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Equity and Coproduction: Exploring the Link between Socioeconomic Status and Willingness to Coproduce

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Abstract: Coproduction is broadly defined as the active involvement of service users in the production of public services. Amidst a growing body of research examining who coproduces and why, there are gaps in our understanding about whether those who have the greatest need for public services are coproducing effectively due to limitations such as historical inequities or high costs of involvement. Moreover, there is little research about what factors along the coproduction process mediate the relationship between socioeconomic status and motivations to coproduce. To explore this issue, this study analyzes individual level data from a national random sample survey of individuals who contacted the police. We use structural equation modeling to examine the relationship between socioeconomic status, respondents' perceptions of their interaction with the police, and willingness to contact police in the future. Our analysis reveals that race alone is not a determinant of willingness to coproduce. However, we find that black citizens who have more frequent contact with the police are less likely to indicate their willingness to contact the police again. This relationship between race and willingness to coproduce is not direct but mediated by respondents' attitudes formed during prior interactions with the police. These findings suggest that socioeconomic status serves as a factor that limits the effective participation of some groups in coproduction processes.

1. Introduction

The efficient and effective delivery of public services is an important function of local governments. The concept of coproduction entails a service delivery arrangement in which service users jointly produce public services with regular producers (Nabatchi, Sancino, and Sicilia 2017). Coproduction has attracted global appeal and has been applied in a range of public policy domains, for instance: public health and elderly care (Buffel 2018, Dunston et al. 2009, Ewert and Evers 2014, Hyde and Davies 2004); environmental conservation and global sustainability (Homsy and Warner 2013, Lemos and Morehouse 2005); economic planning and development (Perry and Atherton 2017, Watson 2014); public educational services (Hubbard et al. 2017, McCulloch 2009); and public safety and public order (Marschall 2004, Innes et al. 2011, Williams et al. 2016).

While coproduction has the potential to generate benefits for both government and citizens such as cost savings, enhanced service quality, and improved community relations, scholars have highlighted an important issue concerning possible inequities in coproduction processes. It pertains to the question of which citizens are more likely to participate and ultimately benefit from coproduction (Brandsen and Honingh 2016, Jakobsen and Andersen 2013, Thomsen and Jakobsen 2015). Studies have noted how service users of higher socioeconomic status (SES) may engage in coproduction more than those of lower SES and, consequently, reap a greater portion of the benefits (Clark, Brudney, and Jang 2013, Jakobsen and Andersen 2013, Ostrom 1996, Thomas and Burns 2005, Warren, Rosentraub, and Harlow 1984, Williams, Kang, and Johnson 2016). This issue has direct implications for equity, public trust, and accountability (Van Ryzin 2011). If lower SES citizens are unable to participate meaningfully in coproduction processes, the gains from coproduction may accrue to higher SES citizens so that coproduction outcomes are less beneficial for society overall.

While the literature has explored factors that are associated with who coproduces and why (see,

e.g. Parrado et al. 2013, Uzochukwu and Thomas 2018, Van Eijk and Steen 2014, Van Eijk and Steen 2016, Voorberg et al. 2018), little research has probed into the coproduction process to examine what kinds of unknown, or known but untested, factors may mediate the link between SES features and motivations to coproduce. For instance, studies discuss how minority residents' experiences with contacting the police are associated with negative attitudes toward the police (Schuck, Rosenbaum, and Hawkins 2008). However, there are few studies that empirically test the causal mechanisms behind how such attitudes mediate the link between race and willingness to coproduce in the future (Wehrman and De Angelis 2011). This is due, in part, to statistical difficulties in modeling them precisely.

To address this gap in our understanding, we expand on existing research by examining how the willingness to coproduce is influenced by the characteristics of service users and the attitudes that are shaped from the direct experiences of interacting with regular producers. For this study, we focus on minority status, specifically race, as a major factor that may negatively shape the attitudes and experiences of socioeconomically disadvantaged service users. Racial volatility has constituted a perennial issue in the United States and has important ramifications for government service delivery. For instance, in recent years a number of high-profile negative encounters between police officers and minority citizens have occurred in various parts of the country and have led to civil unrest due to some of these incidents resulting in the deaths of unarmed citizens. These encounters recall the memories of historic harms that marginalized populations were subjected to by law enforcement and serve as visible reminders of the precarious state and volatile nature of race relations long into the twenty-first century (Davis, Lyubansky, and Schiff 2015). Such negative police-citizen interactions have the potential to diminish public trust and confidence. When coupled with the historical problematic realities that persist along racial lines, the resulting sentiments from negative interactions pose significant challenges for local law enforcement

agencies and their oversight governments when seeking to involve community residents in the coproduction of public services (Cordner 2014, Thomas 2013).

Drawing from individual-level data from a national random sample survey of individuals who contacted the police, we use a structural equation model to explore how racial minorities' past experiences of interacting with the police shape their attitudes toward the police and, in turn, how these attitudes influence the likelihood of contacting the police in the future. In sum, we seek to answer the following two questions. First, to what extent does the race of the service user and their coproduction experiences shape their attitude towards regular producers? Second, how do these perceptions shape their willingness to coproduce again?

The article proceeds as follows. We first review the coproduction concept and discuss the relevance of equity in coproduction processes. Next, lacking prior coproduction studies on direct experiences with service agents, we draw from the criminal justice and policing literature to supplement the literature on motivations to coproduce within the domain of law enforcement.[1] The subsequent sections discuss the data and methods and the analysis and findings. We conclude with a discussion of implications for coproduction research and practice as well as research limitations.

2. Literature Review

What is Coproduction

Amidst the variety of definitions advanced by the burgeoning coproduction literature, they have in common the active involvement of lay citizens with paid service agents in the design, and especially the delivery, of services. As Parks et al. (1981) first proposed, coproduction conceives of the active participation of citizen "consumer producers" working with "regular producers" or paid government service agents to deliver public services. To Bovaird and Löffler (2015) the most

[1] The terms law enforcement, policing, public safety, and public security will be used interchangeably throughout this article.

distinctive aspect of coproduction is that it conceives of citizens adding value to the activities of the public sector. They propose the definition that coproduction is "public service professionals and citizens making better use of each other's assets, resources and contributions to achieve better outcomes or improved efficiency" (Bovaird and Loeffler 2012, 1121).

Bovaird and Löffler (2015) illustrate many phases of the service cycle in which citizens may work with paid government officials to contribute to services, including co-commissioning, co-designing, co-producing, co-managing, and co-assessing. To capture the diversity of the involvement of citizens in public services, contemporary definitions of coproduction often introduce typologies of this activity. A prominent example is the one forwarded by Brandsen and Honingh (2016, 431) who define coproduction as "a 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". In addition to these "basic elements of coproduction," these authors identify two variable elements from which they construct a typology of coproductive activity: the extent to which citizens are involved not only in the implementation but also in the design of organizational services, and the proximity of the tasks that citizens perform to the core services of the organization (p. 432). Citizens may benefit directly as recipients of these services or as members of the larger community.

Nabatchi, Sancino, and Sicilia (2017, 769) define coproduction "as an umbrella concept that captures a wide variety of activities that can occur in any phase of the public service cycle and in which state actors and lay actors work together to produce benefits." As with Brandsen and Honingh (2016), these researchers propose a typology of coproduction, in their case, based on the "level" or extent of the local citizenry involved in coproduction (individual, group, or collective) and the phase of the service cycle in which they are involved (commissioning, design, delivery, or assessment).

Several reasons underlie the reemergence of coproduction in both academic and practitioner circles. While coproduction is not an entirely new idea (Brudney and England 1983, Parks et al. 1981, Whitaker 1980), the increasing and widespread attention in recent years is part of the emerging paradigm of new public governance which focuses on the collaborative and participative aspects of public service production (Alford 2009, Bovaird 2007, Brandsen and Pestoff 2006, Osborne 2010, Osborne, Radnor, and Strokosch 2016). This academic resurgence has been accompanied by a practical shift in the way public agencies organize themselves and perceive their role in the service delivery system. For instance, as privatization has shifted the centrality of service delivery from agency professionals to other organizations (Perry 2007), professionals have had to readjust their roles as they increasingly find themselves in the midst of complex networks and communities of different actors (Brandsen and Honingh 2013).

Coproduction and Equity

While coproduction has the potential to generate several benefits for both public agencies and service users, scholars have raised questions about inequities in coproduction processes. Equity and fairness are integral to governmental processes which has both economic and political consequences for public service delivery (Van Ryzin 2011). They concern the fact that those with more resources are able to contribute more to the production process, thereby reaping more benefits compared to those with less resources to invest. They also point to the problem of those who have the greatest need for public services may be limited in their capacity to participate due to historical inequities or other barriers. Such differences in the resources available to coproduce can exacerbate gaps in participation between advantaged and disadvantaged groups, resulting in unequal distribution of benefits.

Early scholars addressed some of these issues. Whitaker (1980) discussed how service agents should not adhere to requests for special treatment or favors because they constitute unfair privileges or a failure to enforce rights and duties. Rosentraub and Sharp (1981) addressed equity in more depth by analyzing several empirical studies of policing and healthcare services, and noted how "wealthier, better-educated, or non-minority citizens may be more willing or able to engage in coproduction activities" (1981: 517). Brudney (1983) examined the different costs that citizens must bear in order to coproduce effectively. Direct opportunity costs include time, energy, money, foregone earnings or financial opportunities, and psychological factors such as self-efficacy that can encourage or discourage future participation. Another cost pertains to the learning process. Citizens must possess sufficient knowledge of the technologies employed in service delivery, the organizations involved in service provision, and the heterogeneity of actors and interests involved to coproduce effectively. However, the resources necessary to incur these costs are not distributed evenly across different populations. Citizens with greater wealth and education have more resources and better access to information about the service being produced. If government reliance on service user coproduction increases, this could exacerbate service inequalities since those with greater resources are in a better position to contribute more to service levels (Warren, Rosentraub, and Harlow 1984). Not only is the quality and quantity of services affected, but governments may become less responsive to those with fewer resources.

Recent literature on coproduction motivations provide additional insight about the incentives that underlie different types of coproducers and how it affects equity. Alford (2002) explains how different coproducers such as citizens, clients, and volunteers are motivated by different incentives. Clients retain a direct material interest in their relationship with an organization. That is, they receive private value in the form of goods and services. Citizens also receive value from public organizations, but they do so collectively, thereby assuming the form of public value. Volunteers

do not receive goods or services as compensation for their efforts but rather, are largely driven by internal factors such as humanitarian values or altruistic concerns, although this may vary depending on the type of volunteer (Clary, Snyder, and Stukas 1996). On the one hand, the specific values and motivations undergirding each category depends on the unique relationship with the type of coproducer and the producing agency as well as the type of service involved. However, if coproduction primarily involves goods and services that users directly consume (Parks et al. 1981) and if contributions toward public goods rarely occur without incentives or coercion (Olson 2009), then service users who have a significant material interest in participating will most likely coproduce. If so, then those with greater resources will be better situated to contribute to and benefit more from coproduction processes.

This leads to the question of whether citizens who have an interest and need to coproduce but who lack the resources to do so can participate effectively. Scholars have discussed the difficulty of mobilizing citizens due to the costs of participating (Clark, Brudney, and Jang 2013, Rosentraub and Sharp 1981), raising the question of how to motivate disadvantaged citizens to coproduce. Some have suggested different strategies that governments could employ to defray some of the costs. Examples include information strategies to enlighten users, facilitation strategies to make implementation easier, regulatory strategies that mandate certain activities and sanction those who do not comply, and incentives that increase the attractiveness of adopting coproductive behaviors (Brudney 1983). In addition, governments could design coproduction programs in a way that deliberately aims to reach certain groups or enhance the coproduction of a particular service. Recent empirical studies have explored some of these issues. Jakobsen (2012) demonstrates how some government initiatives can increase citizen coproduction among those with the greatest need for the service. Jakobsen and Andersen (2013) also discuss how coproduction programs designed

to lift constraints on disadvantaged citizens could have a substantial positive impact on service outcomes of disadvantaged children.

However, some barriers may still be difficult to overcome even with government initiatives to rectify them. Williams, Kang, and Johnson (2016) discuss the notion of public value "co-contamination" which refers to the misuse or misallocation of resources that occur either accidentally or intentionally in the process of interactions between service providers and service users. One instance of *intentional* misuse by service providers is when public employees abuse their positions of authority or stigmatize certain groups of individuals who have a stake in coproducing. An example of *accidental* misallocation by service users is when citizens are limited by social conditions or cognitive barriers to fully utilize their abilities, resulting in decreased user input. Such "co-contamination" may exacerbate the difficulty of government interventions to improve coproduction processes.

In sum, studies have addressed issues of equity in coproduction processes and outcomes, and some have addressed ways that government could design coproduction programs with a focus on disadvantaged citizens. However, there are a variety of methodological limitations pertaining to the lack of agreement on the definition of equity, different approaches to measuring the level and quality of services, discretionary authority of street-level bureaucrats, and the behaviors of citizen that complicate measurement (Rosentraub and Sharp 1981). Other issues include the need for more information on how citizens contribute to coproduction processes, the relative impact of coproduction activities on service levels, and the overall outcomes for the community. In addition, some may have more resources but not necessarily use them for coproduction, whereas others have less resources but may actively engage in coproduction due to demand dissatisfaction (Ferris 1988). Although we cannot address all these issues, this study aims to contribute to the production of such knowledge by exploring the issue of equity in one major policy realm below.

3. A Conceptual Model of Citizen Attitudes and Willingness to Coproduce: The Case of Law Enforcement

We turn to the realm of law enforcement and policing as the empirical case to further elucidate the problem of equity in coproduction processes. This is an early policy realm in which public administration scholars observed coproduction processes and began to elaborate upon its significance (Ostrom, Parks, and Whitaker 1973, Ostrom and Whitaker 1973, Ostrom, Parks, and Whitaker 1974). While substantial research has been conducted on coproduction in law enforcement during early periods (Percy 1978, 1987, Warren, Rosentraub, and Harlow 1984, Rosentraub and Sharp 1981, Warren, Harlow, and Rosentraub 1982), this realm has not attracted rigorous attention among more recent coproduction scholarship.

Recent criminal justice literature contains some work on this topic. Innes et al. (2011) discuss how citizens may coproduce public safety through two basic collaborative modes. According to their classification, type 1 coproduction refers to citizens actively contacting the police about public safety issues and the police responding to such citizen-initiated contacts. Type 2 coproduction entails the police identifying an issue and involving the community to deal with it through direct material or practical support or through more tacit forms, such as neighborhood watch programs. Whether it be through citizen-initiated contacts (type 1) or through police-initiated contacts (type 2), the commonality of both modes of coproduction is that citizens supply direct input to the process of producing community safety.

The traditional view of government service delivery is that the police are expected to handle problems of crime and public safety, especially since government has authority over the use of legal force in maintaining law and order. However, both coproduction and criminal justice studies on community policing argue that the active involvement of local citizens is crucial in addressing public safety because the police alone cannot produce public safety (Ren et al. 2006, Smith and

Alpert 2011, Percy 1978). Citizens must proactively supply critical information because the police are limited in their ability to respond to crime effectively if responders are not aware of incidents occurring in the first place. Service inputs must be supplied by both citizens and the police, so that the two assume an interdependent relationship in which no output can be obtained without inputs from the other (Parks et al. 1981).

Ideally, this interdependent relationship between the police and citizens should function to maximize benefits for both parties. However, from the perspective of equity, lower socio-economic status constitutes a potential factor that could have negative distributional consequences for coproducing public safety. Among these factors, race is a major historical element associated with both the intentional and accidental misuse of resources. Race relations have affected the way police agencies perceive of and interact with minority communities, especially African American citizens. This has had major negative repercussions for the way racial minorities view the police and engage in coproducing public safety. Conflict between the police and minorities has a long history that dates back prior to the emergence of urban law enforcement in the United States (Mann 1993, Reichel 1988, Turner, Giacopassi, and Vandiver 2006), and persists even today as witnessed by negative incidents involving police officers and minority males and the civil unrest that ensued in various parts of the country (Ward and Menifield 2017). Generally, race relations shape the manner in which individuals view each other and their behaviors, leading to divisions among groups and individuals (Tuch, Sigelman, and MacDonald 1999). Studies have shown how racial animosity is widespread and endures and how it can influence views about criminal justice issues (Schuman et al. 1997, Sigelman and Tuch 1997). For example, ideals of fairness in the criminal justice system are dictated by the way opposite races view one another (Hurwitz and Peffley 2005), and these issues have been explored by studies on racial profiling (Rice, Reitzel, and Piquero 2005).

In the context of coproduction, race relations have shaped how African Americans perceive of the police and their role in coproducing public safety. While studies have shown how Americans in general hold positive attitudes toward the police, scholars have argued how there are differences in attitudes across individuals from different backgrounds and communities, especially among minority racial and ethnic groups (Huang and Vaughn 1996, Pastore and Maguire 2007). Consequently, we propose the following hypothesis:

H1: Black citizens are less likely to coproduce public safety compared to Americans in general.

However, to better understand the link between race and willingness to coproduce, we move beyond generalizations based on historical inequities and further explore how attitudes derived from actual coproduction experiences, such as the way in which police respond to crime victims' needs or requests, affect their willingness to coproduce in the future.

Empirical studies in the criminal justice literature have found that direct experiences are associated with attitudes towards the police (Reisig and Parks 2000, Rosenbaum et al. 2005, Schuck and Rosenbaum 2005, Skogan 2005, Schuck, Rosenbaum, and Hawkins 2008). They find that residents reporting recent and more frequent contact with the police generally possess more negative views of the police compared to residents who do not have such contact. However, some argue that the level of dissatisfaction is highly contingent upon who first initiated the contact. When comparing voluntary (citizen-initiated) versus involuntary (police-initiated) contacts, due to the nature of the contact, voluntary or citizen-initiated contacts tended to be more positive, whereas involuntary or police-initiated contacts tended to be more adversarial (Decker 1981, Skogan 2005).

Other research has found that citizens who report being a victim of a crime describe being less satisfied with the police (Circo, Melde, and Mcgarrell 2018, Lai and Zhao 2010, Lytle and Randa

2015). This may be amplified in minority communities in which there may be variations in the way police respond to victims' requests for services. For instance, when police response is slower or if there is lack of information sharing as well as less support and service provision, victims may be less satisfied. Perceptions of mistreatment or disrespect during a police contact may also contribute to dissatisfaction with the police. Studies discuss how citizens' satisfaction with the police depend on how they were treated by officers during a police contact, such as whether the officers were polite, helpful, attentive, and fair during the interaction (Skogan 2005). This suggests that a significant portion of differences in satisfaction with the police among different racial groups may be explained by differences in perceived treatment by the police.

Considering that issues of mistreatment and disrespect may be highly relevant in the context of racial and ethnic minorities' attitudes toward the police, the overall evidence indicates that minority citizens' direct experiences with the police may be generally associated with more negative perceptions or attitudes toward the police. However, the degree of dissatisfaction will vary depending on the nature of the citizen-police interaction, the reason for the contact, and residents' perceptions of treatment by the police during the contact (Schuck, Rosenbaum, and Hawkins 2008). Repeated contact with the police may also effect perceptions of legitimacy and evaluations of the police (Theobald and Haider-Markel 2008). Although data limitations preclude us from being able to test all of these assumptions, we propose the following two hypotheses to explore how minorities' experiences with coproducing public safety affect their attitudes toward the police and their willingness to contact the police in the future.

H2: Black citizens who experienced contacts with the police that were perceived as negative are more likely to hold negative attitudes toward the police.

H3: Black citizens who hold negative attitudes toward the police are less willing to coproduce in the future.

(Insert Figure 1 about here)

Figure 1 summarizes the conceptual model of this study as expressed in the hypotheses formulated above. While we assume that race is an important socioeconomic feature that may be directly associated with the willingness to coproduce, we expect that attitudes toward the police might have possible indirect effects by mediating the relationship between race and willingness. Control variables include several demographic and neighborhood contextual factors.

4. Data and Methods

We draw data from the Bureau of Justice Statistics' (BJS) 2015 Police-Public Contact Survey (PPCS) (U.S. Department of Justice 2015). The unit of analysis and observation for these data is an individual. A supplement to the National Crime Victimization Survey (NCVS), the PPCS provides detailed information on the nature and characteristics of contacts between police and the public, including the reason for and outcome of the contact and the respondent's satisfaction with the contact. In addition to questions about contact with the police, the survey contains extensive data on the demographic characteristics involved in the police contacts. For instance, the survey asks questions about the respondent's race, officer race at the time of the incident, and other relevant citizen demographic variables such as gender, age, whether the respondent resided in a core-based statistical area (CBSA), income, and population.

The PPCS collects information on contact with the police during a 12-month period, and collects data from a nationally representative sample of U.S. residents age 16 or older. The response rate was 95% (70,959 respondents of the 74,995 eligible). The first PPCS was conducted in 1996 by the Bureau of Justice Statistics (BJS), and to date, the PPCS has been conducted periodically about every 3 years. According to the most recent 2015 version, about 21.1% of the public had one or more contacts with the police including requests for services, being stopped or approached by the police (U.S. Department of Justice 2018).

Dependent Variable

For the variable pertaining to the willingness to coproduce, the PPCS contains the following question that asks each respondent, based on their most recent contact with the police, about their willingness to coproduce in the future: "Would you be more likely, less likely, or just as likely to contact the police in the future?" Responses were recorded on a three-point scale (from 1=*less likely to call* to 3=*more likely to call*, with "*don't know*" excluded, as recoded by the author so that a higher score corresponds with a greater likelihood). We express this as *willingness to contact police in the future*. As the frequencies in figure 2 illustrate, among the respondents who answered the question of their likelihood of contacting the police in the future, respondents overall tend to express their willingness to just as likely (67%) or more likely (24%) to contact the police in future. Only about 5% of respondents said they are less likely to contact the police in the future. Observing the racial composition of respondents (figure 3), we see that nearly 86% consisted of white citizens, while about 8% of respondents were black citizens, and 6% were of other races.

(Insert Figure 2 about here)

(Insert Figure 3 about here)

Independent and Control Variables

Since our main focus of SES is the race of the individual who contacted the police, we include a variable coded one if the respondent was black and zero if otherwise. We also include a variable coded one if the respondent was white and zero if otherwise. Concerning coproduction activities, we include variables for the number of times a respondent contacted the police for help.[2] Specifically, we include two separate continuous variables for (1) the number of times a respondent reported any kind of crime, disturbance, or suspicious activity to police, and (2) the number of times a respondent reported a non-crime emergency such as traffic accident or medical emergency to police. Using these two measures, we create two interaction variables for the number of times a black citizen contacted the police to report a crime or a non-crime emergency, respectively. We estimate two separate models based on these two different measures.

We include additional demographic and neighborhood-contextual variables that may influence their attitudes toward the police. These are additional reflections of SES of the respondents. These variables include gender coded one if the respondent was male; age (continuous); employment status coded one if the respondent was employed; a variable coded one if the respondent resided in a core-based statistical area (CBSA) and in a principal area; a variable coded one if the

[2] For this study we only examine citizen-initiated contacts. Regarding police-initiated contacts, some fit the definition of a type 2 coproduction activity (i.e. police sought information from the respondent), while others do not if some citizens were stopped because the police suspected the respondent of a crime or matched the description of someone the police were looking for. For the variables we use for this study, it is difficult to determine the nature of the police-initiated contact.

respondent resided in a CBSA but not in a principal area; income; and population. For income, we include three dummy variables: the first coded one if the respondent's income was below $25,000 and zero if otherwise; the second coded one if the respondent's income was between $25,000 and $50,000; the third coded one if the respondent's income was between $50,000 and $75,000. We expect that respondents who are of lower income will be more likely to have negative attitudes toward the police and therefore, less likely to coproduce. We include three dummy variables for population as well: the first coded one if the respondent resided in a jurisdiction with a population between 100,000 and 500,000; the second coded one if the respondent resided in a jurisdiction with a population between 500,000 and 1 million; and the third coded one if the respondent resided in a jurisdiction with population above 1 million. We expect that residents who reside in larger jurisdictions will be more likely to possess negative attitudes toward the police (Theobald and Haider-Markel 2008), and thus, less likely to coproduce.

Minority residents may come to view the police as responsible for socio-economic conditions or might transfer negative perceptions of general government services to the police (Reisig and Parks 2000). Also, larger and more urban neighborhoods are susceptible to conditions such as crime, gang and drug activity, physical decay, social disorder and other indicators of fear of crime which may shape residents' attitudes toward the police (Babor et al. 2010, Lanier 2018). Schuck, Rosenbaum, and Hawkins (2008) discuss how these factors have prompted African-Americans to report more negative views compared to that of Whites in many of these categories, prompting us to expect that these variables will lead to less willingness to coproduce.

Estimation Method

To test the conceptual model of the relationship between race, attitudes toward the police, and willingness to coproduce, we use a recursive structural equation model (SEM) using Stata 15.

Unlike conventional regression analysis that requires us to analyze the relationships between independent and dependent variables one layer at a time, structural equation modeling allows us to estimate the relationships between multiple independent and dependent constructs simultaneously in one single step (Kline 2005). In addition, the model allows for the analysis of latent constructs and multiple dependent variables and the examination of variables that are both dependent and independent variables at the same time.

Since most of the variables in the model are dichotomous or categorical variables, we apply a quasi-maximum likelihood estimation procedure that controls variables with non-normal distributions by adjusting for standard errors (StataCorp 2015). The shortcoming of this procedure is that it only derives the standardized root mean square residual (SRMR) and the coefficient of determination (CD), akin to R^2 in linear regression, as measures of goodness of fit. Meanwhile, this procedure engages in a list-wise deletion of missing values. Although the total survey sample consists of 70,959 respondents, we only focus on those who had one or more contacts with the police and who gave their response regarding their willingness to contact the police in the future. For this set of respondents, we use a final sample of 6,432 observations. Table 1 reports the descriptive statistics for all the variables used in the structural equation model.

(Insert Table 1 about here)

5. Analysis and Findings

The Attitudes Construct

Since we employ structural equation modeling, we first present the properties of the latent variable in the model, *attitudes toward the police*. This single construct is the result of a factor analysis with five manifest indicator variables that measure respondents' perceptions about the process or outcomes of their most recent experience with contacting the police. The full yes or no questions were phrased as follows.

1. Did the police respond promptly to your request?
2. Did the situation improve after you contacted the police?
3. Were you satisfied with the police response during your most recent contact?
4. Do you believe the police spent an appropriate amount of time with you?
5. Looking back on this contact, do you feel the police behaved properly?

Responses to each question were recoded as dichotomous variables with "don't know" responses excluded. The set of items representing overall *attitudes toward the police* was factor analyzed using a tetrachoric technique since all items are dichotomous. All five items listed above loaded positively on the first factor (eigenvalue 3.55). The standardized factor loadings are listed in table 2. Since the factor scores are standardized, one unit is equivalent to one standard deviation. Three of the items produced very high standardized factor loadings, namely, *satisfaction with police response*, *appropriate amount of time*, and *behaved properly* (0.718, 0.871, and 0.878). Somewhat lower, but still relevant is the standardized factor loading for the item *prompt response* (0.542). Finally, the standardized factor loading for *situation improved* is the lowest (0.371), but still lies above the threshold of 0.3 so that it could still be considered meaningful (Brown 2014).[3] In the

[3] One reason for this low factor loading is that unlike other questions which ask about processes such as treatment or response by the police, the question for *situation improved* gauges the outcome of the contact. Circumstances during the incident may have been overwhelming so that the outcome may not necessarily be attributable to the police officer(s) who handled the incident. For instance, during response to a crime scene, officer response and treatment of

structural equation model, we use this factor analyzed indicator to create an interaction variable to gauge the attitudes of black citizens.

(Insert Table 2 about here)

Structural Equation Model

The latent variable *attitudes toward the police* serves as a mediator variable in the model. The structural equation model allows us to identify and estimate the direct as well as indirect effects from the exogenous (independent) variables to the dependent variable, while accounting for the influence of service users' attitudes toward the police (latent construct) as a mediating variable. The path analysis model is depicted in figure 4.

(Insert Figure 4 about here)

Since the model uses a quasi-maximum likelihood estimation procedure, we examine the SRMR and the CD to determine the goodness of fit of the model to the empirical data. Given that the threshold for a good fit is generally set at SRMR <.08 (Kline 2005), the SRMR for our first model estimates (report crimes, disturbance, or suspicious activity) reveals a value of 0.010, while the SRMR for our second model estimates (report non-crime emergency) shows a value of 0.011.

residents may have been satisfactory. However, if multiple suspects were involved and several of them fled the scene, then officers' capacity to pursue all suspects may have been limited.

However, the value of CD for the first model is 0.067, while the value of CD for the second model is 0.094, suggesting weak predictive accuracy in explaining the variance in the endogenous construct for the structural model.[4]

We present the results of the first model which examines respondents' contact with the police to report a crime, disturbance, or suspicious activity. The direct effects of the exogenous variables on the latent factor *attitudes toward the police* is presented in table 3.

(Insert Table 3 about here)

(Insert Table 4 about here)

The estimates reveal that only the number of contacts, the interaction variable, income below $25,000, and population between 100,000 and 500,000 have a statistically significant direct effect at the .10 significance level. We find that as respondents have more frequent contact with the police, they are more likely to hold negative attitudes toward the police (unstandardized coefficient of -0.012). The effect size is greater for the interaction between black citizens and number of contacts (-0.118). Although we find that the variable for black citizen by itself is not statistically significant, the interaction indicates that black citizens who had multiple contacts with the police

[4] One reason for a low CD could be due to an inherently higher amount of unexplained variability such as the difficulty of predicting respondents' attitudes based on mostly demographic and neighborhood contextual variables. A solution would be to add more variables to the model, but this is infeasible given data limitations. Meanwhile, despite a low CD, the significant p-values may still indicate a real and meaningful relationship between the explanatory and response variables (Ott and Longnecker 2015).

were significantly more likely to hold negative views of the police. Meanwhile, respondents who are of low income are more likely to be associated with negative attitudes toward the police (-0.062), while those who reside in smaller jurisdictions are more likely to possess negative views of the police (-0.084).

While these direct effects are illustrated by the arrows in figure 4, indirect effects are not depicted graphically.

(Insert Figure 4 about here)

Indirect effects presented in table 4 are the product of two path coefficients representing the path from an independent variable to the mediating construct and ultimately to the dependent variable, which is the willingness to coproduce.[5] In this stage, we also include the interaction between black citizens and attitudes toward the police. Although most of the explanatory variables are not statistically significant, we find that the indirect path from the interaction between black citizens and number of contacts to the dependent variable is statistically significant. This indicates that black citizens who had multiple contacts with the police were significantly more likely to hold negative views of the police and thereby, less willing to coproduce (-0.024). The variables for income below $25,000 (-0.026) and population between 100,000 and 500,000 (-0.035) also indicate a statistically significant indirect effect on less willingness to coproduce.

[5] We multiply the coefficient for the effect of a manifest variable on the latent variable to the coefficient for the effect of the latent variable on the dependent variable. For instance, in table 4 the unstandardized coefficient for *white citizen* in table 3 is -0.014 while the effect size for *attitudes toward the police* on *willingness to contact police in the future* is 0.422. The product is as follows: -0.014*0.422 = -0.006.

Finally, the total effects, which are the sum of direct effects and indirect effects through the latent variable, are presented in table 4 as well. Here we only find two variables that are statistically significant on willingness to coproduce: age and residence in a CBSA but not in a principal area. Both variables display a positive effect on willingness to coproduce, suggesting that for total effects older individuals and those who live in large cities but outside of the principal area are more willing to contact the police in the future.

We turn to the second model which examines respondents' contact with the police to report a non-crime emergency.

(Insert Table 5 about here)

(Insert Table 6 about here)

For the direct effects of the exogenous variables on the latent factor *attitudes toward the police* (table 5), the estimates show that only three are statistically significant: number of contacts, employment status, and income below $25,000. In contrast to the first model which analyzes crime emergencies, respondents who report more frequent contact about non-crime emergencies are more likely to hold positive attitudes of the police. Those who are employed are more likely to have positive attitudes toward the police, while those who are of low income tend to display more negative attitudes.

For the indirect effects in table 6, no variables are statistically significant indicating that the latent variable does not serve to mediate the link between any of the variables and willingness to coproduce. It appears that the underlying dynamics involved in the willingness to report non-crime emergencies as opposed to reporting crimes may be different. For the total effects, only the variable for income between $25,000 and $50,000 is statistically significant.

6. Discussion and Conclusion

The involvement of service users in public service production and delivery has the potential to generate benefits such as cost savings, enhanced service quality, and improved community relations. Ideally, participants from all walks of society should be able to coproduce without any major barriers so that the benefits can be enjoyed equally as well. However, prior studies have raised the concern that service users of higher socioeconomic status may be better positioned to coproduce public services, and ultimately, benefit more from coproduction processes (Clark, Brudney, and Jang 2013, Jakobsen and Andersen 2013, Ostrom 1996, Thomas and Burns 2005, Warren, Rosentraub, and Harlow 1984, Williams, Kang, and Johnson 2016). While it is generally assumed that lower socioeconomic status is associated with less willingness to coproduce, little is known about how attitudes based on direct experiences with regular producers serve to mediate the relationship between socioeconomic status and motivation. The goal of this study was to enhance our understanding of this relationship using a structural equation model to explore how racial minorities' past experiences with contacting the police shapes their attitudes toward the police and, in turn, how these attitudes affect the likelihood of contacting the police in the future.

From the results of the respondents who reported a crime, disturbance or suspicious activity, we find that more frequent contacts with the police are associated with more negative attitudes toward the police. While race alone is not a determinant of either negative attitudes toward the police or

less willingness to contact the police, black citizens who contacted the police more frequently tend to hold more negative attitudes as well (hypothesis H2). Through structural equation modeling, we find that this latent variable serves to mediate the link between race and willingness to contact police in the future, thereby supporting hypothesis H3. Attitudes toward the police appears to be a significant mediator between minority status and willingness to coproduce.

Among other variables, we find that low income status is associated with more negative attitudes toward the police. Furthermore, attitudes toward the police mediates the relationship between low income status and willingness to report a crime. This also lends support to our hypotheses that lower SES citizens have more negative perceptions of the police as well as less willingness to coproduce. Meanwhile, the results for citizens living in medium-size urban areas is somewhat contrary to our hypothesis in that we expected respondents in larger cities to possess more negative attitudes toward the police and therefore, less likely to coproduce. One explanation is that police agencies in smaller cities might respond less effectively due to fewer personnel and resources to deal with crime incidents compared to that of larger cities (Paré, Felson, and Ouimet 2007). Due to such variations in service provision capacity, citizens might display more dissatisfaction and indicate less willingness to report crimes. However, it is difficult to further explore this this given data limitations.

Turning to the results on respondents who reported a non-crime emergency, there are fewer significant results compared to those who contacted the police for a crime, disturbance, or suspicious activity. We find that more frequent contacts with the police and being employed are rather associated with more positive attitudes toward the police, while low income is still a significant factor in predicting negative attitudes. However, none of these variables are significant in any of the effects that predict the willingness to contact police in the future. The difference in the results between model one and two suggests that even within the same category of

coproduction activities such as contacting the police, coproduction dynamics vary according to the type of information provided by citizens (crime emergency vs. non-crime emergency).

Overall, these findings hold potential for advancing coproduction theory. Prior studies have argued how socioeconomic factors may serve as barriers to more effective citizen coproduction, but we sought to look beyond generalizations and to investigate whether other important but unexplored factors located along the coproduction process may mediate the link between SES and motivations to coproduce. The literature on race relations assumes that minorities may be less willing to coproduce. However, the criminal justice literature suggests that a critical link, service users' attitudes toward the police shaped by direct experiences, may mediate this link. Through a structural equation modeling strategy, we explore how this factor might serve to mediate minority status and willingness to coproduce. Our empirical results found that race alone does not determine the willingness to coproduce, but that attitudes toward the police significantly mediate the relationship between race and willingness to coproduce. These results can contribute to empirical testing of coproduction frameworks and how different coproduction phases are linked together. Future researchers may consider exploring other latent dynamics in the process of who coproduces and why.

The results hold implications for practice across this and other police domains as well. They serve to emphasize the importance of government initiatives that can reduce barriers to citizen coproduction. They highlight the importance of public officials involved in service delivery to be aware of the perceptions of the citizens they serve, especially disadvantaged citizens, and to address barriers that may inhibit the participation of lower SES groups. They also suggest that public agencies must design coproduction processes to facilitate the meaningful participation of a variety of citizens, particularly disadvantaged groups (Bryson et al. 2013). The findings also point to the importance of evaluating the quality of service delivery and find ways to continuously

maintain and improve high standards. For law enforcement services, race relations have constituted a major restriction imposed on African Americans that lead to negative perceptions about the police and affect the willingness to coproduce. It is essential that law enforcement agencies acknowledge race as a major factor that impacts the way police officers interact with minorities, that influences the way minorities view the police in return, and subsequently, that can lead to the disruption of the process of coproducing public safety and security.

There are limitations that must be taken considered when placing the results in the proper context. First, it pertains to the variables used to measure attitudes and willingness to coproduce. The mediator variable *attitudes toward the police* and the dependent variable *willingness to contact the police in the future* are both based on respondents' most recent contact with the police, which is a single event. There is no data on whether respondents went on to contact the police afterwards. We include as an explanatory variable the number of police contacts that occurred in the past, but there is no information about the resulting attitudes for each of these individual contacts. If a prior contact with the police generated negative attitudes, but a respondent continued to coproduce despite that experience, then the willingness to coproduce may not accurately predict future behaviors.

Second, this study relies on data from one public service domain, law enforcement, and raises the question of whether the results are generalizable to other service realms. As with other public services, service user input is an inevitable element for coproducing public safety. However, unlike other service areas in which citizens may assert more discretion over whether to coproduce or not, the high risk nature of public safety issues prompts most citizens to have no choice but to contact the police in the event of a crime or emergency, regardless of their perceptions of the police. This may constitute one possible explanation for service users continuing to contact the police despite expressing negative attitudes and less inclination to coproduce. It becomes a critical policy

problem in the future not just when citizens begin to engage in less coproduction, but when such negative attitudes give rise to public complaints or lead to widescale protests against government.

This study has helped to provide a better understanding of what mediates the link between socioeconomic factors and willingness to coproduce. These results provide some limited but important evidence as to how different phases of the coproduction process are linked together. A legitimate concern for government service delivery is being responsive to citizens and making sure that everyone, especially disadvantaged groups, participate effectively in the production and delivery of public services. Further research in this policy domain as well as others should consider how citizen participation affects government and how it can enhance the practices of public management and policy and citizen engagement equally.

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Figure 1. A conceptual model of race and attitudes on willingness to coproduce

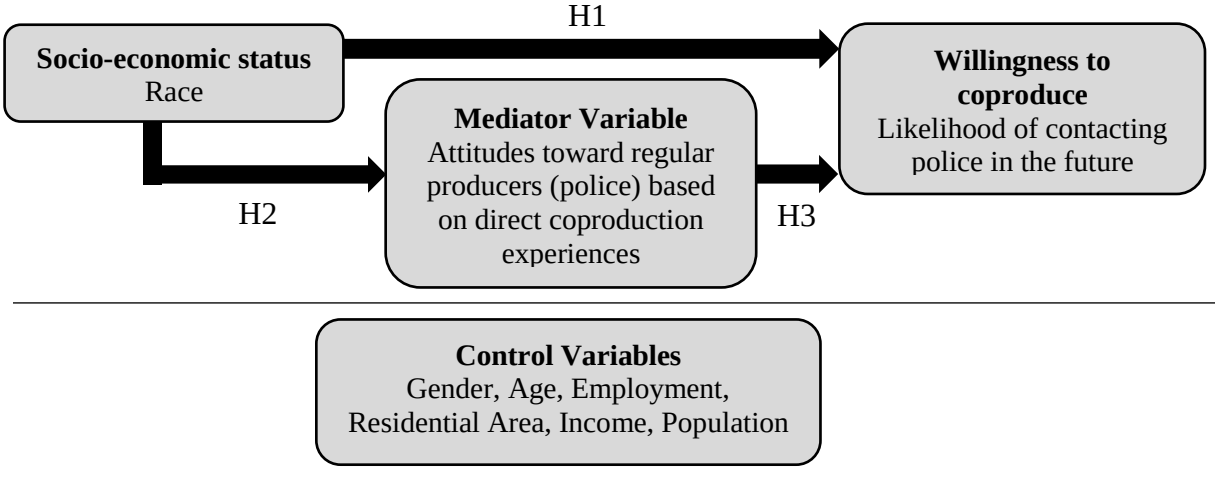

Figure 2. Likelihood of contacting the police in the future (PPCS 2015, *n* = 6432)

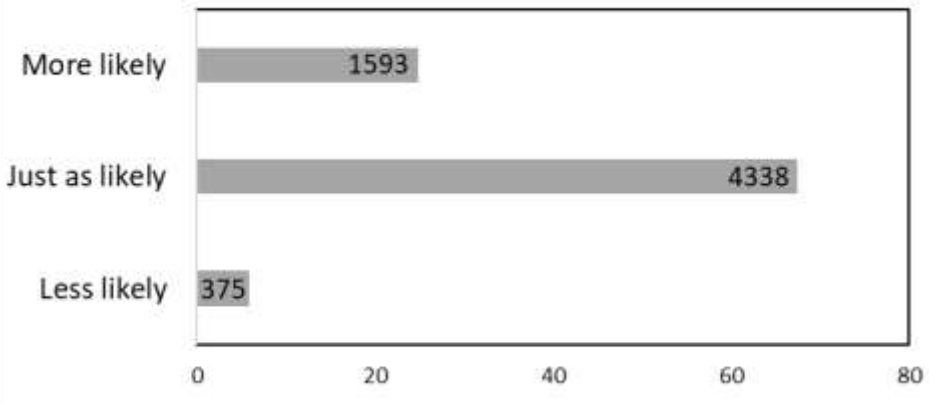

Figure 3. Racial composition of respondents who expressed their likelihood of contacting the police in the future (PPCS 2015, *n* = 6432)

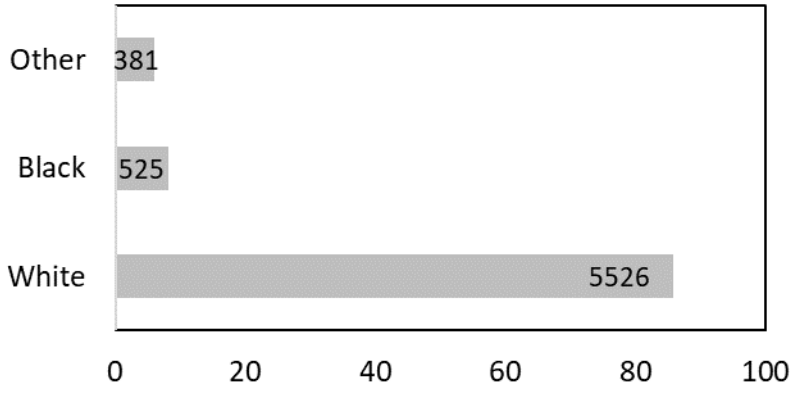

Table 1. Descriptive Statistics

Variables	Mean	Std. Dev.	Min	Max
Dependent Variable				
Likelihood of contacting police (crimes)	2.11	0.60	0	3
Likelihood of contacting police (noncrimes)	2.20	0.56	0	3
Mediation Variable				
Overall attitudes toward the police (factor analysis)	0.80	0.28	-0.32	1.17
Independent and Control Variables				
White citizen (1 = yes)	0.82	0.39	0	1
Black citizen (1 = yes)	0.11	0.31	0	1
Number of police contacts to report crime	1.46	1.51	0	15
Number of police contacts to report non-crime	1.42	1.79	0	20
Gender (1 = male)	0.47	0.50	0	1
Age (years)	48	18	16	90
Employment status (1 = employed)	0.58	0.49	0	1
Reside in Core-Based Statistical Area (CBSA) and principal area (1 = yes)	0.32	0.47	0	1
Reside in Core-Based Statistical Area (CBSA) but not in principal area (1 = yes)	0.53	0.50	0	1
Income				
Below $25,000 (1 = yes)	0.20	0.40	0	1
$25,000-$50,000 (1 = yes)	0.26	0.44	0	1
$50,000-$75,000 (1 = yes)	0.18	0.39	0	1
Population				
100,000 - 500,000 (1 = yes)	0.14	0.35	0	1
500,000 - 1 million (1 = yes)	0.05	0.23	0	1
1 million and above (1 = yes)	0.07	0.26	0	1

Table 2. Factor Loadings for the Latent Construct (Attitudes Toward the Police)

	Standardized Factor Loading
(1) *Prompt response* to request by police	0.542
(2) *Situation improved* after contact with the police	0.371
(3) *Satisfaction with police response* during the contact	0.718
(4) Police spent an *appropriate amount of time* with you	0.871
(5) Police *behaved properly* during contact	0.878
N	6,432

Note: Italic font denotes short form of the variable used in text.

Table 3. Direct Effects on Latent Variable *Attitudes Toward the Police*

Manifest Variables (report crime, disturbance, suspicious activity)	Unstandardized Coefficient	Standardized Coefficient
White citizen (1 = yes)	-0.014	-0.017
Black citizen (1 = yes)	0.077	0.073
Number of contacts	-0.012*	-0.079*
Interaction: Black citizen and number of contacts	-0.057**	-0.118**
Gender (1 = male)	0.004	0.006
Age (years)	0.001	0.020
Employment status (1 = employed)	0.016	0.025
CBSA and principal area (1 = yes)	-0.008	-0.013
CBSA but not in principal area (1 = yes)	-0.017	-0.027
Income below $25,000 (1 = yes)	-0.062*	-0.079*
Income between $25,000-$50,000 (1 = yes)	0.002	0.003
Income between $50,000-$75,000 (1 = yes)	-0.009	-0.011
Population 100,000 - 500,000 (1 = yes)	-0.084**	-0.100**
Population 500,000 - 1 million (1 = yes)	-0.064	-0.055
Population 1 million and above (1 = yes)	0.007	0.005

Table 4. Total, Direct, and Indirect Effects on Dependent Variable (Unstandardized Path Coefficients)

Variables (report crime, disturbance, suspicious activity)	Total Effect	Direct Effect	Indirect Effect
Dependent variable: Willingness to contact police in the future			
Latent variable			
Attitudes toward the police	0.422***	0.422***	no path
Interaction: Black citizen & attitudes toward police	-0.249	-0.249	no path
Manifest variables			
White citizen (1 = yes)	-0.074	-0.069	-0.006
Black citizen (1 = yes)	0.176	0.143	0.033
Number of contacts	0.004	0.009	-0.005
Interaction: Black citizen and number of contacts	-0.017	0.007	-0.024**
Gender (1 = male)	0.039	0.037	0.002
Age (years)	0.003**	0.003**	0.000
Employment status (1 = employed)	-0.001	-0.008	0.007
CBSA and principal area (1 = yes)	-0.010	-0.006	-0.004
CBSA but not in principal area (1 = yes)	0.159**	0.166***	-0.007
Income below $25,000 (1 = yes)	0.086	0.112	-0.026*
Income between $25,000-$50,000 (1 = yes)	0.010	0.009*	0.001
Income between $50,000-$75,000 (1 = yes)	0.011	0.015	-0.004
Population 100,000 - 500,000 (1 = yes)	0.052	0.088	-0.035**
Population 500,000 - 1 million (1 = yes)	-0.056	-0.029	-0.027
Population 1 million and above (1 = yes)	0.057	0.054	0.003

Note: *p < .05, **p < .01, ***p < .001

Figure 4. Structural Equation Model

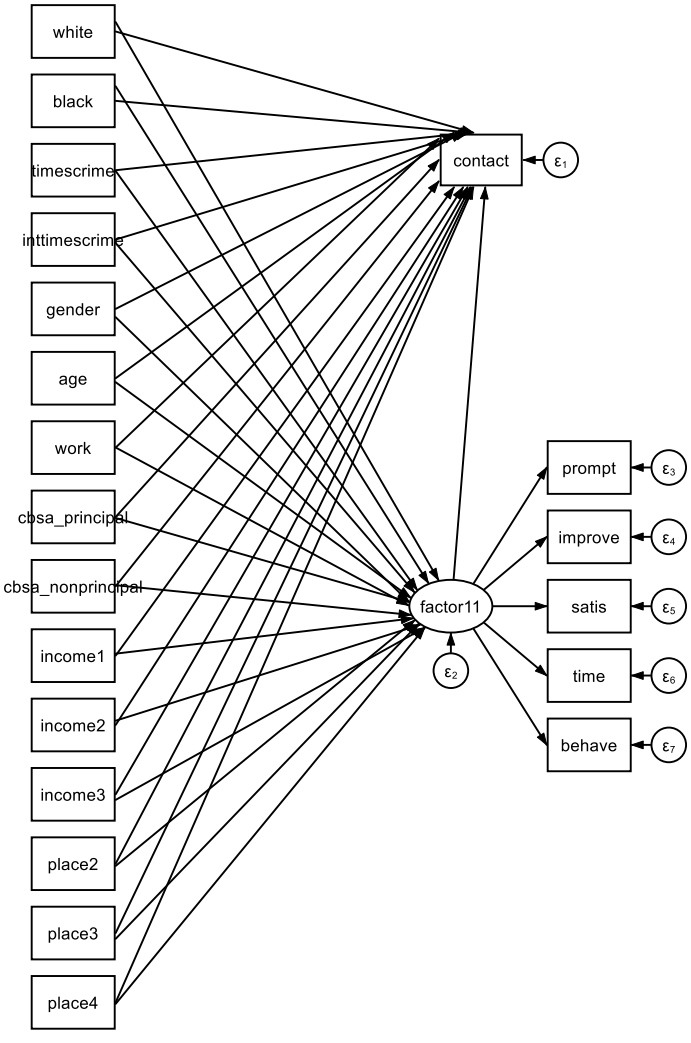

Table 5. Direct Effects on Latent Variable *Attitudes Toward the Police*

Manifest Variables (report non-crime emergency)	Unstandardized Coefficient	Standardized Coefficient
White citizen (1 = yes)	-0.041	-0.058
Black citizen (1 = yes)	-0.096	-0.103
Number of contacts	0.006**	0.053**
Interaction: Black citizen and number of contacts	0.002	0.007
Gender (1 = male)	-0.002	-0.003
Age (years)	0.001	0.049
Employment status (1 = employed)	0.046*	0.081*
CBSA and principal area (1 = yes)	0.005	0.010
CBSA but not in principal area (1 = yes)	0.015	0.030
Income below $25,000 (1 = yes)	-0.078**	-0.111**
Income between $25,000-$50,000 (1 = yes)	-0.016	-0.026
Income between $50,000-$75,000 (1 = yes)	-0.003	-0.004
Population 100,000 - 500,000 (1 = yes)	-0.034	-0.047
Population 500,000 - 1 million (1 = yes)	-0.047	-0.055
Population 1 million and above (1 = yes)	-0.100	-0.090

Table 6. Total, Direct, and Indirect Effects on Dependent Variable (Unstandardized Path Coefficients)

Variables (report non-crime emergency)	Total Effect	Direct Effect	Indirect Effect
Dependent variable: Willingness to contact police in the future			
Latent variable			
Attitudes toward the police	0.322**	0.322**	
Black citizen & attitudes toward police	0.199	0.199	
Manifest variables			
White citizen (1 = yes)	-0.093	-0.079	-0.013
Black citizen (1 = yes)	-0.010	0.021	-0.031
Number of contacts	-0.007	-0.009	0.002
Black citizen and number of contacts	-0.005	-0.005	0.001
Gender (1 = male)	0.012	0.013	0.000
Age (years)	0.000	0.000	0.000
Employment status (1 = employed)	-0.028	-0.043	0.015
CBSA and principal area (1 = yes)	-0.074	-0.076	0.002
CBSA but not in principal area (1 = yes)	-0.045	-0.050	0.005
Income below $25,000 (1 = yes)	-0.108	-0.083	-0.025
Income between $25,000-$50,000 (1 = yes)	0.119*	0.125*	-0.005
Income between $50,000-$75,000 (1 = yes)	0.102	0.103	-0.001
Population 100,000 - 500,000 (1 = yes)	0.018	0.029	-0.011
Population 500,000 - 1 million (1 = yes)	0.112	0.127	-0.015
Population 1 million and above (1 = yes)	0.229	0.261*	-0.032

Note: *p < .05, **p < .01, ***p < .001