally-oriented managerial activities can reduce the impact of an environmental constraint on clearing violent crimes. Meanwhile, the independent effect of the number of volunteer officers has a positive association with clearing violent crimes, while the interaction term for the ratio of volunteers indicates that agencies that engage in external managerial activities are able to improve clearing violent crimes even when volunteers are used as substitutes. In terms of property crimes, the interaction term for number of volunteers reveals that when agencies engage in external managerial activities, this is associated with a decrease in performance, indicating that these activities may divert personnel devoted to clearing property crimes. Overall, the primary implication for coproduction is that volunteer officers contribute more to improving performance for violent crimes rather than property crimes.

Implications

To examine how one form of coproduction activity, collective coproduction, contributes to service effectiveness, this chapter applies a formal model of public management on a large-N dataset to test prior theories about how management can shape performance and other public outcomes. It expands upon a prior study by Nicholson-Crotty and O'Toole (2004) by decomposing the clearance rate into violent crime and property crime clearance, and includes additional environmental resources and constraints. In addition to examining how internal and managerial activities improve performance, the analysis provides an additional contribution to the literature by testing the theoretical expectations about the impact of citizen volunteers on organizational performance.

In terms of the implications for coproduction theory, the results confirm the hypotheses that the use of volunteer officers is positively associated with service outcomes when used as

complements, while negatively associated with service outcomes when used as substitutes. Their differential impact becomes clearer when decomposing the results into violent and property crime clearance rates. The results suggest that agencies benefit more from volunteer officers assisting full-time personnel in clearing violent crimes rather than property crimes. In addition, from the interaction models, when externally-oriented activities are implemented, they decrease the positive impact of using volunteer officers for clearing property crimes. However, these activities may contribute to clearing violent crimes even when volunteer officers are used as substitutes.

Overall, the findings lend support to prior theories about how volunteers, even when they undergo specialized training and certification that renders them capable of assuming certain professional functions, cannot fully substitute for full-time paid personnel while expecting to maintain current service levels. Rather, the results confirm the notion that agencies can benefit from coproduction programs where citizen volunteers assume a role of assisting rather than replacing service agents. The broader implication for practice is that citizen volunteers can function as a valuable resource adding further leverage for public organizations to utilize in fighting crime.

Several limitations of this study merit discussion. Foremost, this chapter examines the use of volunteer officers who are highly trained and who coproduce in an institutionalized setting. This is a relatively rare form of coproduction activity compared to more general volunteering activities in police organizations or other forms of citizen coproduction in public safety, limiting the generalizability of the findings to this type of coproduction. Second, the LEMAS survey does not provide information about the precise activities that volunteer officers engage in. For instance, while the results indicate that volunteer officers are more useful for clearing violent

crimes, police organizations vary in terms of training and authorizing volunteer officers as well as utilizing them in different ways. For those interested in how volunteer officers exactly contribute to performance, future studies could address some of these issues by resorting to qualitative research designs that explore volunteer officers' activities in specific settings. Meanwhile, the research design does not enable a causal analysis of whether the use of volunteer officers determines performance or whether lower performance drives agencies to resort to the use of volunteer officers. Studies could develop longitudinal data or devise experimental designs to strengthen such causal analyses. Finally, although not the focus of this chapter, the measure on minority representation provides a venue for testing the impact of representative bureaucracy on performance as well. Future research can expand upon the findings and explore these implications further.

Table 5. Descriptive Statistics

Variables	Min	Median	Mean	Max	SD
Clearance rate, 2013	0	30.65	32.45	124.62	20.21
Violent crimes	0	59.34	57.37	140	27.75
Property crimes	0	18.18	21.63	132.61	18.57
Clearance rate, 2012	0	29	30.96	154.55	19.76
Violent crimes	0	57.63	55.49	157.69	28.40
Property crimes	0	16.91	20.11	136.72	17.61
Internal management (M_1)	1.21	1.49	1.64	2.47	.39
External management (M_2)	-.05	.86	.86	1.8	.37
Crime rate, 2013	0	16.66	36.94	4633.76	151.53
Violent crimes	0	7.18	11.42	2903.23	62.22
Property crimes	0	18.76	23.35	1258.01	32.48
Minority Representation	0	.31	.91	139.42	3.67
Staff size change	-7.25	0	-.01	2	.27
Number of volunteer officers	0	0	9	4137	84.13
Ratio of volunteer officers	0	0	12.25	442.86	31.37
Ratio of FT officers engaged in extra tasks	0	9.09	11.16	100	11.31
Agency implemented hiring freeze (binary)	1	2	1.80	2	.4
Operational budget per capita, in millions	.03	4.90	27.78	4612.69	133.98
Population	196	25,205	2,106,429	37,855,290	1,273,053
Population density	.3	230.45	1415.16	17179.2	757.56
Percentage minority	0	27.49	24.10	100	32.43

Table 6. Determinants of Clearance Rates, Total Crimes, 2013

	Additive Model					
	Number of Volunteers			Ratio of Volunteers		
Variables	Slope		t	Slope		t
Clearance rate 2012	.83 (.03)	***	27.31	.82 (.03)	***	26.99
Internal Management (M_1)	.79 (1.06)		.75	.83 (1.06)		.79
External Management (M_2)	-.63 (.85)		-.75	-.51 (.84)		-.61
Crime rate 2013	.00 (.00)	***	3.10	.00 (.00)	***	2.90
Staff size change	1.47 (.48)	***	3.07	1.54 (.47)	***	3.27
Number of volunteer officers	.02 (.01)	**	2.12	-		-
Ratio of volunteer officers	-		-	-.02 (.01)	**	-1.94
Minority Representation	.28 (.10)	***	2.79	.29 (.09)	***	3.21
Ratio of FT officers engaged in other tasks	.00 (.03)		.10	.00 (.03)		-.10
Agency implemented hiring freeze	-1.04 (.77)		-1.35	-1.04 (.77)		-1.35
Size of agency budget (per capita)	.00 (.00)		1.07	.00 (.00)		.80
Population (log)	-.69 (.28)	**	-2.43	-.62 (.27)	***	-2.31
Population density	-.00 (.00)		-1.18	-.00 (.00)		-1.28
Percentage minority	.02 (.02)		1.12	.02 (.02)		1.14
R^2	.68			.68		
N	1119			1119		

Numbers in parentheses denote standard errors.
* p < .10, ** p <.05, *** p < .01

Table 7. Determinants of Clearance Rates, Violent and Property Crimes, 2013

	Additive Model							
	Violent Crime Clearance				Property Crime Clearance			
	Number of Volunteers		Ratio of Volunteers		Number of Volunteers		Ratio of Volunteers	
Variables	Slope	t	Slope	t	Slope	t	Slope	t
Clearance rate 2012	.78(.03)***	29.41	.78(.03)***	29.54	.86(.03)***	30.75	.86(.03)***	30.32
Internal Management (M_1)	3.62(1.7)**	2.13	3.69(1.69)**	2.18	.05(.90)	.05	.12(.89)	.13
External Management (M_2)	-.63(1.33)	-.48	-.59(1.32)	-.44	-1.62(.81)**	-1.99	-1.54(.81)**	-1.90
Violent crime rate, 2013	-.07(.05)	-1.39	-.07(.05)	-1.42	-	-	-	-
Property crime rate, 2013	-	-	-	-	.01(.02)	.47	.01(.02)	.47
Staff size change	-4.59(2.95)	-1.56	-4.48(2.97)	-1.51	1.88(1.29)	1.46	1.91(1.3)	1.48
Number of volunteer officers	.04(.01)***	2.58	-	-	.00(.01)	.34	-	-
Ratio of volunteer officers	-	-	-.01(.03)	-.25	-	-	-.02(.01)*	-1.63
Minority Representation	-.03(.27)	-.11	-.02(.27)	-.09	-.28(.24)	-1.17	-.24(.23)	-1.04
Ratio FT officers, other tasks	.03(.05)	.59	.02(.05)	.50	.07(.02)***	2.78	.06(.02)***	2.62
Agency hiring freeze	-1.1(.96)	-1.15	-1.11(.96)	-1.15	-1.09(.55)**	-1.99	-1.08(.55)**	-1.98
Agency budget (per capita)	.00(.00)	1.43	.00(.00)	1.38	.00(.00)	.47	.00(.00)	.19
Population (log)	-.51(.41)	-1.24	-.34(.41)	-.82	-.42(.26)	-1.62	-.44(.25)*	-1.77
Population density	-.00(.00)***	-3.48	-.00(.00)***	-3.50	-.00(.00)	-1.02	-.00(.00)	-1.08
Percentage minority	-.01(.02)	-.65	-.01(.02)	-.63	.02(.02)**	2.21	.04(.02)**	2.16
R^2	.67		.67		.68		.68	
N	1116		1116		1129		1129	

* p < .10, ** p <.05, *** p < .01

Table 8. Interaction: Internal Management and Past Performance, Total Crimes

Variables	Number of Volunteers		Ratio of Volunteers	
	Slope	t	Slope	t
Clearance rate 2012	1.16 (.13) ***	9.16	1.17 (.13) ***	9.24
Internal Management (M_1)	7.12 (2.74) ***	2.60	7.36 (2.74) ***	2.69
Interaction with clearance rate 2012	-.21 (.08) ***	-2.70	-.21 (.08) ***	-2.78
External Management (M_2)	-.74 (.84)	-.88	-.61 (.84)	-.74
Crime rate 2013	.01 (.00) ***	3.27	.01 (.00) ***	3.07
Staff size change	1.46 (.58) ***	2.52	1.53 (.57) ***	2.67
Number of volunteer officers	.02 (.01) **	1.96	-	-
Ratio of volunteer officers	-	-	-.03 (.01) **	-2.06
Minority Representation	.41 (.12) ***	3.36	.43 (.11) ***	3.80
Ratio of FT officers, other tasks	.00 (.03)	-.02	-.01 (.03)	-.22
Agency hiring freeze	-1.02 (.76)	-1.35	-1.02 (.76)	-1.35
Agency budget (per capita)	.00 (.00)	1.05	.00 (.00)	.72
Population (log)	-.63 (.27) **	-2.32	-.58 (.26) **	-2.23
Population density	-.00 (.00)	-.76	-.00 (.00)	-.85
Percentage minority	.02 (.02)	1.25	.02 (.02)	1.27
R^2	.68		.68	
N	1119		1119	

* p < .10, ** p <.05, *** p < .01

Table 9. Interaction: Internal Management and Past Performance, Violent and Property Crimes

Variables	Violent Crime Clearance				Property Crime Clearance			
	Number of Volunteers		Ratio of Volunteers		Number of Volunteers		Ratio of Volunteers	
	Slope	t	Slope	t	Slope	t	Slope	t
Clearance rate 2012	.76(.04)***	21.39	.76(.04)***	21.41	.86(.04)***	1.78	.86(.04)***	21.70
Internal Management (M_1)	.37(1.88)	.20	.51(1.87)	.27	.19(1.06)	.18	.25(1.06)	.23
Interaction with clearance	.05(.03)*	2.09	.05(.03)**	2.03	-.01(.02)	-.44	-.01(.02)	-.46
External Management (M_2)	-.68(1.34)	-.51	-.56(1.33)	-.42	-1.72(.83)**	2.06	-1.64(.83)**	-1.97
Violent crime rate, 2013	-.07(.05)	-1.42	-.07(.05)	-1.44	-	-	-	-
Property crime rate, 2013	-	-	-	-	.01(.02)	.30	.01(.02)	.31
Staff size change	-4.41(2.92)	-1.51	-4.29(2.94)	-1.46	1.83(1.30)	1.41	1.86(1.3)	1.43
Number of volunteer officers	.03(.01)**	2.55	-	-	.00(.01)	.42	-	-
Ratio of volunteer officers	-	-	-.03(.02)	-1.19	-	-	-.02(.01)*	-1.64
Minority Representation	-.06(.25)	-.23	-.04(.24)	-.16	-.28(.24)	1.15	-.23(.23)	-1.00
Ratio FT officers, other tasks	.04(.05)	.78	.03(.05)	.63	.07(.02)***	2.65	.06(.02)***	2.49
Agency hiring freeze	-.68(.99)	-.68	-.66(1.00)	-.66	-1.31(.56)**	2.34	-1.30(.56)**	-2.31
Agency budget (per capita)	.00(.00)	1.65	.00(.00)	1.48	.00(.00)	.61	.00(.00)	.31
Population (log)	-.70(.40)	-1.73	-.58(.39)	-1.50	-.41(.26)	1.55	-.44(.26)*	-1.71
Population density	-.00(.00)**	-3.34	-.00(.00)***	-3.38	-.00(.00)	-.93	-.00(.00)	-.99
Percentage minority	-.00(.02)	-.25	.00(.02)	-.22	.04(.02)**	2.14	**	2.11
R^2	.68		.68		.67		.67	
N	1068		1068		1080		1080	

* p < .10, ** p <.05, *** p < .01

Table 10. Interaction: External Management and Environment, Total Crimes

Variables	Number of Volunteers		Ratio of volunteers	
	Slope	t	Slope	t
Clearance rate 2012	.82 (.03) ***	27.14	.82 (.03) ***	26.72
Internal Management (M_1)	.75 (1.07)	.70	.79 (1.06)	.75
External Management (M_2)	-1.24 (1.01)	-1.23	-.39 (.96)	-.41
Crime rate 2013	.00 (.01)	.30	.00 (.01)	.34
Interaction with M_2	.00 (.01)	.49	.00 (.01)	.40
Staff size change	1.92 (2.75)	.70	2.25 (2.66)	.85
Interaction with M_2	-.75 (2.99)	-.25	-1.04 (2.88)	-.36
Number of volunteer officers	.03 (.03)	1.22	-	-
Interaction with M_2	-.02 (.03)	-.58	-	-
Ratio of volunteer officers	-	-	.05 (.02) **	2.12
Interaction with M_2	-	-	-.07 (.02) ***	-3.57
Minority Representation	-1.16 (.63) *	-1.84	-1.19 (.61) **	-1.94
Interaction with M_2	1.21 (.53) **	2.29	1.25 (.51) ***	2.48
Ratio of FT officers engaged in other tasks	.01 (.03)	.19	.00 (.03)	.01
Agency implemented hiring freeze	-1.04 (.77)	-1.35	-1.13 (.77)	-1.46
Size of agency budget (per capita)	.00 (.00)	1.10	.00 (.00)	.81
Population (log)	-.67 (.29) **	-2.31	-.62 (.27) **	-2.29
Population density	-.00 (.00)	-1.15	-.00 (.00)	-1.27
Percentage minority	.02 (.02)	1.10	.02 (.02)	1.15
R^2	.68		.68	
N	1119		1119	

* p < .10, ** p <.05, *** p < .01

Table 11. Interaction: External Management and Environment, Violent and Property Crimes

	Violent Crime Clearance				Property Crime Clearance			
	Number of Volunteers		Ratio of Volunteers		Number of Volunteers		Ratio of Volunteers	
Variables	Slope	t	Slope	t	Slope	t	Slope	t
Clearance rate 2012	.78(.03)***	29.10	.78(.03)***	29.09	.86(.03)***	30.37	.86(.03)***	30.38
Internal Management (M_1)	3.74(1.68)**	2.22	3.72(1.68)**	2.21	.13(.89)	.15	.12(.89)	.14
External Management (M_2)	1.60(2.17)	.74	.74(2.21)	0.33	-2.24(1.41)	-1.59	-2.64(1.38)*	-1.91
Violent crime rate, 2013	.10(.09)	1.15	.10(.09)	1.15	-	-	-	-
Interaction with M_2	-.23(.11)**	-2.01	-.23(.12)**	-2.04	-	-	-	-
Property crime rate, 2013	-	-	-	-	-.03(.04)	-.84	-.04(.04)	-.90
Interaction with M_2	-	-	-	-	.05(.04)	1.13	.05(.04)	1.19
Staff size change	-10.2(8.24)	-1.24	-9.98(8.26)	-1.21	3.94(3.93)	1.00	3.96(3.89)	1.02
Interaction with M_2	5.84(9.11)	.64	5.52(9.16)	0.60	-2.15(3.59)	-.60	-2.19(3.55)	-.62
Number of volunteer officers	.05(.02)***	2.62	-	-	.01(.01)	1.28	-	-
Interaction with M_2	-.03(.03)	-.90	-	-	-.02(.01)*	-1.71	-	-
Ratio of volunteer officers	-	-	-.03(.03)	-0.96	-	-	-.02(.02)	-1.64
Interaction with M_2	-	-	.09(.03)***	2.84	-	-	.02(.01)	1.24
Minority Representation	-1.90(1.41)	-1.35	-1.88(1.39)	-1.35	.47(1.23)	.38	.51(1.24)	.41
Interaction with M_2	1.57(1.12)	1.40	1.55(1.10)	1.40	-.64(1.28)	-.50	-.69(1.29)	-.54
Ratio FT officers, other tasks	.03(.05)	.64	.02(.05)	0.51	.06(.02)***	2.61	.06(.02)**	2.55
Agency hiring freeze	-1.22(.96)	-1.27	-1.17(.96)	-1.22	-1.07(.55)**	-1.96	-1.04(.55)*	-1.90
Agency budget (per capita)	.00(.00)	1.38	.00(.00)	1.36	.00(.00)	.06	.00(.00)	.05
Population (log)	-.59(.44)	-1.34	-.69(.47)	-1.50	-.48(.26)*	-1.84	-.52(.28)*	-1.90
Population density	-.00(.00)***	-3.57	-.00(.00)***	-3.65	-.00(.00)	-1.10	-.00(.00)	-1.11
Percentage minority	-.01(.02)	-.52	-.01(.02)	-0.49	.04(.02)**	2.18	.04(.02)**	2.18
R^2	.67		.67		.69		.68	
N	1116		1116		1129		1129	

* p < .10, ** p <.05, *** p < .01

CHAPTER 6

ESSAY 3: CITIZEN MOTIVATIONS TO COPRODUCE

Introduction

As citizens assume a "conjoint responsibility" in jointly producing services alongside government (Sharp 1980: 109), the prior empirical chapters explored why public agencies choose to incorporate citizens in service delivery as well as examine how citizen participation contributes to organizational performance. Without citizen coproduction, governments may not be able to provide services to the fullest extent while citizens may not thoroughly enjoy the benefits of coproduction. Citizen coproduction may occur through government initiatives or by citizens commencing formal activities themselves (Jakobsen 2013; Percy 1978). However, scholars have pointed out that even with government efforts to engage a broader range of citizens, only a small number or a particular set of citizens respond to such initiatives (Van Eijk and Steen 2016). Thus, the question of why citizens coproduce is an important one to address as this allows for governments to design programs that can recruit citizens for coproduction or improve existing programs. But once citizens become involved in coproducing services, a subsequent question becomes why are some citizens more active than others. The task of getting citizens involved in the first place is somewhat different from the task of designing programs that encourage them to be more active. Specifically, the former pertains to matters of advertising and recruitment while the latter concerns issues of long-term sustainability and improvement of existing programs. However, empirical research into this latter aspect of motivations is still limited, and this chapter seeks to address this gap by exploring the factors that influence

coproduction behaviors at different levels of activity using a large-sample survey from a South Korean metropolitan city. This survey contains information about volunteers involved in Citizen Patrols (*Jayool Bhangbeomdae*) registered under police agencies, thereby enabling an investigation of the question of why some citizens are more active than others. Although one might contend that volunteer labor is not consistent with coproduction in the context of users as direct consumers of services, this chapter argues that volunteering in a "formally organized and institutionalized" setting represents a form of coproduction activity where citizens coproduce public services on a collective scale (Pestoff 2014: 386) and which "result in collective goods whose benefits may be enjoyed by the entire community" (Brudney and England 1983: 64). Citizen patrols in the context of South Korea will be discussed in detail later, but this chapter argues that volunteers in citizen patrols can be defined as citizens who "engage in the delivery of services on behalf of other people" (Bovaird and Loeffler 2013: 4).

On the one hand, most recent empirical studies on motivations to coproduce have been conducted in Western settings such as Europe and the United States (i.e. Parrado et al. 2013; Van Eijk and Steen 2014), and the shift in geographic setting to an East Asian country may complicate a precise comparison of coproduction with Western countries. In addition, the culture of collectivism reflected in East Asian countries may display a stronger tendency towards solidary or community motives (Choi and Lee 2016). On the other hand, during the past thirty years, public administration scholarship in Korea has been heavily influenced by Western scholarship, and this is reflected in recent Korean coproduction scholarship as well as government policymaking with respect to incorporating citizens in public service delivery. For instance, scholars have borrowed from topics such as community-oriented policing, social control theory and coproduction to examine alternative policing strategies (Choi 2001; Jung

1994; Kim 1997; Son 2007). From this perspective, this chapter provides an additional contribution to the literature by enabling scholars to garner insight into coproduction processes in a different national and contextual setting.

This chapter is organized as follows. The next section reviews the literature on motivations to coproduce, followed by a description of the empirical setting, data and methods for the current study. Afterwards, the chapter presents the data and findings. The chapter concludes with implications for practice and future research.

The Question of Motives

The coproduction literature draws from several disciplines to explain the motives behind why citizens coproduce. An economic line of argument inspired by public choice theory argues that citizens are driven by self-interest in which they participate if the benefits outweigh the costs (Parks et al. 1981). This suggests that citizens coproduce because of extrinsic or material rewards such as monetary compensation, acquisition of new skills, or non-monetary benefits such as enhanced service levels. Reasons beyond self-interest have been offered for why citizens coproduce as well. In their discussion about the ways to mobilize citizens for coproduction activities, Rosentraub and Sharp (1981) suggest three types of incentives consisting of material, solidary, and expressive motives. Material or extrinsic incentives include tangible benefits such as money and goods or non-tangible benefits such as greater level of services. Solidary incentives entail benefits of associating with others or having a sense of group membership. Finally, expressive incentives are intangible rewards that rely on altruism or a sense of satisfaction. They argue, however, that no single incentive is dominant in any situation but that the most effective type of incentive “depends on the form of coproduction being promoted”

(1981: 535). For instance, material incentives generally apply to individualistic forms of coproduction, whereas collective action relies more on expressive incentives. Solidary incentives can be applied to both types of coproduction.

Volunteerism is a major related stream of research on motivations behind public or non-profit volunteering activities (Brudney 1989; Smith 1994). This stream has generally emphasized the importance of altruistic or egoistic motivations underlying voluntary efforts (Dekker and Halman 2003; Reed and Selbee 2003; Steen 2006). However, while volunteerism can assist in exploring motivations to coproduce, some have noted how volunteers are different from citizens and clients in terms of the benefits they receive (Alford 2002). Volunteers work for the benefits of others, while citizens or clients are often the users of the public services and benefit personally from them, especially in the case of clients. This implies that self-interest is one major motive behind coproductive behaviors. In addition, coproductive interactions occur between citizens and professionals, while classical voluntarism does not always take place in similar professionalized service delivery environments. Alford (2002) expands upon the different motivations behind citizens, volunteers, and clients to coproduce. For instance, citizens' motivations are drawn from the work by Rosentraub and Sharp (1981) described above. Volunteers' motivations are drawn from the volunteering literature such as Clary et al. (1996; 1998) who classify six categories of psychological functions consisting of values, understanding, enhancement, career goals, social and protective motivations. Finally, theory about customer or client motivations comes from the marketing literature to argue that clients are not only driven by material benefits, but also intrinsic rewards such as self-esteem and external sanctions from legal obligations.

Some researchers have cited themes concerning government-citizen relations, citizen participation, and active citizenship that focus on the capacities of individuals to act (Van Eijk

and Steen 2014). As coproduction is a kind of engagement with society, the argument is that there are similarities in the motivations of citizens for engaging in other ways with society. From these literatures, scholars have examined socioeconomic variables (Sharp 1984; Timpone 1998), networks (Amna 2010; Putnam 1993), salience (Pestoff 2012), self-efficacy (Kristensen, Andersen, and Pedersen 2012; Parrado et al. 2013), and trust (Fledderus and Honingh 2016). Salience refers to the importance of the service provided, and the idea is that citizens consider the impact that it has on their life and will determine whether efforts are worth investing in participation. Self-efficacy entails the belief that one's actions can lead to positive results. Internal efficacy points to an individual's perceptions about his or her competencies to understand and to engage effectively in order to produce positive results, while external efficacy concerns the belief in which one's actions can potentially influence decision-making and service provision by governmental authorities and institutions. Finally, trust is another factor. If citizens perceive government to adequately delivers services and provide opportunities to meaningfully engage, levels of trust are likely to be enhanced. Meanwhile, trust can also be linked with government performance (Parrado et al. 2013). This is generally considered a positive factor and is both a consequence and determinant of government performance (Van Ryzin 2007; 2011). Greater trust means that citizens are satisfied with government service provision, while greater distrust is reflective of poor government performance, which can incentivize citizens to resort to alternative service delivery arrangements such as coproduction. For instance, policing studies have argued how communities with large African-American populations tend to be less satisfied with police services and so they are more likely to pursue police reforms and be more willing to engage in community initiatives (Wehrman and Angelis 2011).

Van Eijk and Steen (2014) point out that the concept of public service motivation (PSM) also has the potential to contribute to an understanding of citizens' motivations for coproduction due to its relation to community-centered motivations. Since the concept focuses on motivations grounded in the public interest, or "an individual's predisposition to respond to motives grounded primarily or uniquely in public institutions and organizations" (Perry and Wise 1990: 368), scholars have used PSM to analyze public sector employees' participation not only in official duties as formal employees but also in informal civic activities (Brewer 2003; Pandey et al. 2008; Perry and Hondeghem 2008). The PSM literature has developed a significant amount of research concerning the motivation of public servants, but such research has not been extensively applied to the public service motivation of citizen coproducers. Nonetheless, recent scholars such as Van Eijk and Steen (2014: 362; 2016) have discussed PSM as "community-oriented, pro-social" behaviors which enable citizens to assume greater responsibilities in the public domain.

In addition to individual motivations, conditions can either facilitate or hinder coproduction (Verschuere, Brandsen and Pestoff 2012). These include transaction costs, such as ease of involvement, and level of salience, such as perceptions of crime that prompt citizens to participate (Pestoff 2012). In many cases these are necessary conditions in which, before motivations are put into practice, attention should be paid to the possibility of becoming involved in the first place. If citizens do not perceive coproduction to be easy enough or if the activity is deemed unimportant, they will not consider participating.

In short, the literature provides information on several common factors that assist in explaining individuals' motivations to engage in coproduction including intrinsic and extrinsic, expressive, solidary, and PSM related values, as well as salience and self-efficacy. In addition, capacity relates to both human capital, such as income and education, and social capital, such as

belonging to a network. In turn, human and social capital can be expected to influence how citizens determine the salience of engagement and to judge their level of efficacy concerning participation.

Motivations to Coproduce in Public Safety

Prior studies concerning citizen motivations to coproduce in public safety have identified variables such as fear of crime, perception of victimization, and prior experience with crime to be associated with a greater tendency to engage in coproduction (Percy 1987; Rosentraub and Sharp 1981; Rosentraub and Harlow 1983; Rosentraub and Warren 1987). These studies have tended to measure individual coproduction activities such as installing alarms or locks, purchasing personal safety weapons, installing property identification signs, and attending meetings. Studies exploring largescale volunteering in public safety organizations examine several factors pertaining to socio-economic and demographic factors that affect individuals to volunteer in general (Ferris 1988; Siegel and Sundeen 1986; Sundeen 1988). Meanwhile, citizen patrols have been identified as a type of group or organized coproduction activity where citizens cooperate directly with police agencies to engage in patrol or other crime prevention activities (Percy 1978). The recent coproduction literature has tended to overlook this type of coproduction activity, which may be due to the fact that volunteers in such organized capacities are not direct users of services. However, some argue that a citizen does not necessarily have to be a direct recipient of a service to coproduce and that individuals can engage in service delivery on behalf of others (Bovaird and Loeffler 2013; Brandsen and Honingh 2015). Prior studies have discussed how collective coproduction includes institutionalized programs that involve citizen volunteers (Brudney and England 1983). In particular, Brudney (1984) argues how the systematic

incorporation of large numbers of trained citizens into the service bureaucracy as part of the regular public workforce has the potential to decrease service expenditures as well as improve service effectiveness. Empirical studies on motives to coproduce public safety in such organized capacities are limited, but recent studies on volunteer law enforcement officers which is a similar form of organized coproduction to citizen patrols discuss how individuals may volunteer for different reasons. Ren et al. (2006) find that gender, perceptions of crime, and political orientations are major predictors of participation in police volunteer work. Wolf, Holmes and Jones (2016) identify three major subgroups of volunteers in policing programs consisting of those who wish to gain the training and experience necessary to apply for full-time positions, retired officers who continue to maintain a presence in the organization, and individuals who view volunteer policing as an avenue of community service. While this provides information about the characteristics of who volunteers for law enforcement work, research is limited on what drives these individuals to be more active than others within these organized capacities.

Voluntary Citizen Patrols in South Korea

In South Korea, citizen patrols represent an important form of collective coproduction activity (Chun 2005; Lee 2001; Lee and Kim 2005; Lee and Hwang 2009; Lee 2012). On the one hand, while the differential geographic setting complicates a precise comparison of coproduction with Western nations, during the past thirty years, public administration scholarship in Korea has been heavily influenced by the United States. This has impacted recent coproduction scholarship as well as government policymaking with respect to incorporating citizens in public service delivery. Scholars have borrowed from topics such as Community-Oriented Policing, Social Control Theory and Coproduction to examine alternative policing strategies (Choi 2001; Jung

1994; Kim 1997; Son 2007). Furthermore, the heated debates during the recent 17th (2004-2008), 18th (2008-2012), and 19th (2012-2016) National Assembly sessions concerning the Voluntary Citizen Patrol Bill, as well as the adoption of local Citizen Patrol ordinances by more than 90 municipalities across the country, attests to the increasing challenges and opportunities to manage volunteer citizen patrol organizations.

In 2012, it was estimated that there were about 3,917 citizen patrol organizations with 100,517 active members (Min 2014). Beginning in 2009, local governments across the country instituted ordinances to provide funding and other assistance for voluntary crime prevention activities, and as of 2015 more than 90 municipalities have some form of regulation in place.[22] Table 12 shows the number of citizen patrol organizations, volunteers and the amount of local government funding according to major metropolitan city or province in 2012. Table 13 illustrates the contribution of citizen patrols' activities to law enforcement performance. The figures demonstrate the extent to which citizens are assisting police agencies in contributing to public safety.

The origins of citizen patrols date back to the aftermath of the Korean War in which local residents were mobilized to supplement regular police forces in subduing communist insurgents (Oh 2000). Afterwards, for several decades, citizen patrols continued to exist in various forms throughout different localities to serve the purpose of crime prevention. Due to the lack of centralized management or support, however, there was lack of comprehensive data on their numbers or their exact form of organization. It was not until the South Korean government's "War Against Crime" policy in 1990 that advocates raised the need for more effective management of citizen-participatory crime prevention groups, and in 1996 the Korea National

[22] Enhanced Local Laws and Regulations Information System (ELIS). <http://www.elis.go.kr/>

Police Agency issued the Voluntary Crime Prevention Patrol Guidelines (*Jayul Bhangbeomdae Gwali Jichim*) to formalize the management and operation of voluntary patrols within police organizations (Hwang 2011). At present, each of the provincial police headquarters maintain Voluntary Crime Prevention Patrol directives that contain guidelines on the organization of citizen patrols, mission and tasks, recruitment and dismissal, training and education, uniforms and equipment, and rewards or incentives. In addition, beginning in 2009 municipalities across the country began enacting local regulations to manage citizen patrol organizations. Alongside patrolling of high crime risk areas, citizen patrols engage in various types of activities such as teen delinquency prevention, monitoring of infractions such as littering or public intoxication, assisting in traffic control, snow removal and street maintenance.

It is within this context that this chapter examines citizens' motivations to volunteer in Citizen Patrols. One point to consider is that this unique geographic setting may render it difficult to directly apply the prior mentioned theories on coproductive motivations. In particular, Choi and Lee (2016) find that citizen participation in community safety in South Korea is largely driven by community values such as social harmony and cohesion based on the culture of collectivism reflected in East Asian countries. From this perspective, we initially expect to find a greater disposition towards solidary or community motives rather than individual or personal reasons for volunteering. While this assumption may hold true in general, however, this tendency may be intensified due to social desirability bias in which individuals in collectivistic societies answer in a more socially desirable manner that overemphasize the solidary aspects of participation (Kim and Kim 2016). Nonetheless, in practice individual motives may operate at different levels of activity. For instance, those who participate more frequently than others may do so for other reasons such as being a prior victim of crime or retaining a greater desire to

contribute to public safety. But these motivations may not be readily apparent in self-reported measures, and so the empirical section proceeds to explore these underlying motivations through the analysis of coproduction behaviors operating at different levels.

Data and Measures

To examine the question of why some citizens coproduce more actively than others, data are derived from the *Survey of Local Resident Participation in Citizen Patrol Units* administered by the Korean Institute of Criminology, a government research institute, and are available from the Korean Social Science Data Archives (KOSSDA).[23] The survey contains a variety of questions about the status of citizens' participation in local voluntary citizen patrol units. In addition, demographic information such as gender, age, level of education, marital status, number of children, income, type of residence, type of neighborhood, length of residence, and occupation is included. This is a one-time cross-sectional survey conducted in 2005 and administered in the city of Seoul. Since the citizen patrol units are formally registered under police departments, surveys were distributed using a convenience sampling method to the 31 police departments within Seoul. The unit of analysis is at the individual level, and respondents' characteristics consist of citizens who are existing members of citizen patrol units. The final sample size is 450.[24]

Concerning the dependent variable, the survey contains a question that asks respondents about the degree of participation. Specifically, it measures the frequency of engaging in patrol

[23] <http://www.kossda.or.kr/eng/index_kossda.asp>

[24] The survey's methodology section did not include information on a response rate, as the surveys were distributed using a convenience sampling method to all police stations within Seoul. Therefore, sampling bias may be inherent in the data, as the respondents were not gathered from a random sample. The author contacted the institute responsible for administering the survey, but was unsuccessful in corresponding with the original researcher.

activities on average, and response categories include: *less than once a month, once a month, once every 15 days, once a week, twice a week, and every day (*coded from 1= *less than once a month* to 6= *every day)*. This measures a coproduction behavior and is not tied to specific perceptions, meaning it is not a perceptual outcome measure and so the potential for common source bias is lower (Meier and O'Toole 2013). Since the measure is ordinal in nature, ordered logit regression is used to estimate the model. The structural model for an ordered logit (or proportional odds model) is specified by the following equation:

$$Y*_i = \sum_{k=1}^{K} \beta_k X_{ki} + \varepsilon_i$$

The model can be expressed in terms of probabilities as follows:

$$\mathrm{P}rob(Y_i = j) = \frac{e^{\chi_i \beta - \mathrm{K}_{j-1}}}{1 + e^{\chi_i \beta - \mathrm{K}_{j-1}}}$$

Where $Prob(Y_i = j)$ is the probability that individual *i* will select alternative j, χ_i is the vector of questions exploring motivations, and K_{j-1} indicates the response thresholds. Since the respondents are citizens who are formally involved in an organized coproduction activity, the six categories measuring the frequency of participation allow for an investigation of different motives operating at different levels.

Based on prior literatures concerning citizen motivations, the independent variables are selected from questions that garner information about the following motivational categories: material, expressive, solidary, PSM, self-efficacy, salience, and satisfaction with government performance. Capacity is reflected in the control variables.

First, pertaining to the underlying motives for participating in citizen patrols, the survey asks: "What is the initial reason that you became involved in citizen patrols?" Four sub-items

that tap into these motivations are selected: (1) to protect the physical safety of myself and family members (material); (2) to socialize with local residents (solidary); (3) to ensure the safety of my community (expressive); and (4) assist local police activities (PSM). Response categories for each of these sub-items include: *strongly disagree, somewhat disagree, agree on average,* and *strongly agree* (coded 1= *completely disagree* to 4= *strongly agree*). 'Ensuring community safety' may have some overlap with PSM, but is categorized as an expressive motive since 'to assist local police activities' is a more specific item tied to the activities of assisting police agencies.

Second, in terms of measuring self-efficacy, the survey asks: "What kind of influence do you expect the citizen patrol activities have in your community?" The following two sub-items are selected: (1) decrease in community crimes; (2) improved relationship between community residents and the police. For each of these sub-indexes, response categories include: *strongly disagree, somewhat disagree, agree on average,* and *strongly agree* (coded 1= *completely disagree* to 4= *highly agree*).

Third, in terms of the conditions that affect the level of salience for citizens, the survey asks: "Please rate the degree of severity of crime problems in our country." Response categories are: *not severe at all, somewhat severe, average, moderately severe,* and *very severe* (coded from 1= *not severe at all* to 5= *very severe*). Another question includes: "Have you been a victim of crime during the past 2 years?" (coded 1 = *yes;* 0 = *no*). These two questions relate to the salience of becoming involved in citizen patrols.

Fourth, the survey contains a question pertaining to satisfaction/dissatisfaction with government performance, which asks: "Do you think police activities are sufficient to prevent crime?" Response categories are: *not sufficient at all, somewhat sufficient, moderately sufficient,*

and highly sufficient (coded from 1= *very insufficient* to 4= *highly sufficient*). In some ways, this taps into the level of citizen trust in police performance.

Finally, coproduction behaviors will vary by demographic and socio-economic factors that affect individual capacities to participate. The analysis includes information about age, level of education, presence of children (1=*yes*; 0=*no*), home ownership, and length of residence. Other key control variables such as crime rates are not included because these are unavailable at the district (*Gu*) level in which police departments are located. Crime rate is only available on an aggregated basis for the city of Seoul. Gender is also excluded from the analysis as nearly 94 percentage of respondents were male.

Empirical Results

The numbers in the descriptive statistics in Table 14 are relative frequencies based on Likert scales for each of the variables. Prior to conducting the ordered logit regression analysis, we first examine the descriptive responses to each of the survey measures for a better understanding of the attitudes of citizen patrol members and to compare with the ordered logit results afterwards. First, a breakdown of the frequency of volunteering in shows that nearly 70 percentage of members responded that they engaged in citizen patrol activities at least more than once a week (Table 15).

The survey contains a separate question that asks what is the single *main* reason for being currently active in citizen patrols (Table 16). This is a different question from the sub-items containing Likert scales about the variations in frequency of involvement in citizen patrols. Among the respondents, around 50 percent stated they are active because they like to socialize with other patrol members, while nearly 21 percentage answered they got to know other local

residents and police better. Only about 10 percentage stated they participate for reasons concerning community safety, and 7 percentage said they volunteered for general reasons. In short, nearly 70 percentage of respondents answered that they are actively involved for solidary reasons, suggesting that solidary motives play a major role in participation in citizen patrols in South Korea. However, their statement about why they are active is a self-reported perceptual measure and is not reflective of coproduction behavior. The regression analysis which will be conducted below is what connects such motivations with actual behaviors.

Meanwhile, about 76 percentage of members responded that they think crime problems are either *moderately severe* to *very severe* (Table 17), while nearly 70 percentage of respondents felt that police activities were either *somewhat insufficient* or *very insufficient* to prevent crime (Table 18). However, only 12 percentage said that they were a victim of crime during the past two years (Table 19). The responses from these three tables suggest that perceptions of crime have more influence than do actual experience with crime victimization. Finally, in terms of the demographic variables, the average age is about 46 years old, average education level is high school graduate, majority of members have children, most members own homes, and the duration of residence is about 15 years.

For the ordered logit regression, to reiterate, the dependent variable concerns the frequency of participating more or less actively in citizen patrol activities. The ordered logit assumes that all of the coefficients on the independent variables are equal for every category of the dependent variable and that the slopes of the estimated equations are identical. This is referred to as the proportional odds (parallel equation) assumption and can be tested using a Brant's test or a likelihood ratio test. The test found a nonsignificant p-value, meaning that the proportional odds assumption has not been violated. Table 20 reports the results of the frequency

of participation ranging from 1=*less than once a month* to 6=*every day*. Because the estimated coefficients cannot be interpreted in the same manner as linear regression results, the percentage change in odds ratios are also reported for each of the independent variables. A higher percentage change in the odds ratios indicates a higher likelihood of the independent variable being associated with higher scores on the 1 to 6 categorical scale of response substance. As mentioned before, the predictors explore the following motivations consisting of solidary, material, intrinsic, expressive, and PSM motives; self-efficacy; salience; and satisfaction with government performance.

First, concerning primary incentives such as solidary, material, expressive and PSM motives, the item for *to ensure community safety* is statistically significant, and indicates that a one-unit increase in this scale increases the odds of participating more frequently by 44.89 percentage points ($p<.05$). This finding contrasts with the self-reported responses in Table 15 which show that more than 70 percentage stated they are currently active in citizen patrols for solidary reasons. Rather, the ordered logit estimates reveal that expressive benefits such as the desire for greater community safety underlie motivations for greater frequency of participation. Also, *assisting in local police activities* is statistically significant, but the decrease in the odds ratio by 17.89 percent shows that PSM is less of a driver for greater frequency of participation. However, this is not to devalue the importance of PSM as a critical incentive for engaging in public service, but rather suggests that greater frequency may be related to dissatisfaction with formal police activities and that it may be a result of a desire to invest more personal efforts to enhance service quality.

In terms of self-efficacy, the expectation for *decrease in community crimes* indicates that a one-unit increase in this self-efficacy scale increases the odds of greater frequency of

participation by 103.61 percentage points, whereas *improved relationship between residents and police* reveals a one-unit increase in this self-efficacy scale decreases the odds of greater frequency of participation by 19.61 percentage points. These results suggest that more active participation is associated with the expectation that participants' actions will result in enhanced service qualities such as improved community safety rather than solidary benefits.

Meanwhile, concerning crime conditions, the *degree of severity of crimes* shows that a one-unit increase in this scale increases the odds of greater frequency of participation by 23.64 percentage pointes, suggesting that salience is a pertinent motivation for active participation. However, being a victim of crime during the past two years is not statistically significant, confirming the assumption that perceptions about crime is more relevant to participation than actual experience with crime.

Finally, among the statistically significant control variables, the *presence of children* shows a decrease in the odds ratio by 73.52 percentage points, suggesting that having children acts as a constraint which decreases the likelihood that members spend in citizen patrols. However, *homeownership* and *duration of residence* reveal an increase in the odds ratio by 29.38 and 2.84 percentage pointes, respectively, indicating that as homeownership rises and the longer duration of residence in a community, the higher likelihood of participating more frequently in citizen patrol duties.

While the ordered logit regression uses the ordered nature of the dependent variable to derive a single effect for each of the independent variables, thereby simplifying the model, there is the possibility that the constraints may vary according to the individual responses since the ordinal categories consist of arbitrary cutoffs and are not spaced equally. To account for this limitation, the marginal effects are reported in Table 21 for each of the six categories of the

dependent variable to examine the changes in probabilities when the independent variables increase by one unit.

The marginal effects confirm the ordered logit results in that lower categories (i.e. 1,2, and 3) display opposite effects from that of higher categories (5 and 6). For example, for the variable *to ensure community safety*, the changes in probability for those who participate less frequently in citizen patrols (2 and 3) reveal a decrease in percentage points by 0.03 and 0.041, respectively, whereas those who are more active (5 and 6) experience an increase in percentage points by 0.058 and 0.012. For the variable *assist in local police activities*, the changes in probability for those who participate less frequently in citizen patrols (2 and 3) display an increase in percentage points by 0.016 and 0.022, compared to the decrease in percentage points by 0.031 for those who are more active (5). These relationships hold constant for the other statistically significant variables including *decrease in community crimes, improved relationships between residents and police, degree of severity of crime, presence of children, homeownership,* and *duration of residence*.

Discussion and Conclusion

This chapter explores the question of why some citizens coproduce more actively than others using empirical data containing information about citizens involved in a collective coproduction activity. The results of the ordered logit regression enable an empirical analysis of motivations that operate at different degrees, or frequency, of participation in citizen patrol activities.

Concerning several key incentives such as material, solidary or expressive motives behind participation, *expressive* motives are closely associated with greater frequency of

participation. Originally from the self-reported question that asks what is the single main motivation for being active, an overwhelming proportion of respondents had stated that the main reason for being active in citizen patrols consisted of socializing with patrol members and other members of the community and police. However, the ordered logit results indicate that greater frequency of participation is explained by expressive motives such as contributing to greater community safety. In addition, from the self-efficacy category, the results suggest that the belief that their involvement can lead to a reduction in community crimes explains greater frequency of participation. From the community conditions category, as perceptions about the severity of crime increase, citizens are more active. These three findings indicate that greater frequency of engaging in coproduction is largely driven by motives that pertain to expressive motives in terms of enhanced service levels rather than solidary motives such as socializing with others. This means that citizens who are more active in coproduction are driven by a desire that focuses on the core of the service itself, that is, to improve public safety. In the context of social desirability bias, this is an important finding that shows how individuals in collectivist societies are more likely to engage in socially desirable responses, whereas the underlying motivations driving actual behaviors may be quite different.

However, this is not to devalue the importance of solidary incentives. Greater frequency of coproduction behavior may be contingent upon the desire to achieve expressive benefits, but as observed from the self-reported measure about the main reason for being currently active, motivations are mutually supportive in that solidary motives could act as a key preservation force for expressive motives, particularly if an organization consists of a volunteer workforce. If members do not support each other through solidary mechanisms and some feel left out or there

is conflict among members, then expressive benefits alone cannot sustain organizational involvement in the long term.

Meanwhile, assisting in local police activities which reflects PSM is associated with less frequency in participation. However, this is not to say that PSM is less of an incentive for those who participate more frequently in public services. Rather, viewed from the perspective of dissatisfaction with current police activities, whether it be based on subjective or actual perceptions about police services, this dissatisfaction might actually be a reflection of an increase in PSM if we interpret this as influencing individuals' desire to invest greater personal efforts to enhance service quality rather than rely solely on police activities. Initially, PSM was linked with *assisting in local police activities* since it is tied to a more specific task of contributing to local police efforts. But as mentioned before, there is significant overlap between PSM and expressive motives on the grounds that both *ensuring community safety* and *assisting in local police activities* contain elements of working towards the public interest and generally involve collective action. Future research could address this issue by devising measures that more clearly distinguish between these nuances among motivations.

Examining the concept of *salience* in more detail, from the self-efficacy category, citizens who believe that participation can lead to a decrease in community crimes display a greater frequency of participation. In addition, from the community conditions category, those who perceive crime problems to be more severe are more likely to engage more frequently. This attests to the role of perceptions about crime rather than actual experience with crime victimization in motivating citizens to actively participate. It confirms the notion that salience of the service is a significant motivating factor, and more broadly, suggests the importance of

information distribution and raising awareness about how citizen input matters (Thomsen and Jakobsen 2015).

Finally, the significance of several control variables such as the presence of children, homeownership, and duration of residence confirm prior studies about volunteering in general. The results indicate that the presence of children can function as a constraint which increases the opportunity cost of time, and therefore citizens having children will be less prone to participate more actively. Meanwhile, homeownership and duration of residence confirms notions about social cohesion and stability. Low levels of mobility can instill a sense of attachment and enhance social cohesion, providing an incentive to be involved in community affairs and to volunteer in coproduction initiatives (Marschall 2004). The results of this study provide further indication that community cohesion and stability can increase the degree to which citizens participate more actively.

Several methodological shortcomings require mentioning. One limitation is that the results are confined to the realm of law enforcement and public safety, and so one should be cautious in generalizing the results to other service domains. For example, due to the high-risk nature of law enforcement services, the majority of citizen patrol members consist of males, whereas other public programs or services such as childcare or domestic violence prevention may target women. In addition, since the responses are derived from members of organized citizen patrols, non-participants are not included so that the responses may be biased in a certain direction. For instance, participants may be driven by certain types of motivations unique to citizen patrols. Second, the study is conducted in a non-Western setting, limiting the scope of findings to South Korea, and in particular, to a single metropolitan city. In particular, the cultural tendency towards collective values is an important point to keep in mind when studying

motivations to participate in the public realm. Third, citizen patrol consists of an organized activity that is different from more individual forms of coproduction where users directly consume the services, and individuals in such capacities may participate for different underlying reasons. Meanwhile, one may point out the problem of common source bias which is caused by two variables displaying measurement error due to a common method such as being derived from a single survey (Favero and Bullock 2015). However, the dependent variable is not a perceptual measure but rather reported behavior (frequency) concerning respondents' volunteer activities. Recall bias could still constitute an issue, but as long as performance is not an entirely subjective measure, then common source bias constitutes less of an issue for this study.

Overall, the benefit of an international study is that it applies the same theories and research questions on motivation to coproduce in a different setting, broadening our understanding of how coproduction functions and varies across national contexts. If supported by additional research, these implications can provide valuable information for public managers in terms of distinguishing between different managerial strategies for recruiting citizens to coproduce as well as the retention, coordination, and supervision of those who are actively involved in organized coproduction programs. In particular, the fact that those who are more active in the organization tend to be driven by a desire to improve service quality (i.e. enhancing community safety) provides crucial information for managers to use. Getting citizens involved in the first place is an important task in and of itself. However, once citizens are recruited and become involved more actively in coproducing a service, the managerial activities of designing programs that prompt citizens to be more active and to retain them in the long run may require different organizational objectives and incentives. In particular, these management activities pertain to issues of long-term sustainability and continuous innovation of existing programs. But

motivations are mutually supportive, and even if greater frequency of participation is closely linked with tangible benefits, solidary and other motivations must be considered in tandem in order to sustain coproduction activities in the long run. Future research could build upon these points by exploring motivations behind active citizen participation in other forms of coproducing public safety, in other countries, and/or other policy domains so that different managerial strategies can be tailored to different forms of coproduction.

Table 12. Status of Voluntary Citizen Patrol Organizations

City / Province	Number of Organizations	Number of Volunteers	Local Govt. funding (in dollars)	Ratio of funds to Total
Total	3,917	100,517	12,384,518	100%
Seoul*	450	10,995	1,189,478	9.60%
Busan*	244	4,562	113,658	0.92%
Daegu*	175	4,238	41,200	0.33%
Inchon*	122	2,968	40,069	1.13%
Gwangju*	66	1,222	11,143	0.09%
Daejeon*	144	2,692	46,262	0.37%
Ulsan*	68	2,183	208,099	1.68%
Kyeonggi[25]	518	15,819	2,764,563	22.32%
Kangwon	241	7,537	1,595,382	12.88%
Chungbuk	181	4,835	850,163	6.86%
Chungnam	392	9,396	1,337,162	10.80%
Cheonbuk	287	8,587	1,019,229	8.23%
Cheonnam	307	7,133	1,062,298	8.58%
Kyeongbuk	351	8,824	1,134,418	9.16%
Kyeongnam	347	8,785	868,348	7.01%
Chaeju	24	741	3,048	0.02%

Source: Adapted from Min (2014) As of Sep. 2012

* Metropolitan city

Table 13. Contribution of Voluntary Citizen Patrols to Police Performance

Region	Criminal Apprehensions					Custody		Reporting of Crime
	Total	Violent	Burglary	Assault	Other	Incidents	Persons	
Total	614	0	10	147	457	7,304	9,883	5,854
Seoul*	6	0	2	0	4	175	191	196
Busan*	12	0	1	2	9	114	153	123
Daegu*	14	0	1	0	13	45	80	42
Inchon*	3	0	1	1	1	13	21	44
Gwangju*	45	0	1	24	20	51	73	46
Daejeon*	1	0	1	0	0	8	8	2
Ulsan*	1	0	0	0	1	94	115	139
Kyeonggi	324	0	1	118	205	5,500	7,147	4,106
Kangwon	2	0	0	0	2	34	54	1
Chungbuk	2	0	1	0	1	235	164	4
Chungnam	0	0	0	0	0	3	3	14
Cheonbuk	23	0	0	2	21	38	92	82
Cheonnam	1	0	0	0	1	67	128	66
Kyeongbuk	13	0	0	0	13	615	881	277
Kyeongnam	167	0	1	0	166	306	756	707
Chaeju	0	0	0	0	0	6	17	5

Source: Adapted from Min (2014). As of Sep. 2012

* Metropolitan city

[25] The overwhelming proportion of funds devoted to Kyeonggi province is due to region's population figures at 13 million (as of 2015), which is approximately one fourth of the entire Korean population.

Table 14. Descriptive Statistics

Variables	Min	Median	Mean	Max	Std Dev
Frequency of participation in patrol activities	0	4	3.83	6	1.12
Number of hours spent during single patrol activity	1	3	2.94	5	0.91
Reasons for participation in citizen patrols					
Socialize with local residents	1	3	2.76	9	0.79
Maintain the safety of my community	1	3	3.37	9	0.68
Assist local police activities	1	3	3.04	9	0.84
Self-efficacy (impact of participation)					
Decrease in community crimes	1	3	2.93	4	0.64
Improved relationship between residents and police	1	3	2.64	9	0.75
Community Conditions					
Degree of severity of crimes	1	4	3.83	5	0.86
Victim of crime during past 2 years	1	1	1.12	2	0.33
Satisfaction with police activities in preventing crime?	1	2	2.22	4	0.69
Controls					
Age	26	46	46.46	66	6.67
Level of education	1	3	3.20	9	0.93
Presence of children	1	2	1.95	2	0.22
Type of residence	1	1	1.50	9	0.79
Duration of residence (in years)	0	15	15.85	58	10.03

Table 15. Frequency of Participation in Citizen Patrol Activities

Frequency	Percentage*
Every day	4%
Twice a week	23%
Once a week	41%
Once every 15 days	18%
Once a month	11%
Less than once a month	1%
Don’t know / no response	1%

* Responses were rounded to remove decimals

Table 16. Main Reason for Being Currently Active in Citizen Patrols

Reasoning	Percentage
Like to socialize with other patrol members	50.23%
For the sake of doing so (reluctantly)	4.11%
Became more acquainted with other local residents and police	21.46%
Receive associated benefits (i.e. exemption from reserve training)	0.23%
General sense of volunteering	7.76%
Maintain community safety	10.96%
Address teen delinquency	0.23%
Something I wanted to do (positive willingness)	0.68%
Social commitment / responsibility	0.91%
Other	3.42%
Total number of respondents	438

Table 17. Severity of Crime Problems

Response scale	Percentage
Not severe at all	1%
Somewhat severe	8%
Average	15%
Moderately severe	58%
Very severe	18%
Total number of respondents	450

* Responses were rounded to remove decimals

Table 18. Satisfaction with Police Activities in Preventing Crime

Response scale	Percentage
Not sufficient at all	11%
Somewhat sufficient	59%
Moderately sufficient	26%
Highly sufficient	4%
Total number of respondents	450

* Responses were rounded to remove decimals

Table 19. Victim of Crime During Past 2 Years

Response scale	Percentage
Yes	12%
No	88%
Total number of respondents	450

* Responses were rounded to remove decimals

Table 20. Ordered Logistic Regression of Frequency of Participation in Citizen Patrols

Variables	Coefficient (Robust SE)	% Δ Odds Ratio
Material, Solidary, Expressive, and PSM		
To protect myself and family members	0.15(0.26)	-4.03
To socialize with local residents	-0.07(0.13)	-10.52
To ensure community safety	0.29(0.22) **	44.89
To assist local police activities	-0.21(0.12) *	-17.89
Self-efficacy (impact of participation)		
Decrease in community crimes	0.46(0.21) ***	103.61
Improved relationship between residents and police	-0.26(0.13) **	-19.61
Community Conditions		
Degree of severity of crimes	0.21(0.10) **	23.64
Victim of crime during past 2 years (1=yes; 0=no)	-0.29(0.28)	-28.61
Satisfaction with police activities in preventing crime	0.16(0.15)	18.46
Controls		
Age	-0.02(0.02)	-1.96
Level of education	-0.05(0.09)	-5.66
Presence of children (1=yes; 0=no)	-1.35(0.48) ***	-73.52
Homeownership	0.24(0.12) **	29.38
Duration of residence (in years)	0.03(0.01) ***	2.84

Wald chi-square = 70.45; N = 449; R-square = 0.05
*p<0.1, **p<0.05, ***p<0.01

Table 21. Marginal Effects

Participation in citizen patrols: 1=less than once a month; 2=once a month; 3=once every 15 days; 4=once a week; 5=twice a week; 6=every day						
Variables	Response Categories					
	1	2	3	4	5	6
Reasons for participation in citizen patrols						
To protect myself and family members	0.000	0.003	0.005	-0.001	-0.006	-0.001
To socialize with local residents	0.001	0.009	0.012	-0.002	-0.018	-0.003
To ensure community safety	-0.004	**-0.030**	**-0.041**	0.008	**0.058**	**0.012**
To assist local police activities	0.002	**0.016**	**0.022**	-0.004	**-0.031**	-0.006
Self-efficacy (impact of participation)						
Decrease in community crimes	**-0.007**	**-0.058**	**-0.078**	0.014	**0.112**	**0.022**
Improved resident/police relationship	0.002	**0.018**	**0.024**	-0.004	**-0.034**	**-0.007**
Community Conditions						
Degree of severity of crimes	**-0.002**	**-0.017**	**-0.023**	0.004	**0.033**	**0.007**
Victim of crime during past 2 years	0.004	0.027	0.037	-0.007	-0.053	-0.010
Satisfied with police in preventing crime	-0.002	-0.014	-0.019	0.003	0.027	0.005
Controls						
Age	0.000	0.002	0.002	0.000	-0.003	-0.001
Level of education	0.001	0.005	0.006	-0.001	-0.009	-0.002
Presence of children	**0.014**	**0.108**	**0.146**	-0.027	**-0.209**	**-0.041**
Homeownership	**-0.003**	**-0.021**	**-0.028**	0.005	**0.041**	**0.008**
Duration of residence (in years)	**0.000**	**-0.002**	**-0.003**	0.001	**0.004**	**0.001**

CHAPTER 7

CONCLUSION

Interest in the active involvement of citizens in public service delivery has been gaining further momentum during the past decade and attests to the potential for further research into this topic (Jakobsen et al. 2016). An increasing number of scholars have been engaging in empirical testing and theory development using large-N data. However, there are many questions that need to be addressed, and scholars have been emphasizing the need for further empirical investigation on topics concerning coproduction arrangements, the effects of coproduction, coproduction behaviors and attitudes, and others. Analysis of large-N data is desirable since much of existing empirical studies on coproduction have consisted largely of case studies that lack generalizability. This dissertation contributes to the literature by engaging in empirical testing of several coproduction propositions. The analyses explore three major questions using a large-N law enforcement dataset from the United States as well as a survey on citizen volunteers in public safety from South Korea. The hope is that the results will shed more empirical light on coproduction dynamics and contribute to coproduction theory development.

Summary of Findings: Determinants of Coproduction

The first empirical analysis examined how demand and supply factors derived from various theories and concepts such as public management, government failure, interdependence theory and social cohesion affect local law enforcement agencies' decisions to utilize volunteers for police services. Overall, the findings indicate that in terms of the likelihood of using

volunteers, the form of government, fiscal constraint, union strength, community policing, community wealth, racial composition, unemployment, median household income, and population are statistically significant. In terms of the degree of volunteer usage, the form of government, tax burden, agency budget size, community policing, community wealth, racial composition, unemployment, median household income, certain age groups, and population are significant in affecting the degree of volunteer usage. These findings have important implications for public management and policy.

From the demand side, council-manager form of government is significantly related to both the decision of whether to employ volunteers and the degree to which volunteers should be utilized. While it is difficult to ascertain in what way this form of government directly influences the decision-making of the heads of police organizations, it might be that police agencies are influenced by the institutional setting of their respective jurisdictions. That is, local governments' decision to adopt alternative service delivery arrangements may influence law enforcement agencies' decisions to resort to using alternative manpower resources such as volunteers. Meanwhile, the tax burden is significant in both the logit and tobit analyses, but the effect is the opposite of what was hypothesized about the relationship between fiscal constraints and utilizing volunteers. That is, the results show that police agencies located in jurisdictions with higher tax burdens are less likely to utilize volunteers for law enforcement duties. Prior coproduction studies have suggested that one of the incentives to resort to coproduction is to save costs (Brudney 1983; Ferris 1988; Percy 1984), suggesting that the use of volunteers could lead to a net decrease in expenditures. However, scholars acknowledge how managing and coordinating volunteer programs may require additional resources (Brudney and Kellough 2000; Fisher and Cole 1993; McCurley and Lynch 1996). One may argue that jurisdictions with lower tax burdens

might use volunteers to expand services without raising taxes, assuming they have smaller budgets. But since these governments have fewer resources, volunteer programs could impose a burden on organizations, resulting in less effective volunteer utilization. However, we do not know with certainty about the role of expenditures or savings without further information about the administrative costs required to recruit, train and deploy volunteer officers. This is the subject of future research that explores in cost-benefit analyses. Union strength was found to be associated with both a lower likelihood and degree of using volunteer officers. The results suggest that union opposition poses a significant hurdle regarding the decision to utilize volunteers, and also the extent to which they are utilized.

Meanwhile, the significant and positive influence of community policing in both the logit and tobit analyses confirms the hypothesis that community policing should have a positive effect on coproduction by generating an environment which makes it more favorable for citizens to coproduce. Overall 43% of agencies responded that they implemented both community policing and volunteer officer programs at the same time, and the results lend further support. The goal of community policing is on forging partnerships and promoting better police-community relations, and the use of volunteer officers may be part of overall community policing efforts.

Concerning the supply factors, examining the likelihood of using volunteer officers, the findings reveal statistically significant effects for value of owner-occupied housing, percentage of minority population, unemployment rate, median-household income, the age group between 55 to 64, and population size. These findings confirm several hypotheses about the way heterogeneous preferences, community wealth, unemployment and population size influence the decision to volunteer in different ways. From the value of owner-occupied housing, communities with more homogenous preferences in terms of having higher levels of social cohesion are more

likely to volunteer. However, communities with a very high or low proportion of ethnic minorities contain homogenous preferences but have lower levels of volunteering. Within the context of police services, one must consider the history of race relations (Gabbidon and Higgins 2009; Schafer, Huebner, and Bynum 2003; Schuck, Rosenbaum and Hawkins 2008), and recall how police services tend to be less satisfactory in areas containing a high proportion of minorities (Wehrman and Angelis 2011). Low levels of service satisfaction in jurisdictions with large minorities, the fact that these communities tend to possess lower wealth and lack the human and financial capital to engage in and support voluntary activities, raise issues of equity in terms of who coproduces and who benefits from coproduction. This is an important issue that is the subject of future research. Meanwhile, median-household income shows that as wealth increases there are higher levels of volunteering. However, the squared value indicates that extremely low or high wealth communities have lower levels of volunteering, suggesting that individuals in such wealth brackets have higher opportunity costs of volunteering. Unemployment rate is also significant in both models, but we cannot ascertain whether higher unemployment leads individuals to volunteer more or whether unemployment leads to a higher rate of crime and therefore agencies have to utilize more volunteer officers to fight crime.

Finally, the age group from 55 to 64 is significant and positive in both analyses, providing support for prior studies about how former police officers constitute a significant subset of individuals who tend to participate as volunteer officers (Wolf, Albrecht, and Dobrin 2015). In terms of population size, the results indicate that population size positively affects law enforcement agencies' decision to rely on volunteers. This contradicts the initial hypothesis that jurisdictions with small and large populations are more likely to volunteer, while moderate size communities are less likely to do so. However, as mentioned before, population could be

interpreted in a variety of ways based on whether one borrows from government failure or social cohesion as an explanation. It could be that as population increases, agencies are faced with higher service demands, and police agencies begin to rely on voluntary arrangements to meet such needs.

A limitation of this analysis is that the results may not readily be generalizable to other public service areas. Another drawback is that citizens who volunteer for law enforcement may be largely different from those who volunteer in other public services. As mentioned in the example of the NYPD Auxiliary Police Program, volunteers often conduct formal duties such as uniformed patrol and crime prevention, raising the concern about the differences between this specialized group of volunteers and other forms of general volunteering in public safety. Keeping these two points in mind, it may be necessary to explore the determinants of coproduction programs in other policy areas as well as consider different types of coproducers within individual policy realms. Another avenue for future research is the question of equity. While the minority representation variable is not significant in this analysis, jurisdictions with a large proportion of minorities tend to face higher demands for police services, and these communities also tend to score lower on indicators of human and financial capital. In such communities, the question is not whether there is a greater need for coproduction but rather how to increase coproduction among such populations. Studies have argued how symbolic representation can enhance trust and legitimacy, leading to greater cooperation and coproduction from citizens. This is where public agencies could take initiatives to design coproduction programs so that disadvantaged citizens can better participate, raising the potential to generate gains in both efficiency and equity.

Summary of Findings: Effects of Coproduction on Performance

The second empirical chapter examines how management can shape organizational performance through the use of a large-N dataset. Applying a formal model of management on a large sample of law enforcement agencies, the analysis confirms the prior theoretical expectation that management has an impact on improving performance. The significant findings for the use of reserve/auxiliary personnel on performance suggest that coproduction is an important element for managers to consider in terms of substituting for the lack of personnel or for complementing external efforts to engage with the community.

Summarizing the key findings, beginning with the set of managerial activities, internal management is found to be significant for clearing violent crime in both the additive and interaction models. In particular, internal managerial activities composed of human resource decisions, technological innovations, and comprehensiveness of written directives are statistically significant in clearing violent crimes. Meanwhile, the set of external managerial activities comprised of networking and other community-oriented management are significant but negatively associated with clearing property crimes. This contradicts the hypothesis that external activities should contribute to enhancing the ability of officers to clear crimes through arrest, suggesting that these activities may divert officers from core crime-fighting activities to more externally-oriented activities.

For the environmental and control variables, crime rate, staff size change, volunteer officers, minority representation, and population size are statistically significant only for total clearance rates. Crime rate is positively associated with clearance rates, contradicting the hypothesis that higher crime renders greater task difficulty and reduces the ability of police agencies to clear crimes by arrest. However, this may confirm a prior limitation of clearance

rates in which higher crime areas might have more arrests made, regardless of the quality of police performance. In fact, the positive coefficients for staff size change shows that clearance rates rise in conjunction with an increase in staffing levels. More staff could mean that an agency is faced with greater service demands for dealing with crime in a jurisdiction, leading to subsequent increases in the number of arrests made. Meanwhile, minority representation is statistically significant for both the number and ratio. This demonstrates that greater representation can be a resource for enhancing the capacity of police agencies to clear crimes. Population is negatively associated with clearance rates, suggesting that an increase in population complicates the tasks of clearing crimes effectively. Finally, the use of volunteer officers is statistically significant for both the ratio and numbers. A one percentage point increase in the number of volunteer officers is associated with a 0.02 percentage point increase in performance, while the opposite effect of a 0.02 percentage point decrease in performance occurs for the ratio of volunteer officers. This confirms the first hypothesis in which the use of volunteer officers as complements to existing personnel contributes to better performance. The second hypothesis is also confirmed where the use of volunteer officers as substitutes decreases performance.

However, separating the results for violent and property crime clearance, the number of volunteer officers is positively associated with clearing violent crimes, while the ratio of volunteer officers is negatively associated with clearing property crimes only. This holds for both the additive and interaction model. Substantively, this result show that agencies benefit more from using volunteer officers to assist in addressing violent crimes. On the other hand, the decrease in performance for property crimes when using volunteers as substitutes suggests that they are not likely to be effective in maintaining present levels of property crime clearance.

Meanwhile, for property crime clearance, one puzzling finding is that the ratio of full-time officers engaged in peripheral tasks is positively associated with an increase in performance. The same applies for the positive effect of agency hiring freeze. These two variables contradict the hypothesis of functioning as a constraint on police organizations. One possible explanation might be that such reductions in manpower lead to a subsequent decrease in agencies' capacity to solve property crimes, thereby increasing the property crime rate. However, the positive association between staff size change and total clearance rates observed in Table 6 may be offsetting this spike in the property crime rate. Nonetheless, it is difficult to ascertain a precise causal link from the current analysis.

As for other resources and constraints, population density is negatively associated with clearing violent crimes, while population size is negatively associated with clearing property crimes only when volunteer officers are used as substitutes. Overall, they indicate that these variables impose a constraint on police agencies and that performance is negatively affected in highly populated urban areas. Meanwhile, the percentage of minority population is positively associated with clearing property crimes only. However, since the variable for minority representation is not significant for property crime clearance, it may be that jurisdictions with a higher proportion of minorities face a higher property crime rate and therefore more arrests are made, regardless of the quality of police performance.

From the interaction between external management and the environment, volunteer officers may independently contribute to improving performance, while their diversion to assisting in external activities such as networking and community-oriented activities may decrease the amount of resources devoted to assisting in core activities such as crime prevention, leading to a decrease in performance. In terms of the interaction for minority representation, in

contrast to the additive models, the interaction shows that while minority representation is independently associated with a decrease in performance, agencies that engage in external managerial activities are able to reduce the negative impact of minority representation and use this as a leverage for improving clearance rates.

Overall, the findings confirm the hypotheses that the use of volunteer officers is positively associated with service outcomes when used as complements, while negatively associated with service outcomes when used as substitutes. Their differential impact becomes clearer when decomposing the results into violent and property crime clearance rates. The results suggest that agencies benefit more from volunteer officers assisting full-time personnel in clearing violent crimes rather than property crimes. In addition, from the interaction models, when externally-oriented activities are implemented, they decrease the positive impact of using volunteer officers for clearing property crimes. However, these activities may contribute to clearing violent crimes even when volunteer officers are used as substitutes. In sum, the findings lend support to prior theories about how volunteers, even when they undergo specialized training and certification that renders them capable of assuming certain professional functions, cannot fully substitute for full-time paid personnel while expecting to maintain current service levels. Rather, the results confirm the notion that agencies can benefit from coproduction programs where citizen volunteers assume a role of assisting rather than replacing service agents. The broader implication for practice is that citizen volunteers can function as a valuable resource that adds further leverage for public organizations to utilize in fighting crime.

Several limitations as well as directions for future research merit discussion. Since volunteer officers are highly trained and coproduce in an institutionalized setting, this is a relatively rare form of coproduction activity that limits the generalizability of the findings to this

type of coproduction. Further research may require a comparison with this form of coproduction to more general volunteering activities in police organizations or other forms of citizen coproduction in public safety. Second, the LEMAS survey does not provide information about the precise activities that volunteer officers engage in. For instance, while the results indicate that volunteer officers are more useful for clearing violent crimes, police organizations vary in terms of training and authorizing volunteer officers as well as utilizing them in different ways. For those interested in how volunteer officers exactly contribute to performance, future studies could address some of these issues by resorting to qualitative research designs that explore volunteer officers' activities in specific settings. Third, the research design does not enable a causal analysis. Future studies could utilize longitudinal data or devise experimental designs to verify whether the use of volunteer officers determines performance or whether lower performance drives agencies to resort to the use of volunteer officers. Finally, although not the focus of this chapter, the significant finding on minority representation provides a venue for testing the impact of representative bureaucracy on performance. Studies can build upon this to explore these implications further.

Summary of Findings: Citizen Motivations to Coproduce

The final empirical chapter explores the question of why some citizens coproduce more actively than others using empirical data containing information about citizens already involved in a coproduction activity. The analysis employs an ordered logit regression to analyze the factors that affect the degree, or frequency, of active participation in citizen patrol activities.

Concerning several key incentives such as material, solidary or expressive motives, expressive motives are closely associated with greater frequency of participation. Originally

from the self-reported question that asks what is the single main motivation for being active, an overwhelming proportion of respondents had stated that the main reason for being active in citizen patrols consisted of socializing with patrol members and other members of the community and police. However, the ordered logit results indicate that greater frequency of participation is explained by expressive motives such as contributing to greater community safety. In addition, from the self-efficacy category, the results suggest that the belief that their involvement can lead to a reduction in community crimes explains greater frequency of participation. From the community conditions category, as perceptions about the severity of crime increase, citizens are more active. These three findings indicate that the greater frequency of engaging in coproduction is largely driven by motives that pertain to expressive motives in terms of enhanced service levels rather than solidary motives such as socializing with others. This means that citizens who are more active in coproduction are driven by a desire that focuses on the core of the service itself, that is, to improve public safety. In the context of social desirability bias, this is an important finding that shows how individuals in collectivist societies may be more likely to engage in socially desirable responses, whereas the underlying motivations driving actual behaviors may be quite different.

Meanwhile, this is not to devalue the importance of solidary incentives. Greater frequency of coproduction behavior may be contingent upon the desire to achieve expressive benefits. However, as observed from the self-reported measure about the main reason for being currently active, motivations are mutually supportive in that solidary motives could act as a key preservation force for expressive motives, particularly if an organization consists of a volunteer workforce. If members do not support each other through solidary mechanisms and some feel

left out or there is conflict among members, then expressive benefits alone cannot sustain organizational involvement in the long term.

Assisting in local police activities which is reflective of public service motivation (PSM) is associated with less frequency in participation. However, this is not to say that PSM is less of an important driver for those who participate more frequently in public services. Rather, viewed from the perspective of dissatisfaction with current police activities, this may reflect an increase in PSM if we interpret this as influencing individuals' desire to invest greater personal efforts to enhance service quality rather than rely solely on police activities. Initially, PSM was linked with assisting in local police activities since it is tied to a more specific task of contributing to local police efforts. But as mentioned before, there is significant overlap between PSM and expressive motives on the grounds that both ensuring community safety and assisting in local police activities contain elements of working towards the public interest and generally involve collective action. Future research could address this issue by devising measures that more clearly distinguish between these nuances among motivations.

Examining the concept of salience in more detail, from the self-efficacy category, citizens who believe that participation can lead to a decrease in community crimes display a greater frequency of participation. In addition, from the community conditions category, those who perceive crime problems to be more severe are more likely to engage more frequently. This attests to the role of perceptions about crime rather than actual experience with crime victimization in motivating citizens to actively participate. It confirms the notion that salience of the service is a significant motivating factor, and more broadly it suggests the importance of information distribution and raising awareness about how citizen input matters (Thomsen and Jakobsen 2015).

Finally, the significance of several control variables such as the presence of children, homeownership, and duration of residence confirm prior studies about volunteering in general. The results indicate that the presence of children can function as a constraint which increases the opportunity cost of time, and therefore citizens having children will be less prone to participate more actively. Meanwhile, homeownership and duration of residence confirms notions about social cohesion and stability. Low levels of mobility can instill a sense of attachment and enhance social cohesion, providing an incentive to be involved in community affairs and to volunteer in coproduction initiatives (Marschall 2004). The results of this study provide further indication that community cohesion and stability can increase the degree to which citizens participate more actively.

In sum, the fact that those who are more active in the organization tend to be driven by a desire to improve service quality provides crucial information for managers to use, even in the context of an east asian country that emphasizes solidary motives. Overall, the benefit of an international study is that it applies the same theories and research questions on motivation to coproduce in a different setting, broadening our understanding of how coproduction functions and varies across national contexts. If supported by additional research, these implications can provide valuable information for public managers in terms of distinguishing between different managerial strategies for recruiting citizens to coproduce as well as the retention, coordination, and supervision of those who are actively involved in organized coproduction programs. The fact that those who are more active in the organization tend to be driven by a desire to improve service quality (i.e. enhancing community safety) provides crucial information for managers to use. Getting citizens involved in the first place is an important task in and of itself. However, once citizens are recruited and become involved more actively in coproducing a service, the

managerial activities of designing programs that prompt citizens to be more active and to retain them in the long run may require different organizational objectives and incentives. These management activities pertain to issues of long-term sustainability and continuous innovation of existing programs. But motivations are mutually supportive, and even if greater frequency of participation is closely linked with tangible benefits, solidary and other motivations must be considered in tandem to sustain coproduction activities in the long run. Future research could build upon these points by exploring motivations behind active citizen participation in other forms of coproducing public safety, in other countries, and/or other policy domains so that different managerial strategies can be tailored to different forms of coproduction.

Limitations and Implications

One drawback of this dissertation is that the policy area is limited to public safety, limiting its applicability to other policy contexts. For example, the level of tolerance for which regular producers are willing to allow citizens to take part in coproducing services will vary. Parrado et al. (2013) note in their focus group discussions about how service providers in highly professionalized services such as healthcare will be more reluctant to give up power compared to what public safety officers are willing to do. Therefore, one should take caution in generalizing these results to other policy realms.

Another limitation is that the third research paper derives its sample from South Korea which may be limited by a different institutional context or administrative traditions compared to that of the United States. These variations are not captured in the model, and therefore there may be important differences in terms of the drivers of coproduction that have not been discussed. Future research could include data on citizen patrols from a different country so that a

comparative study might be able to incorporate measures on institutional differences. Meanwhile, the survey is a secondary study, meaning that the questions were not initially designed according to a coproduction framework. Therefore, the analysis has to suffice with questions that the original researcher had designed.

Finally, because all the studies are cross-sectional in nature, there are potential problems of endogeneity in the model specifications. One of the ultimate goals of coproduction is to engender positive outcomes such as decrease in crime. But recall that Rosentraub and Warren (1987) mentioned how rising crime rates led to lower support for coproduction by police officers. This is because officers begin to focus more on core crime fighting tasks as opposed to secondary activities such as improving relationships with community residents. What this suggests is that instead of coproduction leading to outcomes, the causal relationship might be reversed in that outcomes may influence the willingness to coproduce. However, the hope is that Community-Oriented Policing as a federally-sponsored program can compensate for this shortcoming since it incentivized law enforcement agencies to actively engage in coproduction and other externally oriented activities. In other words, it acts as an exogenous shock (treatment effect) so that, for those agencies that have adopted and implemented community policing, we are able to address the problem of endogeneity to some degree.

Overall, these three empirical analyses demonstrate how law enforcement agencies actively utilize citizens in service production and delivery, citizen involvement can improve organizational performance goals, and citizens actively participate to advance the public safety. The use of large-N data analysis serves to further the process of theory testing and development. From a theoretical standpoint, the first analysis on the determinants of coproduction borrows from the nonprofit literature to examine a public-sector issue, suggesting that coproduction lies at

the intersection of public and nonprofit management. Second, the chapter on coproduction performance attests to the utility and applicability of the O'Toole-Meier model of management to address questions of management in different service realms. Finally, the results from the chapter on citizen patrols in South Korea demonstrate how theories on coproduction motivations can be applied to different contextual settings and that individuals share similar underlying motives for participating in public service delivery. The subsequent findings from each chapter can also provide information for practitioners in terms of designing programs for recruiting and retaining citizens for law enforcement duties, as well as managing programs to further organizational goals.

REFERENCES

Alford, John. 1998. “A Public Management Road Less Travelled: Clients as Co-producers of Public Services.” *Australian Journal of Public Administration*, 57(41): 28-137.

Alford, John. 2002. “Why do Public-Sector Clients Co-Produce?” *Administration and Society* 34(1): 32-56.

Alford, John. 2009. *Engaging Public Sector Clients: From Service-Deliver`y to Co-production*. Palgrave MacMillan, Basingstoke, UK.

Aligica, Paul D., and Vlad Tarko. 2013. “Co-Production, Polycentricity, and Value Heterogeneity: The Ostroms’ Public Choice Institutionalism Revisited.” *American Political Science Review*, 107(4): 726-741.

Amna, Erik. 2010. “Active, passive, or stand-by citizens? Latent and manifest political participation.” In: Amna, Erik. (ed.), *New Forms of Citizen Participation: Normative Implications*. Nomos: Baden-Baden, pp. 191–203.

Avellaneda, Claudia N. 2009. “Municipal Performance: Does Mayoral Quality Matter?” *Journal of Public Administration Research and Theory,* 19(2): 285-312.

Baciu, Olivia Andreea, and Ilie Parpucea. 2011. “Socio-Economic Factors Impact on Crime Rate.” *Review of Economic Studies & Research Virgil Madgearu*. Vol. 4 Issue 2, p. 5-20.

Behn, Robert D. 2003. “Why Measure Performance? Different Purposes Require Different Measures.” *Public Administration Review,* 63(5): 586-606.

Bonomo, Vittorio, and James J. Sullivan. 1968. “The Economic Determinants of the Crime Rate: An Econometric Analysis.” *Criminologica*, Vol. 6 Issue 3, p. 41-47.

Bovaird, T. 2007. “Beyond Engagement and Participation: User and Community Coproduction of Public Services.” *Public Administration Review*, Vol. 67, Issue 5, p. 846-860.

Bovaird, Tony, and E. Loeffler. 2012. “From Engagement to Co-Production: The Contribution of Users and Communities to Outcomes and Public Value.” *International Society of Third Sector Research* 23(4): 1119-1138.

Bovaird, Tony, Gregg G. Van Ryzin, Elke Loeffler, and Salvador Parrado. 2015. “Activating citizens to participate in collective co-production of public services.” *Journal of Social Policy,* 44: 1-25.

Boyle, D. and M. Harris. 2009. *The Challenge of Co-Production: How Equal Partnerships Between Professionals and the Public are Crucial to Improving Public Services.* London: nef, The Lab, NESTA.

Boyte, Harry C. 2005. “Reframing Democracy: Governance, Civic Agency, and Politics.” *Public Administration Review*, 65(5): 536-46.

Bozeman, Barry. 2002. “Public-Value Failure: When Efficient Markets May Not Do.” *Public Administration Review* 62(2): 145-161.

Brady H.E., S. Verba, and K.L. Scholozman. 1995. “Beyond SES: A resource model of political participation.” *American Political Science Review,* 89(2): 271-294.

Brandsen, Taco, and Marlies Honingh. 2015. “Distinguishing Different Types of Coproduction: A Conceptual Analysis Based on the Classical Definitions.” *Public Administration Review*, 76(3): 427-435.

Brandt, Mark J., Hans IJzerman, Ap Dijksterhuis, Frank J. Farachc, Jason Geller, Roger Giner-Sorolla, James A. Grange, Marco Perugini, Jeffrey R. Spies, and Anna van’t Veer. 2014. “The Replication Recipe: What makes for a convincing replication?” *Journal of Experimental*

Social Psychology, 50: 217-224.

Breci, Michael G. 1997. “The transition to community policing: The department’s role in upgrading officers’ skills.” *Policing: An International Journal of Police Strategy and Management*, 20: 766–76.

Brehm, John, and Scott Gates. 1993. *Working, shirking, and sabotage*. Ann Arbor: University of Michigan Press.

Brewer, Gene A. 2003. “Building Social Capital: Civic Attitudes and Behavior of Public Servants.” *Journal of Public Administration Research and Theory*, 13(1): 5–26.

Brewer, R., and P. Grabosky. 2014. “The Unraveling of Public Security in the United States: The Dark Side of Police-Community Co-production.” *American Journal of Criminal Justice 39*(1): 139-154.

Bromley, M.L., and J.K. Cochran. 1999. “A Case Study of Community Policing in a Southern Sheriff's Office.” *Police Quarterly*, 2: 36-56.

Brudney, Jeffrey L. 1983. “The Evaluation of Co-production Programs”. *Policy Studies Journal*, 12(2): 376-385.

Brudney, Jeffrey L. and Robert E. England. 1983. “Toward a Definition of the Co-production Concept.” *Public Administration Review* 43(1): 59-65.

Brudney, Jeffrey L. 1984. “Local Coproduction of Services and the Analysis of Municipal Productivity.” *Urban Affairs Review*, 19: 465-484.

Brudney, Jeff. 1989. “Using Co-production to Deliver Services.” In J. Perry (ed.), *Handbook of Public Administration.* Jossey-Bass, San Francisco.

Brudney, Jeffrey. 1990. “Expanding the Government-by-Proxy Construct: Volunteers in the Delivery of Public Services.” *Nonprofit and Voluntary Sector Quarterly*, 19(4): 315-328.

Brudney, Jeffrey, and Robert Warren. 1990. “Multiple Forms of Volunteer Activity in the Public Sector: Functional, Structural, and Policy Dimensions.” *Nonprofit and Voluntary Sector Quarterly*, 19(1): 47-58.

Brudney, J. 1990. *Fostering volunteer programs in the public sector: Planning, introducing and managing voluntary activities*. San Francisco: Jossey-Bass.

Brudney, Jeffrey L. 1993. “Volunteer involvement in the delivery of public services: Advantages and disadvantages.” *Public Productivity and Management Review, 16: 283-297.*

Brudney, Jeffrey L, and J. Edward Kellough. 2000. “Volunteers in State Government: Involvement, Management, and Benefits.” *Nonprofit and Voluntary Sector Quarterly,* 29(1): 111-130.

Brudney, Jeffrey L. Laurence J. O’Toole, and Hal G. Rainey. 2000. *Advancing Public Management.* Washington, DC: Georgetown University Press.

Bryson, John M., Barbara C. Crosby, and Laura Bloomberg. 2014. “Public Value Governance: Moving Beyond Traditional Public Administration and the New Public Management.” *Public Administration Review,* 74(4): 445-456.

Burruss, G., and M.J. Giblin. 2014. “Modeling Isomorphism on Policing Innovation: The Role of Institutional Pressures in Adopting Community-Oriented Policing.” *Crime & Delinquency*, 60: 331-355.

Cameron, A. Colin, and Pravin K. Trivedi. 2010. *Microeconometrics Using Stata*, Revised Edition. Stata Press.

Carr, P., Napolitano, L., and Keating, J. 2007. “We never call the cops and here is why: A qualitative examination of legal cynicism in three Philadelphia neighborhoods.” *Criminology*, 45, 445-480.

Carr, P.J. 2012. “Citizens, community, and crime control: The problems and prospects for negotiated order.” *Criminology & Criminal Justice: An International Journal*, Vol 12(4), pp. 397-412.

Carr, Jered B. 2015. “What Have We Learned about the Performance of Council-Manager Government? A Review and Synthesis of the Research.” *Public Administration Review*, 75(5): 673-689.

Carson, R. T., & Sun, Y. 2007. The Tobit model with a non-zero threshold. *The Econometrics Journal, 10*(3), 488-502.

Chappell, A.T. 2009. “The Philosophical Versus Actual Adoption of Community Policing: A Case Study.” *Criminal Justice Review*, 34: 5-28.

Chennareddy, Venkareddy. 2010. “Econometric Analysis of Police Officers: A Three Stage Least Squares and Pooled Cross-Sectional and Quarterly Time-Series Data.” *International Journal of Business & Public Administration*. Vol. 7 Issue 2, p. 124-133.

Choi, Eunryol and Jinhee Park. 2012. Jayool Bhangbumdae Bupryul Jaejung Banghyangae Gwanhan Noneu [A Discussion on the Enactment of the Voluntary Crime Prevention Patrol Legislation]. *Hangook Cheean Haengjung Nonjib*. 8(1):1-25.

Choi, Cheon Geun, Richard C. Feiock, and Jungah Bae. 2013. “The Adoption and Abandonment of Council-Manager Government.” *Public Administration Review* 73(5): 727–36.

Choi, Sunwoo. 2001. “A Co-production Approach for Policing Services [Cheean Seobeesu eu Gongdong Saengsanronjuk Jupgeun]”. *Hankook Gongan Haengjung Hakhwaebo,* 11:375-411

Chun, Youngshil. 2005. Jeeyoek Joomin eu Jayool Bangbym Hwaldong Shiltae Mit Hwalsunghwa Bangan *[The Status of Community Residents’ Crime Prevention Activities and Vitalization Measures]*. Seoul: Hyeongsa Jungchaek Yeon-goowon [Korea Institute of

Criminology].

Clark, B., J. Brudney, and S.G. Jang. 2013. “Coproduction of Government Services and the New Information Technology: Investigating the Distributional Biases.” *Public Administration Review*, 73(5): 687-701.

Clary, E. Gil, Mark Snyder, and Arthur Stukas. 1996. “Volunteers’ Motivations: Findings from a National Survey.” *Nonprofit and Voluntary Sector Quarterly*, 25: 485-505.

Clary, E. Gil, Mark Snyder, Robert D. Ridge, John Copeland, Arthur A. Stukas, Julie Haugen, and Peter Miene. 1998. “Understanding and Assessing the Motivations of Volunteers: A Functional Approach.” *Journal of Personality and Social Psychology*, 74: 1516-1530.

Congressional Research Service. 2011. “Community Oriented Policing Services (COPS): Background, Legislation, and Funding.” By James, Nathan. RL33308.

Corbin, John J. 1999. “A study of factors influencing the growth of nonprofits in social services.” *Nonprofit and Voluntary Sector Quarterly* 28:296.

Cordner, Gary. 2014. “Chapter 7: Community Policing.” In *The Oxford Handbook of Police and Policing*, (ed). By Michael D. Reisig and Robert J. Kane. New York, NY: Oxford University Press.

Dalton, Russell J. 2008. *Citizen Politics: Public Opinion and Political Parties in Advanced Industrial Democracies.* Washington: CQ Press.

Dekker, Paul, and Loek Halman. 2003. “Volunteering and values: An introduction.” In: Dekker, Paul, and Loek Halman. (eds). *The Values of Volunteering: Cross-cultural Perspectives*. New York: Kluwer Academic/Plenum Publishers, pp. 1–17.

Denhardt, Janet V., and Robert B. Denhardt. 2000. “The New Public Service: Serving Rather than Steering.” *Public Administration Review,* 60(6): 549-559.

U.S. Department of Justice (DOJ). 1994. *Understanding Community Policing: A Framework for Action*. U.S. Department of Justice, Office of Justice Programs, Bureau of Justice Assistance.

U.S. Department of Justice (DOJ). 2014. *Community Oriented Policing Services (COPS)*. U.S. Department of Justice.

Dicker, Todd J. 1998. "Tension on the Thin Blue Line: Police Officer Resistance to Community-Oriented Policing." American Journal of Criminal Justice, Vol. 23 No. 1, p.59-82.

Donohue, III, John J. 2007. "Economic Models of Crime and Punishment." *Social Research*. Vol. 74 Issue 2, p. 379-412.

Elazar, D. J. 1972. *American federalism: A view from the states*. New York: Thomas Y. Crowell.

Evans, W.N., and E.G. Owens. 2007. "COPS and Crime." *Journal of Public Economics*, 91: 181–201.

Favero, Nathan, and Justin B. Bullock. 2015. "How (Not) to Solve the Problem: An Evaluation of Scholarly Responses to Common Source Bias." *Journal of Public Administration Research and Theory*, 25: 285-308.

Fenwick, T. 2012. "Co-production in Practice: A Sociomaterial Analysis." *Professions & Professionalism*, Vol. 2 Issue 2, Special section p1-16.

Ferris, James M. 1988. "The Use of Volunteers in Public Service Production: Some Demand and Supply Considerations." *Social Science Quarterly,* 69(1): 2-23.

Festinger, L., Schachter, S., and Back, K. 1963. *Social pressures in informal groups: A study of human factors in housing*. Stanford, CA: Stanford University Press.

Fisher, J.C., and K.M. Cole. 1993. *Leadership and management of volunteer programs: A guide for volunteer administrators.* San Francisco: Jossey-Bass.

Fledderus, Joost, and Marlies Honingh. 2016. "Why people co-produce within activation

services: The necessity of motivation and trust – an investigation of selection biases in a municipal activation programme in the Netherlands." *International Review of Administrative Sciences*, 82(1): 69-87.

Gabbidon, Shaun L., and George E. Higgins. 2009. "The Role of Race/Ethnicity and Race Relations on Public Opinion Related to the Treatment of Blacks by the Police." *Police Quarterly,* 12(1): 102-115.

Gerrish, Ed. 2016. "The Impact of Performance Management on Performance in Public Organizations: A Meta-Analysis." *Public Administration Review,* 76(1): 48-66.

Goldstein, Herman. 1979. "Improving policing: A problem-oriented approach." *Crime and Delinquency*, 33 (1): 6–30.

Greenberg, D.F. 2001. "Time Series Analysis of Crime Rates." Journal of Quantitative Criminology, Vol. 17, No. 4., p.291-327.

Gronbjerg, Kirsten A., and Laurie Paarlberg. 2001. "Community variations in the size and scope of the nonprofit sector: Theory and preliminary findings." *Nonprofit and Voluntary Sector Quarterly*, 30:684.

Hatry, Harry P. 1999. *Performance Measurement: Getting Results.* Washington, DC: Urban Institute.

Hilal, Susan M., and David P. Olson. 2010. "Police Reserve Officers: Essential in Today's Economy and an Opportunity to Increase Diversity in the Law Enforcement Profession." *The Police Chief,* 77: 92-94.

Hupe, Peter. 1993. "The Politics of Implementation: Individual, Organizational and Political Coproduction in Social Services Delivery." In M. Hill (ed.), *New Agendas in the Study of the Policy Process*. Harvester Wheatsheaf, London.

Hong, Sounman. 2016a. “Representative Bureaucracy, Organizational Integrity, and Citizen Coproduction: Does an Increase in Police Ethnic Representativeness Reduce Crime?” *Journal of Policy Analysis and Management*, 35(1): 11-33.

Hong, Sounman. 2016b. “Does Increasing Ethnic Representativeness Reduce Police Misconduct? Evidence from Police Reform in England and Wales.” *Public Administration Review,* DOI: 10.1111/puar.12629.

Hwang, Hyunlak. 2011. Jayool Bangbumdae Bup Jaejungeul Weehan Bupjungchaekjuk Gochal [Legal and Political Considerations for the Enactment of the Voluntary Crime Prevention Patrol Legislation]. *Hanyang Beophak*, 22(4): 435-460.

Jakobsen, Morten. 2013. “Can Government Initiatives Increase Citizen Coproduction? Results of a Randomized Field Experiment.” *Journal of Public Administration Research and Theory*, 23:27-54.

Jakobsen, M., and S.C. Andersen. 2013. “Coproduction and Equity in Public Service Delivery.” *Public Administration Review*, Vol. 73, Issue 5, pp.704–713.

Jakobsen, Morten, Oliver James, Donald Moynihan, and Tina Nabatchi. 2016. “JPART Virtual Issue on Citizen-State Interactions in Public Administration Research.” *Journal of Public Administration Research and Theory,* doi:10.1093/jopart/muw031.

Jung, Yoonsu. 1994. “Co-production of Policing Services and Policy Directions [Cheean Seobeesu Gongdong Saengsankwa Jungchaek Banghyang].” *Hankook Jungchaek Hakhwaebo*, 3(1): 85-106.

Kasarda, John, and Morris Janowitz. 1974. “Community Attachment in Mass Society.” *American Sociological Review,* 39: 328-339.

Kelling, George L., and Mark H. Moore. 1988. “The Evolving Strategy of Policing.” In *Perspectives on Policing,* Washington, DC: National Institute of Justice.

Kelling, George, and William Bratton. 1993. “Implementing community policing: The administrative problem.” In *Perspectives on policing*. Washington, DC: National Institute of Justice.

Kennedy, David. 1990. “Fighting Fear in Baltimore County.” In John F. Kennedy School of Government case study, C16-90-938.0. Cambridge, MA: Harvard University Press.

Kennedy, David. 1993. “The strategic management of police resources.” In *Perspectives on policing*. Washington, DC: National Institute of Justice.

Kerley, K.R., and M.L. Benson. 2000. “Does Community-Oriented Policing Help Build Stronger Communities?” *Police Quarterly*, 3: 46-69.

Kettl, Donald F. 2015. “The Job of Government: Interweaving Public Functions and Private Hands.” *Public Administration Review*, 75(2): 219-229.

Kim, In. 1997. “The Effects of Co-producing Policing Services [Gyeongchal eu Gongdong Saengsan eu Hyo-gwa].” *Hankook Haengjung Hakhwaebo*, 31(4): 77-94.

Kiser, Larry L., and Stephen L. Percy. 1980. “The Concept of Coproduction and Its Implications for Public Service Delivery.” Workshop in Political Theory and Policy Analysis. Paper prepared for delivery at the 1980 Annual Meetings of the American Society for Public Administration.

Kiser, Larry L. 1984. “Toward an Institutional Theory of Citizen Coproduction.” *Urban Affairs Review*, 19: 485-510.

Klingner, Donald E. 1983. *Public administration: A management approach*. Boston: Houghton Mifflin.

Kort, Michiel, and Erik-Hans Klijn. 2011. “Public-Private Partnerships in Urban Regeneration Projects: Organizational Form or Managerial Capacity?” *Public Administration Review*, 71(4): 618-626.

Kristensen, Nicolai, Lotte Bogh Andersen, and Lene H. Pedersen. 2011. “Public Service Efficacy.” *International Journal of Public Administration,* 35(14): 947-958.

Lecy, Jesse D., and David M. Van Slyke. 2012. “Nonprofit Sector Growth and Density: Testing Theories of Government Support.” *Journal of Public Administration Research and Theory,* 23:189-214.

Lee, Sungshik. 2001. Jeeyeok Joomin Bangbum Soonchal Hwaldong eu Chamyeo Yo-in Mit Hwalseonghwa Banganae Gwanhan Kyeonghum Yeongu [A Conceptual Study on the Participatory Factors and Vitalization Measures for Community Residents’ Voluntary Crime Prevention Activities]. *Hyeongsa Jungchaek Yeongoo*, 12(3): 111-137.

Lee, Sungjin and Euyoung Kim. 2005. Bumjwae Yebangeul Weehan Gyeongchalgwa Mingan Gyeongbee eu Sangho Hyubryeok Bangan [Police and Private Security Cooperation for Crime Prevention]. *Hankook Sports Research*, 16(2): 323-36

Lee, Jina and Eugap Hwang. 2009. Shimindul eu JayulBangbym Hwanldong Junnyeomdoae Younghyangeul Meecheenun Yoinae Gwanhan Yeongoo [Research on the Factors that Influence Citizens’ Level of Attention on Crime Prevention Activities]. *Hankook Sahwae Yeongoo*, 12(2): 208.

Lee, C.H., and C.B. Lee. 2008. “Factors affecting strategy commitment to community-oriented policing (COP) among South Korean police officers.” *Policing: An International Journal of Police Strategies & Management*, Vol. 34 No. 4, pp. 713-734.

Lee, Youngnam. 2012. Jayool Bangbumdae Jojik Mit Woonyoung eu Jeewon Ganghwa Bangan

Yeongu [A Study on the Organization and Operational Support for Crime Prevention Patrols]. *Kyeongchal Hak Nonchong*, 7(2): 363-382.

Le Grand, Julian. 1991. The theory of government failure. British Journal of Political Science 21:423–42.

Levine, Charles H. 1984. "Citizenship and Service Delivery: The Promise of Co-production." *Public Administration Review,* 44(Special Issue): 178-189.

Lewis, William G. 1989. "Toward Representative Bureaucracy: Blacks in City Police Organizations." *Public Administration Review,* 49(3): 257-268.

Lilley, D., and R. Boba. 2008. "A Comparison of Outcomes Associated With Two Key Law-Enforcement Grant Programs." *Criminal Justice Policy Review*, 19: 438-465.

Lineberry, Robert, and Edward Fowler. 1967. "Reformism and Public Policies in American Cities." *American Political Science Review,* 41:701-716.

Long, J. Scott, and Jeremy Freese. 2006. *Regression Models for Categorical Dependent Variables Using Stata*. 2nd ed. College Station, TX: Stata Press.

Luksetich, William. 2008. "Government funding and nonprofit organizations." *Nonprofit and Voluntary Sector Quarterly* 37:434.

Macduff, N. 1997. "Solving the hazards of unions and volunteer relations in government organizations." *Journal of Volunteer Administration*, 16(1), 34-40.

Mankiw, N. Gregory. 2012. "Principles of Microeconomics, 6th Ed." Mason, OH: South-Western Cengage Learning, c2012.

Marschall, Melissa J. 2004. "Citizen Participation and the Neighborhood Context: A New Look at the Coproduction of Local Public Goods." *Political Research Quarterly*, 57(2): 231-244.

Mastrofski, S. 2006. ''Community Policing: A Skeptical View.'' In Weisburd, D. and Braga, A.

(eds), *Police Innovation: Contrasting Perspectives*, Cambridge: Cambridge University Press: 44–73.

Matsunaga, Yoshiho, and Naoto Yamauchi. 2004. "Is the government failure theory still relevant? A panel analysis using US state level data." *Annals of Public and Cooperative Economics* 75:227–63.

McCurley, S., and Lynch, R. 1996. *Volunteer management: Mobilizing all the resources in the community.* Downers Grove, IL: Heritage Arts.

McDonald, J. F., and Moffitt, R. A. 1980. "The uses of Tobit analysis." *The Review of Economics and Statistics,* 62, 318-321.

McDowall, David, and Colin Loftin. 2005. "Are U.S. Crime Rate Trends Historically Contingent?" *Journal of Research in Crime & Delinquency.* Vol. 42 Issue 4, p. 359-383.

McDowall, David, and Colin Loftin. 2009. "Do U.S. City Crime Rates Follow a National Trend? The Influence of Nationwide Conditions on Local Crime Patterns." *Journal of Quantitative Criminology.* Vol. 25 Issue 3, p. 307-324.

McGinnis, Michael D., ed. 1999. *Polycentric Governance and Development: Readings from the Workshop in Political Theory and Policy Analysis*. Ann Arbor: The University of Michigan Press.

Meier, Kenneth J., and Laurence J. O'Toole. 2001. "Managerial strategies and behavior networks: A model with evidence from U.S. public education." *Journal of Public Administration Research and Theory,* 11(3): 271-293.

Meier, Kenneth J., and Laurence J. O'Toole. 2002. "Public management and organizational performance: The impact of managerial quality." *Journal of Policy Analysis and Management*, 21(4): 543-629.

Meier, Kenneth J., and Laurence J. O'Toole. 2003. "Multilevel governance and organizational performance: Investigating the political-bureaucratic labyrinth." *Journal of Policy Analysis and Management*, 23(1): 31-47.

Meier, Kenneth J., Michael S. Pennington, and Warren S. Eller. 2005. "Race, Sex, and Clarence Thomas: Representation Change in the EEOC." *Public Administration Review,* 65(2): 171-17 9.

Milward, H.B., and K.G. Provan. 2000. "Governing the Hollow State." *Journal of Public Administration Research and Theory,* 10(2): 359-379.

Min, Hyung Dong. 2014. Jayeul Bhangbumdae Seolchi·Eunyongae Gwanhan Jaejung Bupryulan Bigyo Bunsuk Mit Lipbup Banghyangae Gwanhan Yeongu [Comparative Analysis on Legislative Bills and its Legislation Outlines regarding Installation and Operation of the Voluntary Crime Prevention Community]. *Hankook Kyeongchal Hakhwaebo*, 48:63-91.

Moore, Mark H., Robert Trojanowicz, and George Kelling. 1988. "Crime and policing." *National Institute of Justice Perspectives on Policing*. June: 1–13.

Moore, M. 1995. *Creating Public Value: Strategic Management in Government.* Harvard University Press: Cambridge, MA.

Morabito, M.S. 2010. "Understanding Community Policing as an Innovation: Patterns of Adoption." *Crime and Delinquency*, 56: 564-587.

Mosher, Frederick. 1980. "The Changing Responsibilities and Tactics of the Federal Government." *Public Administration Review*, 40(6): 541-548.

Moynihan, Donald P., and Sanjay K. Pandey. 2010. "The Big Question for Performance Management: Why Do Managers Use Performance Information?" *Journal of Public Administration Research and Theory*, 20(4): 849–66.

Musick, M., and J. Wilson. 2008. *Volunteers: A Social Profile*. Bloomington, IN: Indiana University Press.

Nabatchi, Tina. 2010. "Addressing the citizenship and democratic deficits: The potential of deliberative democracy for public administration." *The American Review of Public Administration*, 40(4): 376-399.

Needham, Catherine. 2008. "Realising the Potential of Co-production: Negotiating Improvements in Public Services." *Social Policy and Society*, 7, pp 221-231.

Nesbit, Rebecca. 2012. "The Influence of Major Life Cycle Events on Volunteer." *Nonprofit and Voluntary Sector Quarterly,* 41(6): 1153-1174.

Nesbit, Rebecca, Seong C. Kang, and Jeffrey L. Brudney. "Revisiting the Use of Volunteers in Public Service Production: Some Demand and Supply Considerations." Working Paper.

Nicholson-Crotty, S., and L.J. O'Toole. 2004. "Public Management and Organizational Performance: The Case of Law Enforcement Agencies." *Journal of Public Administration Research and Theory*, 14(1): 1-18.

Oh, Yoonsung. 2000. Jeeyeok Joomin Chamyeo Bumjwae Yebang Hwaldongae Daehan Gochal [Community Residents' Participation in Crime Prevention Activities]. *Hankook Kyeongho Hakhwaejee*, 3(1): 175-204.

Orme, J. G., & Buehler, C. 2001. Introduction to multiple regression for categorical and limited dependent variables. *Social Work Research, 25*(1), 49.

Osborne, S. P., Z. Radnor, and G. Nasi. 2012. "A New Theory for Public Service Management? Toward a (Public) Service-Dominant Approach." *The American Review of Public Administration* 43 (2): 135–158.

Osborne, Stephen P., and Kirsty Strokosch. 2013. "It Takes Two to Tango? Understanding the

Co-Production of Public Services by Integrating the Services Management and Public Administration Perspectives." *British Journal of Management*, 24: s31–S47.

Osgood Jr., J.L. 2011. "Collaborative service provision: the future of local government." *Journal of Town & City Management*, Vol. 2 Issue 4, p319-321.

Ostrom, Elinor, and Roger Parks. 1973. "Suburban Police Departments: Too many and Too Small?" In *The Urbanization of the Suburbs. Urban Affairs Annual Reviews* edited by Louis H. Masotti and Jeffrey K. Hadden 367-402. Beverly Hills, CA: Sage Publications.

Ostrom, Elinor, Roger Parks, and Gordon Whitaker. 1974. "Defining and Measuring Structural Variations in Interorganizationl Arrangements." *Publius* 4(4): 87-108.

Ostrom, Elinor, and Gordon Whitaker. 1973. "Does Local Community Control of Police Make a Difference? Some Preliminary Findings." *American Journal of Political Science* 17(10): 48-76.

Ostrom, Elinor. 1996. "Crossing the Great Divide: Co-production, Synergy and Development." *World Development* 24(6): 1073-1087.

O'Toole, Laurence J., Jr. 1997. "Treating Networks Seriously: Practical and Research-Based Agendas in Public Administration," *Public Administration Review* 57(1): 45-52.

O'Toole, Laurence J., and Kenneth J. Meier. 1999. "Modeling the Impact of Public Management: Implications of Structural Context". *Journal of Public Administration Research and Theory,* 9(4): 505-526.

O'Toole, Laurence J., and Kenneth J. Meier. 2003. "*Plus ca change:* Public management, personnel stability, and organizational performance." *Journal of Public Administration Research and Theory,* 13(1): 43-64.

O'Toole, Laurence J., and Kenneth J. Meier. 2004a. "Public management in intergovernmental networks: matching structural and behavioral networks." *Journal of Public Administration Research and Theory*, 14, 469–494.

O'Toole, Laurence J., and Kenneth J. Meier. 2004b. "Desperately seeking Selznick: cooptation and the dark side of public management in networks." *Public Administration Review*, 64, 681–693.

O'Toole, Laurence J., and Kenneth J. Meier. 2009. "The human side of public organizations." *The American Review of Public Administration*, 39, 499–518.

O'Toole, Laurence J., Jr., and Kenneth J. Meier. 2015. "Public Management, Context, and Performance: In Quest of a More General Theory." *Journal of Public Administration Research and Theory,* 25(1): 237-256.

O'Toole, Laurence J., Jr. 2015. "Networks and Networking: The Public Administrative Agendas." *Public Administration Review* 75(3): 361-371.

Paarlberg, Laurie E., and Sheldon Gen. 2009. "Exploring the determinants of nonprofit coproduction of public service delivery." *The American Review of Public Administration* 39 (4): 391–408.

Paarlberg, Laurie E., and Takayuki Yoshioka. 2016. "The Impact of Local Economic Structure on Community Philanthropy." *Public Administration Review,* 76(2): 340-350.

Pandey, Sandey K., Bradley E. Wright, and Donald P. Moynihan. 2008. "Public Service Motivation and Interpersonal Citizenship Behavior in Public Organizations: Testing a Preliminary Model." *International Public Management Journal*, 11(1): 89–108.

Parks, Roger B., Paula C. Baker, Larry Kiser, Ronald Oakerson, Elinor Ostrom, Vincent Ostrom, Stephen L. Percy, Martha B. Vandivort, Gordon P. Whitaker, and Rick Wilson. 1981.

"Consumers as Co-Producers of Public Services. Some Institutional and Economic Considerations." *Policy Studies Journal*, 9:7 pp1001–11.

Parks, R., and E. Ostrom. 1981. "Complex models of urban service systems," in Terry N. Clark (Ed.), *Urban Policy Analysis: Directions for Future Research. Urban Affairs Annual Reviews*, Vol. 21, pp. 171-199. Beverly Hills, CA: Sage Publications.

Parrado, Salvador, Gregg G. Van Ryzin, Tony Bovaird and Elke Loffler. 2013. "Correlates of Co-production: Evidence from a Five-Nation Survey of Citizens." *International Public Management Journal,* 16(1): 85-112.

Pattavina, A., J.M. Byrne, and L. Garcia. 2006. "An Examination of Citizen Involvement in Crime Prevention in High-Risk Versus Low- to Moderate-Risk Neighborhoods." *Crime & Delinquency*, 52: 203-231.

Peaslee, L. 2009. "Community policing and social service partnerships: lessons from New England." *Police Practice and Research*, Vol. 10, No. 2, 115–131.

Percy, Stephen L. 1978. "Conceptualizing and Measuring Citizen Co-Production of Community Safety." *Policy Studies Journal,* 7(s1): 486-293.

Percy, Stephen L. 1984. "Citizen Participation in the Coproduction of Urban Services." *Urban Affairs Review*, 19: 431-446.

Percy, Stephen L. 1987. "Citizen Involvement in Coproducing Safety and Security in the Community." *Public Productivity Review,* 10(4): 83-93.

Perry, James L., and Annie Hondeghem. 2008. *Motivation in Public Management. The Call of Public Service*. Oxford: Oxford University Press.

Peters, B. Guy, and John Pierre. 1998. "Government without Governance? Rethinking Public Administration." *Journal of Public Administration Research and Theory*, 8(2): 223–43.

Pestoff, Victor. 2006. “Citizens and Co-production of Welfare Services.” *Public Management Review*, 8(4): 503-519.

Pestoff, Victor. 2009. “Towards a Paradigm of Democratic Participation: Citizen Participation and Co-Production of Personal Social Services in Sweden.” *Annals of Public and Cooperative Economics,* 80(2): 197-224.

Pestoff, Victor. 2012. “Coproduction and Network Structures in Public Education.” In V. Pestoff, T. Brandsen, and B. Verschuere (eds.), *New Public Governance, the Third Sector and Co-production.* New York: Routledge.

Petrovsky, Nicolai. 2006. “Public Management Theory and Federal Programs: A Test Using PART Scores.” Paper presented at the conference on “Empirical Studies of Organizations and Public Management.” Texas A&M University, May 4–6.

Poister, Theodore H., Obed Q. Pasha, and Lauren H. Edwards. 2013. “Does Performance Management Lead to Better Outcomes? Evidence from the U.S. Public Transit Industry.” *Public Administration Review,* 73(4): 625-636.

Putnam, Robert D. 1993. “The prosperous community.” *The American Prospect* 4 (13): 35–42.

Putnam, Robert D. 2001. *Bowling alone: The collapse and revival of American community*. Simon and Schuster.

Quinton, P., and T. Rachel. 2007. “Neighbourhood Change: the Impact of the National Reassurance Policing Programme.” *Policing: A Journal of Policy & Practice*, Vol. 1 Issue 2, p.149-160.

Radnor, Zoe, Stephen P. Osborne, Tony Kinder, and Jean Mutton. 2014. “Operationalizing Co-Production in Public Services Delivery: The Contribution of Service Blueprinting.” *Public Management Review*, 16(3): 402–423.

Reed, Paul B., and L. Kevin Selbee. 2003. "Do People Who Volunteer Have a Distinctive Ethos? A Canadian Study", in P. Dekker and L. Halman (eds), *The Values of Volunteering. Cross-Cultural Perspectives*. New York, NY: Kluwer Academic/Plenum Publishers, pp91–109.

Reisig, M.D. 2010. Community and Problem-Oriented Policing. *Crime and Justice*, Vol. 39, No. 1: 1-53.

Ren, Ling, Jihong "Solomon" Zhao, Nicholas P. Lovrich, and Michael J. Gaffney. 2006. "Participation community crime prevention: Who volunteers for police work?" *Policing: An International Journal of Police Strategies and Management,* 29(3): 464-481.

Renauer, B.C., D.E. Duffee, and J.D. Scott. 2003. "Measuring Police-Community Co-production: Trade-offs in Two Observational Approaches." *Policing: An International Journal of Police Strategies & Management*, v. 26, no. 1, p. 9-28.

Rho, Eunju. 2013. "Contracting Revisited: Determinants and Consequences of Contracting Out for Public Education Services." *Public Administration Review,* 73(2): 327-337.

Riccucci, Norma M., Gregg G. Van Ryzin, and Huafang Li. 2015. "Representative Bureaucracy and the Willingness to Coproduce: An Experimental Study." *Public Administration Review*, 76(1): 121-130.

Riccucci, Norma M., and Gregg G. Van Ryzin. 2016. "Representative Bureaucracy: A Lever to Enhance Social Equity, Coproduction, and Democracy." *Public Administration Review,* DOI: 10.1111/puar.12649.

Robin, Gerald D. 2000. *Community policing: Origins, elements, implementation, assessment*. E. Mellen Press.

Robbins, Suzanne M. 2010. "Play Nice or Pick a Fight? Cooperation as an Interest Group Strategy at Implementation." *Policy Studies Journal*, 38(3): 515-535.

Rogers, D. L., G. L. Bultena, and K. H. Barb. 1975. “Voluntary Association Membership and Political Participation: An Exploration of the Mobilization Hypothesis.” *Sociological Quarterly* 16: 305-18.

Romzek, Barbara, and J. Stephen Hendricks. 1982. “Organizational Involvement and Representative Bureaucracy: Can We Have It Both Ways?” *American Political Science Review* 76(1): 75-82.

Rosenberg, Helen, Sigler, Robert T., and Lewis, Scott. 2008. “Police Officer Attitudes Toward Community Policing: A Case Study of The Racine Wisconsin Police Department.” *Police Practice & Research*. 9(4): 291-305

Rosentraub, Mark S., and Elaine B. Sharp. 1981. “Consumers as Producers of Social Services: Coproduction and the Level of Social Services.” *Southern Review of Public Administration* 4(4): 502–39.

Rosentraub, Mark S., and Karen S. Harlow. 1983. “Public/Private Relations and Service Delivery: The Coproduction of Personal Safety.” *Policy Studies Journal*, 11(3): 445-457.

Rosentraub, Mark S., and Robert Warren. 1987. “Citizen Participation in the Production of Urban Services.” *Public Productivity Review,* 41: 75-88.

Ryan, B. 2012. “Co-Production: Option or Obligation?” *Australian Journal of Public Administration* 71 (3): 314–324.

Ryu, Sangyub. 2016. “Modeling Public Management: Current and Future Research.” *Public Organization Review*, 16(1): 77-94.

Salamon, Lester M. 1987. “Of market failure, voluntary failure, and third-party government: Toward a theory of government-nonprofit relations in the modern welfare state.” *Nonprofit and Voluntary Sector Quarterly* 16:29-49.

Salamon, Lester M., and Helmut K. Anheier. 1998. “Social origins of civil society: Explaining the nonprofit sector cross-nationally.” *Voluntas: International Journal of Voluntary and Nonprofit Organizations* 9:213–48.

Salamon, Lester M.. 2000. “The New Governance and the Tools of Public Action: An Introduction.” *Fordham Urban Law Journal*, 28(5): 1611-1674.

Saltzstein, Grace. 1989. “Black mayors and police policies.” *Journal of Politics* 51: 525–44.Sampson, Robert J. 1988. “Local Friendship Ties and Community Attachment in Mass Society: A Multi-level Systemic Model.” *American Sociological Review,* 53: 766-779.

Saxton, Gregory D., and Michelle A. Benson. 2005. “Social capital and the growth of the nonprofit sector.” *Social Science Quarterly* 86:16–35.

Schafer, Joseph A., Beth M. Huebner, and Timothy S. Bynum. 2003. “Citizen Perceptions of Police Services: Race, Neighborhood Context, and Community Policing.” *Police Quarterly,* 6(4): 440-468.

Scheider, M.C., R. Chapman, and A. Schapiro. 2009. “Towards the unification of policing innovations under community policing.” *Policing: An International Journal of Police Strategies & Management*, Vol. 32 No. 4, pp. 694-718.

Schnebly, S.M. 2008. “The Influence of Community-Oriented Policing on Crime-Reporting Behavior.” Justice Quarterly, 25(2): 223-251.

Schneider, Anne L. 1987. “Coproduction of Public and Private Safety: An Analysis of Bystander Intervention, ‘Protective Neighboring’ and Personal Protection.” *The Western Political Quarterly,* 40(4): 611-630.

Schuck, Amie, Dennis P. Rosenbaum, and Darnell F. Hawkins. 2008. "The Influence of Race/Ethnicity, Social Class, and Neighborhood Context on Residents' Attitudes Toward the Police." *Police Quarterly,* 11(4): 496-519.

Scott, J.D. 2002. "Assessing the Relationship Between Police-Community Coproduction and Neighborhood-Level Social Capital." Journal of Contemporary Criminal Justice, 18: 147-166.

Sharp, Elaine B. 1980. "Toward a new understanding of urban services and citizen participation: The coproduction concept." *Midwest Review of Public Administration*, 14(2): 105-118.

Sharp, Elaine B. 1984. "Citizen-Demand Making in the Urban Context." *American Journal of Political Science*, 28:4 pp654–70.

Sharp, Elaine B. 2006. "Policing Urban America: A New Look at the Politics of Agency Size." *Social Science Quarterly.* Vol. 87 Issue 2, p. 291-307.

Sharp, Douglas, and Susie Atherton. 2007. "To Serve and To Protect? The Experiences of Policing in the Community of Young People from Black and Other Ethnic Minority Groups." *British Journal of Criminology*, 47: 746 – 763.

Siegel, Richard A., and Gilbert B. Sundeen. 1986. "The Uses of Volunteers by Police." *Journal of Police Science and Administration*, 14: 49-61.

Skolnick, J. H. 1966. *Justice without trial: Law enforcement in a democratic society*. New York: John Wiley.

Smith, David H. 1994. "Determinants of Voluntary Association Participation and Volunteering: A Literature Review." *Nonprofit and Voluntary Sector Quarterly,* 23: 243-263.

Smith, B.W., K.J. Novak, and J. Frank. 2001. "Community policing and the work routines of street-level officers." *Criminal Justice Review*, 26(1): 17-37.

Son, Neung-su. 2007. "A Study of Co-production in Police Services within the Patrol Division

System [Soonchal Jeegodae Chaejaehaeu Cheean Seobeesu Gongdong Saengsanae Gwanhan Yeongoo: Jeeyeok Kyeongchaleu InshikBoonsukeul Joongshimeuro].” *Hangook Jeongchaek Gwahak Hakhwaebo*, 11(2): 79-106.

Sparrow, Malcom. 1988. Implementing community policing. In *Perspectives on policing*. Washington, DC: National Institute of Justice.

Sundeen, Richard A. 1988. “Explaining Participation in Coproduction: A Study of Volunteers.” *Social Science Quarterly,* 69(3): 547-568.

Steen, Trui. 2006. “Public Sector Motivation: Is There Something to Learn from the Study of Volunteerism?” *Public Policy and Administration*, 21(1): 49–62.

Stritch, Justin M. 2016. “A Preliminary Examination of Citizen Orientation and Multiple Dimensions of Organizational Performance.” *International Journal of Public Administration,* 395(5): 345-358.

Tang, Chor Foon, and Hooi Hooi Lean. 2007. “Will Inflation Increase Crime Rate? New Evidence from Bounds and Modified Wald Tests.” *Global* ***Crime****.* Vol. 8 Issue 4, p. 311-323.

Taniguchi, H. 2012. “The determinants of formal and informal volunteering: Evidence from the American time use survey.” *Voluntas: International Journal of Voluntary and Nonprofit Organizations,* 23(4): 920-939.

Theobald, Nick A., and Donald P. Haider-Markel. 2009. “Race, Bureaucracy, and Symbolic Representation: Interaction between Citizens and Police.” *Journal of Public Administration Research and Theory*, 19(2): 409-426.

Thomas, M.O., and P.F. Burns. 2005. “Repairing the Divide: An Investigation of Community Policing and Citizen Attitudes Toward the Police by Race and Ethnicity.” *Journal of Ethnicity in Criminal Justice*, Vol. 3(1/2), p. 71-90.

Thomsen, Mette K. 2015. “Citizen Coproduction: The Influence of Self-Efficacy Perception and Knowledge of How to Coproduce.” *American Review of Public Administration*, 1-14.

Thomsen, Mette K., and Morten Jakobsen. 2015. “Influencing Citizen Coproduction by Sending Encouragement and Advice: A Field Experiment.” *International Public Management Journal*, 18(2): 286-303.

Timpone, Richard J. 1998. “Structure, Behavior, and Voter Turnout in the United States.” The *American Political Science Review*, 92(1): 145–58.

Trojanowicz, R. C. 1983. “An evaluation of a neighborhood foot patrol program.” *Journal of Police Science and Administration* 11: 410–419.

Vamstad, J. 2012. “Co-production and service quality: A new perspective for the Swedish welfare state.” In V. Pestoff, T. Brandsen, & B. Verschuere (Eds.), *New Public Governance, the Third Sector and Co-production.* New York: Routledge.

Van Eijk, C.J.A., and Trui Steen. 2014. “Why People Co-produce: Analyzing citizens’ perceptions on co-planning engagement in healthcare services.” *Public Management Review*, 16(3): 358-382.

Van Eijk, C.J.A., and Trui Steen. 2016. “Why engage in co-production of public services? Mixing theory and empirical evidence.” *International Review of Administrative Sciences,* 82(1): 28-46.

Van Looy, Bart, Paul Gemmel, and Roland Dierdonck. 2003. *Services Management: An Integrated Approach.* Pearson Education.

Van Ryzin, Gregg G. 2007. ‘‘Pieces of a Puzzle: Linking Government Performance, Citizen Satisfaction, and Trust.’’ *Public Performance & Management Review,* 30(4): 521–535.

Van Ryzin, Gregg G. 2011. ‘‘Outcomes, Process, and Trust of Civil Servants.’’ *Journal of Public Administration Research and Theory*, 21(4): 745–760.

Vargo, Stephen L., Paul P. Maglio, and Melissa A. Akaka. 2008. “On value and value co-creation: A service systems and service logic perspective.” *European Management Journal*, 26: 145-152.

Verba, Sidney, and Norman H. Nie. 1987. *Participation in America: Political Democracy and Social Equality*. University of Chicago Press.

Verba, Sidney, Key Lehman Schlozman, and Henry E. Brady. 1995. *Voice and Equality: Civic Voluntarism in American Politics*. Cambridge, MA: Harvard University Press.

Verschuere, B., T. Brandsen, T. and V. Pestoff, V. 2012. “Co-Production: The State of the Art in Research and the Future Agenda. *International Society of Third Sector Research* 23(4): 1083-1101.

Vollmer, August. 1936. *The Police and Modern Society*. College Park, MD: McGrath.

Vooberg, W. H., V. J. J. M. Bekkers, and L. G. Tummers. 2014. “A Systematic Review of Co-Creation and Co-Production: Embarking on the social innovation journey.” *Public Management Review*, 17(9): 1333-1357.

Walker, Samuel. 1980. *Popular Justice: A History of American Criminal Justice*. New York: Oxford University Press.

Walker, Richard, Laurence J. O’Toole Jr., and Kenneth J. Meier. 2007. “It’s Where You Are that Matters: An Empirical Analysis of the Networking Behaviour of English Local Government Officers.” *Public Administration*, 85 (3): 739–56.

Walker, Samuel. 2012. “Institutionalizing Police Accountability Reforms: The Problem of Making Police Reforms Endure.” *Saint Louis University Public Law Review*, 32(57): 57-91.

Warren, Robert, Karen S. Harlow, and Mark S. Rosentraub. 1982. “Citizen Participation in the Production of Services: Methodological and Policy Issues in Coproduction Research.” *The Southwestern Review of Management and Economic*, 2(3): 41-56.

Wehrman, Michael M., and Joseph De Angelis. 2011. “Citizen Willingness to Participate in Police-Community Partnerships: Exploring the Influence of Race and Neighborhood Context.” *Police Quarterly*, 14(1): 48-69.

Weisbrod, Burton A. 1977. The voluntary nonprofit sector: An economic analysis. Lexington, MA: Lexington Books.

Weisbrod, Burton A. 1991. *The nonprofit economy*. Cambridge, MA: Harvard Univ. Press.

Wenger, Jeffrey B., Laurence J. O’Toole Jr., and Kenneth J. Meier. 2008. “Trading Speed for Accuracy? Managing Goal Conflict and Accommodation in the U.S. Unemployment Insurance Program.” *Policy Studies Journal* 36 (2): 175–98.

Wherman, Michael M., and Joseph De Angelis. 2011. “Citizen Willingness to Participate in Police-Community Partnerships: Exploring the Influence of Race and Neighborhood Context.” *Police Quarterly,* 14(1): 48-69.

Whitaker, G. 1980. “Co-Production: Citizen Participation in Service Delivery.” *Public Administration Review* 40(3): 240-246.

Wilkins, Vicky M., and Brian N. Williams. 2008. “Black or Blue: Racial Profiling and Representative Bureaucracy.” *Public Administration Review,* 68(4): 654-664.

Wilson, Rick. 1981. “Citizen Coproduction as a Mode of Participation: Conjectures, Modes, and Cockroaches.” Workshop in Political Theory and Policy Analysis.

Wikstrom, Nelson. 1979. “The Mayor as a Policy Leader in the Council-Manager Form of Government: A View From the Field.” *Public Administration Review,* 39(3): 270-276.

Williams, B.N. 1998. *Citizen Perspectives on Community Policing: A Case Study in Athens, Georgia*. Albany: State University of New York Press.

Williams, Richard. 2006. "Gologit2: Generalized Ordered Logit/ Partial Proportional Odds Models for Ordinal Dependent Variables." *Stata Journal* 6(1): 58–85.

Williams, B.A., Kang, S.C., and J. Johnson. 2015. "(Co)-Contamination as the Dark Side of Co-Production: Public value failures in co-production processes." *Public Management Review*, DOI: 10.1080/14719037.2015.1111660.

Wilson, Orlando. W. 1950. *Police administration*. New York: McGraw Hill.

Wilson, James Q. 1968. *Varieties of police behavior*. Cambridge, MA: Harvard University Press.

Wilson, James Q. 1975. *Thinking About Crime*. Rev. ed. New York: Vintage Books.

Wilson, Rick K. 1982. "Citizen Coproduction as a Mode of Participation: Conjectures and Models." *Journal of Urban Affairs*, 3: 37-50.

Wolf, Ross, James F. Albrecht, and Adam Dobrin. 2015. "Reserve Policing in the United States: Citizen Volunteering for Public Service." *The Police Chief*, 82: 38-47.

Worrall, John L., and Tomislav V. Kovandzic. 2007. "COPs Grants and Crime Revisited." *Criminology,* 45(1): 159-190.

Worrall, John L. 2008. "The Effects of Local Law Enforcement Block Grants on Serious Crime." *Criminology & Public Policy*, 7(3): 325-350.

Worrall, John L., and Tomislav V. Kovandzic. 2010. "Police Levels and Crime Rates: An Instrumental Variables Approach." *Social Science Research*, 39: 506-516.

Young, Dennis R. 2000. "Alternative models of government-nonprofit sector relations: Theoretical and international perspectives." *Nonprofit and Voluntary Sector Quarterly* 29:149–172.

Zhao, Jihong “Solomon”, Ni He, and Nicholas P. Lovrich. 2003. “Community Policing: Did It Change the Basic Functions of Policing in the 1990s? A National Follow-Up Study.” *Justice Quarterly*, 20(4): 697-724.