

## ABSTRACT

Title of Dissertation: UNDERSTANDING THE PROCEDURAL  
JUSTICE IMPLICATIONS OF MACRO-  
LEVEL POLICE POLICIES: EVIDENCE  
FROM LONGITUDINAL POLICE AND  
JUVENILE OFFENDER DATA

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In response to a series of high profile conflicts between police and the communities they serve, President Obama's Task Force on 21<sup>st</sup> Century Policing recommended that law enforcement agencies adopt procedural justice as a guiding principle to inform their policies. While there is general agreement about the importance of procedural justice in shaping an individual's view of their encounters with police, it remains unclear how the many police policies that are already in place affect citizens' perceptions of police procedural justice. This dissertation seeks to understand how a common police policy—sending more officers to the areas with the most crime—impacts perceptions of procedural justice, so that policies formed with the goal of enhancing perceptions of procedural justice might be better informed.

This study exploits quasi-experimental conditions that resulted from the selective implementation of the Philadelphia Police Department's 2008 Crime Fighting

Strategy (CFS) in only nine of their twenty-three police districts. In doing so, the effect of sending more police officers to high crime areas on perceptions of police procedural justice can be estimated. While many have sought to estimate the impact of more police on offending and delinquency externalities, this particular question has not yet been researched. Further, this research focuses specifically on the perceptions of serious adolescent offenders; this is critical, as offenders were ostensibly the intended target of the CFS, many of whom experience frequent and high stakes interactions with police.

Findings indicate that serious adolescent offenders' perceptions of procedural justice based on personal experiences do not operate in tandem with perceptions based on vicarious experiences, with the two measures displaying opposite signs when correlations with district level crime and socio-economic factors were estimated. The CFS did not appear to influence significant changes in adolescents' perceptions of procedural justice when the treatment and control districts were compared, or when within-individual changes were estimated. Further, perceptions did not necessarily update as a function of moving from one district to another, as many of the individuals who remained in a single district also updated their perceptions.

Implications and limitations of these findings are discussed.

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MACRO-LEVEL POLICE POLICIES: EVIDENCE FROM LONGITUDINAL  
POLICE AND JUVENILE OFFENDER DATA

by

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## Chapter 1: Introduction

The United States is experiencing a revived interest in police procedural justice and legitimacy. This follows a series of highly publicized, fatal interactions between police and citizens, and the public's confidence in the police falling to its lowest levels in over two decades (Jones 2015).<sup>1</sup> In response to these high profile incidents and escalating conflicts between police and the communities they serve, President Barack Obama signed an executive order establishing the Task Force on 21<sup>st</sup> Century Policing on December 18, 2014. The Task Force was created to identify best policing practices and offer ideas on how to reduce crime while building public trust. The group's final report was issued in May 2015 and included six pillars of recommendations on how policing practices can successfully promote crime reduction while building public trust. The first of these pillars "Building Trust and Legitimacy" advised:

Law enforcement culture should embrace a guardian—rather than a warrior—mindset to build trust and legitimacy both within agencies and with the public. Toward that end, law enforcement agencies should adopt procedural justice as the guiding principle for internal and external policies and practices to guide their interactions with rank and file officers and with the citizens they serve. Law enforcement

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<sup>1</sup> In 2015, 25 percent of Americans said they had a "great deal" of confidence in police, 27 percent had "quite a lot", 30 percent had "some" 16 percent had "very little", and 2 percent had "none". The total 18 percent who had very little or no confidence in police was the highest measured by this poll since it began in 1993 (Jones 2015). Recent national polls have revealed that not only are nonwhites less confident in the police's ability to protect them from violent crime than whites, but between 2013 and 2014 the percent of nonwhites who rated the honesty and ethical standards of police officers as "very high" or "high" dropped by twenty-two points; this lack of confidence in police is particularly strong among non-Hispanic blacks living in urban areas (Jones 2014a; Jones 2014b; McCarthy, 2014).

agencies should also establish a culture of transparency and accountability to build public trust and legitimacy (2015: 1).

Overall, this pillar advocates for departments to embrace procedurally just policing with the goal of enhancing the quality of citizen interactions and overall perceptions of police legitimacy.<sup>2</sup>

Policing based on procedural justice (i.e. when officials use their authority in a fair and just way) generally instructs officers to exercise their authority with a high quality of treatment and high quality of decision-making processes (Mazerolle et al. 2013; Reisig et al. 2007).<sup>3</sup> How experiences with police are perceived is important, as they can be indicative of more than just citizen satisfaction. Numerous studies have found procedural justice to matter more than outcome favorability, distributive justice, and police effectiveness in determining how someone evaluates an interaction with police—particularly with regard to overall legitimacy (Engel 2005; Reisig et al. 2007; Tyler 1990, 2005; Tyler and Huo 2002).

The President’s Task Force’s prescription for procedural justice and legitimacy driven policing is consistent with existing research (Hinds and Murphy 2007; Tyler 2001, 2004); when police officers engage in procedural justice-oriented behavior, citizens are generally more satisfied with the outcomes and their perceptions of legitimacy are measurably higher (Mastrofski et al. 1996; McCluskey

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<sup>2</sup> In the present context, legitimacy refers to “the belief that the police are entitled to call upon the public to follow the law and help combat crime and that members of the public have an obligation to engage in cooperative behaviors” (Tyler 2004:86).

<sup>3</sup> This consists of officer behaviors such as: allowing citizens to participate in the decision process (i.e. giving them a voice), acting with neutrality, treating individuals with dignity and respect, and demonstrating genuine and trustworthy motives (Tyler 1990, 2004).

2003; Reiss 1971; Tyler and Fagan 2008; Wells 2007). Subsequently, when individuals perceive police as legitimate, outcomes such as compliance with the law, cooperation with the police, and willingness to support policies that empower the police are more likely (Bradford et al. 2009; Sunshine and Tyler 2002; Tyler and Fagan 2008).<sup>4</sup> It would thus follow that by adhering to Pillar One of the President's Task Force's recommendations, not only could relationships between police and communities be improved, but crime rates and case closures could also benefit.

However, there is still much that we do not know about how many of the crime control strategies already utilized by police affect perceptions of procedural justice in the communities they serve. For example, the act of sending more officers and resources to high crime areas is ubiquitous, but has only been studied from a deterrence perspective—assessing crimes reduced as a function of perceived risk.<sup>5</sup> Before moving forward with the Task Force's recommendation to implement procedural justice oriented policies, it would be helpful to take an inventory of how policies already in place are related to this end. This dissertation capitalizes on a recent initiative by the Philadelphia Police Department and a collection of panel and administrative datasets, to attempt to evaluate the effect that targeted policing strategies have on serious adolescent offenders' perceptions of police procedural justice. By understanding how this common police strategy impacts these perceptions,

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<sup>4</sup> These relationships applied to both white and minority group individuals (Sunshine and Tyler 2003).

<sup>5</sup> This widespread use of this approach—increasing the number of officers in an effort to address crime—was most pronounced in the Violent Crime Control and Law Enforcement Act of 1994, which among other things, established the Community Oriented Policing Services (COPS) Office, and authorized it to fund the hire of 100,000 additional police officers nationwide.

we can make more thoughtful decisions about how to improve perceptions of procedural justice going forward.

The policy assessed in this dissertation was implemented in January 2008 by Philadelphia Police Commissioner Charles Ramsey, in an effort to address persistent violent crime. This multifaceted strategy prioritized nine Philadelphia police districts that were identified as being the most violent in the city, based on an analysis of 2007 homicides, shootings, robberies, and aggravated assaults (*Crime Fighting Strategy* 2008). These high crime areas were provided with additional resources and an enhanced police presence. Specifically, these nine districts were slated to receive 200 additional officers on the street by May 1, 2008, through the use of overtime to extend tours, deploying graduating recruits to the nine districts, and reallocating other department resources.<sup>6</sup> Importantly, this initiative did not instruct officers on what to do when in these districts, and did not cause measurable changes in the other fourteen districts not identified as targets.

The selective implementation of this initiative in high crime areas, while the remainder of districts was relatively unchanged, provides a unique opportunity to assess the impact of a targeted policing strategy on perceptions of procedural justice. Does the enhanced police presence affect local residents' perceptions of the police? What if these residents are serious offenders? Criminological theory suggests that it is not the number of police that should influence these perceptions, but rather the quality of their interpersonal exchanges with the public (e.g. Tyler 1990). However, any

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<sup>6</sup> The geographic unit referred to in this dissertation as a police "district" is no different than a police "precinct". The word district is used here for the purpose of consistency with the Philadelphia Police Department's own terminology.

notion that the number or concentration of officers does not matter has not been formally tested.

There are reasons to believe that the number of police may in fact influence how individuals—particularly serious adolescent offenders—perceive the police. For instance, enhancing the police presence in a particular area provides more opportunities for individuals to witness police-community interactions.<sup>7</sup> In doing so, they can update their perceptions based on the quality of treatment they witness, and can also compare their own treatment by the police to how they see the police treating others. This latter point is crucial, as perceived fairness and equity in treatment are central to evaluating the police as procedurally just (Tyler 1990). Further, updating perceptions can be influenced by cognitive biases such as the “negativity bias”, or trend of prior perceptions influencing successive attitudes (Augustyn 2016; Baumeister et al. 2001; Rosin and Royman 2001); thus, as adolescent offenders, who are likely to have relatively low perceptions of the police, acquire new experiences with the police, it is less likely they will update their perceptions in a positive direction.

Additionally, labeling an area as “high crime” or a target for police activity, as was done in the Philadelphia Crime Fighting Strategy, can potentially have negative consequences on its residents. There is an ongoing debate about how labeling areas as “high crime” or “hotspots” may actually increase perceived fear of crime (Pate et al. 1986; Weisburd et al. 2011), which is associated with lower perceptions of police

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<sup>7</sup> The importance of vicarious experiences to updating perceptions of procedural justice is described in detail in Chapter 2.

procedural justice. Prior research has found satisfaction with police is generally lower in neighborhoods with higher crime rates, and greater fear of crime, after controlling for race (Reisig and Parks 2000; Sampson and Bartusch 1998). Thus, it is possible that there is a tradeoff between a higher police presence and perceptions of procedural justice. Additionally, there is evidence to suggest that an enhanced government response to crime or violence may embolden those who already participate in crime, and potentially encourage others to join (LaFree et al. 2009).

### Statement of the Problem

Despite the intuitive nature of the Philadelphia Police Department's Crime Fighting Strategy, the impact of more officers on crime rates remains a subject of debate, and the impact of more officers on citizen perceptions of procedural justice and legitimacy is yet untested (e.g. Chamlin and Langworthy 1996; Eck and Maguire 2000; Levitt 2004; Marvell and Moody 1996; Niskanen 1994). This gap in the literature warrants investigation due to the common application of policies similar to the one used in nine of Philadelphia's police districts, the recommendations of the President's Task Force, and evidence to suggest that we do not understand these perceptual measures at a macro-level.

There is cause to believe that enhanced strength of a police force might be related to perceptions of procedural justice or legitimacy, as the likelihood of interacting with police is higher when there are more officers on the streets; there are more opportunities to witness police-citizen interactions, and compare them with one's own treatment; and being labeled as a "target", or enhancing the police presence might have a backfire effect by increasing resident's fear of crime, and/or

emboldening criminals in the area. While more police could potentially drive down the crime rate, research only loosely supports an instrumental relationship between police effectiveness and perceptions of legitimacy (Sunshine and Tyler 2003). In sum, it is plausible that policy changes such as Philadelphia's addition of more officers to high crime areas have procedural justice and legitimacy implications; however these outcomes are largely unknown and understudied.

Thus, while it would be inappropriate to classify the President's Task Force's recommendation to adopt procedural justice guided policing as premature, it is important to acknowledge that we do not fully understand how current, commonplace police strategies impact perceptions of procedural justice, or if there are certain aspects of current policies that can be exploited to achieve the Task Force's goals. By studying the conditions created by Philadelphia's policy change, we might improve our knowledge of perceptions of police procedural justice, understand how police force strength affects perceptions, and whether these perceptions are influenced by one's environment, and understand how these factors might be exploited to improve perceptions of police procedural justice in the future.

Both academic research and national polls have found that perceptions of procedural justice are not evenly distributed across the population, and may instead vary according to racial, ethnic, and even political groups (Jones 2015; Sunshine and Tyler 2003; Tyler 2005).<sup>8</sup> Further, there is evidence to suggest that attitudes towards

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<sup>8</sup> This finding regarding public trust in police as an institution is not to be confused with the debated notion that perceptions of what comprises procedurally just behavior, and the socio-psychological benefits of procedural justice are invariant across individuals and cultures (e.g. Tyler 1990; Tyler and Huo 2002).



the police may vary according to geography (Dunham and Alpert 1988; Reisig and Parks 2000; Sampson and Bartusch 1998; Wu et al. 2009). However, this variation in perceptions is not fully understood at the local level, or in the context of a discrete policy change; instead there is a substantial disjoint between our understanding of perceptions of police at the individual level and the larger scale at which police services are delivered. This gap exists at many levels of the criminal justice system; for example with regard to deterrence, the accuracy of individuals' perceived risk of arrest, relative to the actual risk of arrest (macro-level) is not well understood (Kleck et al. 2005). Similarly, without fully understanding how macro-level policies affect individuals' beliefs or perceptions regarding justice, it is difficult to ascertain the full impact of these reforms. While scholars have identified mechanisms through which individual perceptions of procedural justice influence views regarding legitimacy (e.g. Tyler and Huo 2002), the field lacks a comprehensive understanding of how major police policies such as sending more officers to high crime districts are associated with these views; in particular it is unclear what effect changing strategies or tactics that are not implemented with the goal of affecting procedural justice outcomes might have on these perceptual measures.

### *Goals of the Current Research*

The current state of the literature on the implications of macro-level police policies—such as the Philadelphia Crime Fighting Strategy—on perceptions of procedural justice is generally undeveloped and requires study, so that real progress between police and the communities they serve might occur. This dissertation seeks to address this gap in the research. By treating the adoption of the Crime Fighting

Strategy as a “natural quasi-experiment”, this dissertation avoids the shortcomings of prior studies that have sought to identify externalities of adding more police to a jurisdiction. As such, this research not only tackles a timely yet unstudied question, but does so in a rigorous way.

This study also offers the novel contribution of joining longitudinal panel data that include serious adolescent offenders’ perceptions, with police, crime, and U.S. Census data, all coded at the police district level. This massive undertaking required cooperative agreements from both the Philadelphia Police Department and the Pathways to Desistance research group, and consistent geocoding schemes across all four datasets, and across ten waves of panel data. By merging longitudinal offender data with official crime statistics, personnel information, and population demographics, this amalgamated dataset can inform research questions across a number of levels, and importantly, bridge the gap between our understanding of macro-level influences and individual level perceptions.

This research looks specifically at serious adolescent offenders’ perceptions of police procedural justice, as these individuals are likely to have the most frequent and highest stakes interactions with police officers.<sup>9</sup> In other words, learning how to effectively target the most active offenders with procedural justice-guided policies should pay dividends both in improving police-community relations, and compliance with the law. By uniting the adolescents’ perceptions with multiple sources of official

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<sup>9</sup> Unlike the adolescent offenders included in this study, most people have little to no contact with police; in 1999 only 21 percent of U.S. residents had contact with police, and only one percent of these contacts involved police force (Langan et al. 2001). By 2008 this contact was reduced to 17 percent of the population, with one percent experiencing some force (Eith and Durose 2011). Instead most of the general publics’ perceptions are formed through secondary means—media, family, friends, and other social networks (Rosenbaum et al. 2005).

data, the overarching aim of this dissertation—to better understand procedural justice implications of a common police policy—may be achieved.

The first goal of this dissertation is to determine if there is measurable variance in how residents of Philadelphia police districts perceive law enforcement. Previous research has shown there to be variability in indicators of police legitimacy generated from official data (i.e. police responsiveness to crime and police misconduct events) between precincts with low, high, and extreme disadvantage (Kane 2005). However, this has yet to be established with longitudinal perceptual measures, or using data exclusively from serious adolescent offenders. To better understand the distribution of these perceptions across the city and lay the foundation for subsequent longitudinal analyses, this dissertation will answer the following question:

RQ1: Do serious adolescent offenders' perceptions of procedural justice vary across police districts?

- 1a. Is there a relationship between the relative strength of the police force and district level perceptions of police procedural justice?
- 1b. Are social, demographic, or economic conditions associated with adolescents' perceptions of procedural justice?

After exploring the nature of procedural justice, police concentration, and other relevant factors across the geopolitical landscape of Philadelphia police districts, this dissertation will assess the impact of the Crime Fighting Strategy policy that targeted nine of these districts, estimating the causal effects the policy may have had on perceptions of procedural justice.

RQ2: Does a change in local policy or police resources impact perceptions of police procedural justice?

First, the broad impact of the policy will be assessed by comparing perceptions in the nine targeted districts, to the fourteen other districts before and after the Crime Fighting Strategy was imposed. This will broadly answer the question:

2a. Does the influx of additional officers affect perceptions of procedural justice between individuals in target and control districts?

Next, a more nuanced analysis will attempt to estimate within-person change in relation to the policy. This will attempt to determine whether the adolescent offenders' perceptions of procedural justice changed as a function of the Crime Fighting Strategy.

2b. Are individual level perceptions affected by district level police staffing changes?

This dissertation is also interested in better understanding the role of geographic and temporal context on individuals' perceptions. Specifically, the third portion of the analysis seeks to investigate whether perceptions change alongside neighborhood conditions. This is important, because if individuals do not update their beliefs as their surroundings or experiences change, then it would suggest a different type of policy to improve police-community relationships than if they were continuously updating. Thus, this dissertation will also address the following within individual questions:

RQ3: Do perceptions of police procedural justice change as individuals relocate across police districts?

3a. Are individual perceptions regarding police stable across time and place?

Moreover, this question also seeks to understand the degree of change in perceptions for individuals who move to a new police district relative to those who did not move.

3b. Do movers' perceptions change more than the perceptions of individuals who did not move?

By addressing these three research questions, this dissertation should contribute to the extant literature by identifying how contextual and policy-related conditions are associated with perceptions of police procedural justice at the macro-level (between districts) and individual level (within persons). Furthermore, by focusing specifically on serious adolescent offenders, these analyses will place the attention on the individuals most likely to come into contact with police, and thus most likely to be directly affected by staffing changes. As such, this study is unique in its ability to enhance our understanding of policing and procedural justice as perceived by the highest risk population.

### Overview of Dissertation

Much of the research on perceptions of police policy changes, procedural justice, and legitimacy is based on individual level surveys of the general population. This work adds to the growing body of literature on police legitimacy by using innovative methods to assess the relationship between law enforcement resources and serious juvenile offenders' perceptions of procedural justice.

In Chapter 2 of this dissertation I describe the Philadelphia Crime Fighting Strategy in greater detail, and then review the literature on perceptions of police

procedural justice, estimating the effects of police deployments in high crime areas, and current issues in measuring perceptions of police. The first part of this chapter provides a description of the Strategy, and estimates of its initial impact on staffing and crime outcomes. Key aspects of the outcome of interest—police procedural justice—are then introduced and defined, and prior research exploring perceptions of procedural justice based on the personal and vicarious experiences of offenders and the general public are summarized. Finally, issues in estimating the causal impact of adding more police officers to high crime areas, and measuring citizen perceptions are outlined.

Chapter 3 of this dissertation describes the data utilized. This chapter introduces the separate administrative, crime, demographic, and panel data sources that were merged to create a large, multilevel dataset. The panel data come from the Pathways to Desistance Study, which captures the objective and perceptual measures of a sample of serious adolescent offenders who have been adjudicated from juvenile or adult court systems. Unique to this dissertation, these longitudinal data were coded to identify the police district in which the adolescent offender resided during each interview wave. These data were then paired with longitudinal crime and police force data provided by the Philadelphia Police Department for the precise months that the Pathways data were collected, as well as data from the U.S. Census.

Chapter 4 outlines the analytic plan for answering the research questions presented in Chapter 1. The different methods utilized are described for each question and sub-question, and justifications for using particular techniques are provided when appropriate. Chapters 5, 6, and 7 present the results from the three research questions,

respectively. Finally, Chapter 8 discusses the findings of this research, the implications, limitations, and directions for future inquiry.

## Chapter 2: Literature Review

This chapter provides context for the present study of police procedural justice in Philadelphia. This literature review will provide background information on the Philadelphia Police Department's Crime Fighting Strategy, which is being evaluated here. Next, prior research on the concept of police procedural justice is described; this section includes studies conducted at the individual, and macro levels, with the latter often taking the form of neighborhoods or social groups. Finally, literature and issues related to estimating the causal impact of police manpower, and measuring perceptions of procedural justice are discussed. By reviewing these literatures, context for the present study and expectations regarding outcomes should be clarified.

### *The Philadelphia Police Department Crime Fighting Strategy*

On January 7, 2008, Philadelphia Mayor Michael Nutter signed an executive order declaring a crime emergency and directing the Commissioner of Police, Charles Ramsey to submit a strategy for combatting violence by January 30.<sup>10</sup> The *Crime Fighting Strategy* document that was ultimately produced by Commissioner Ramsey and his command staff described new organizational values and guiding principles that could make the Department more effective in preventing crime (see Appendix A for the full document). Further, the Department issued the goals of reducing homicides by twenty-five percent, the number of shooting victims by twenty percent,

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<sup>10</sup> Both Mayor Nutter and Commissioner Ramsey were sworn into their respective positions with the Philadelphia government on January 7, 2008.



UCR Part I violent crimes by twenty percent, and increasing the homicide clearance rate to sixty-five percent among other goals, all in the first year.

To address these goals, the central policy recommendation in the *Crime Fighting Strategy* document required identifying and intervening in the nine most violent of the twenty-three total police districts. These nine “target districts” were identified based on an analysis of 2007 homicides, shootings, robberies, and aggravated assaults. Together, the target districts accounted for 65 percent of the homicides, 64 percent of the shooting victims, 55 percent of the robbery victims, and 59 percent of the aggravated assaults (Nutter and Ramsey 2011:12). A staffing analysis identified that six of the nine districts required additional personnel (the 18<sup>th</sup>, 19<sup>th</sup>, 14<sup>th</sup>, 35<sup>th</sup>, 39<sup>th</sup>, and 15<sup>th</sup>); the 22<sup>nd</sup>, 25<sup>th</sup>, and 12<sup>th</sup> Districts, which were also among the nine most violent, had received staffing increases in 2007. As such the Commissioner vowed to assign 200 additional officers to the target areas that had not recently received more staff by May 1, 2008. The department planned to increase deployments to the target districts by: using overtime to extend tour of duties to cover high crime times and areas; detailing members of some specialized teams among the target districts; assigning the majority of graduating recruits to target districts; redeploying ten percent of administrative staff to patrol; maintaining at least sixty percent of sworn personnel in uniform patrol; and establishing a Summer Mobile Force Unit.<sup>11</sup> Additionally, the targeted districts were to hold crime briefings three times per week until crime reduction goals were achieved, and it was proposed that

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<sup>11</sup> The Summer Mobile Force Unit was scheduled to be implemented May 1, 2008, and be composed of off-duty uniformed officers working overtime, and deployed in the nine target districts. This would provide an additional seventy officers from Thursday evening through Sunday morning, and run through the month of September.

the city's Juvenile Enforcement Teams (JET) would be expanded to cover the nine districts.<sup>12</sup>

In addition to the work with target districts, the *Crime Fighting Strategy* document outlined city-wide strategies that included nineteen "intelligent policing strategies", twelve "collaboration strategies", five "prevention strategies", eight "continuous improvement strategies", and reviewed the city's use of deadly force policy. The fourteen districts not identified as targets could allot overtime to extend tours of duty as necessary; received recruits to ensure minimum staffing levels; maintained sixty percent of all sworn staff on uniform patrol; and could request to have officers redeployed from specialized units and administrative staff to support existing patrol operations.<sup>13</sup> Additionally, all districts were to implement Police Athletic Leagues (PAL) by summer 2008 in an effort to provide positive activities for local children.

Improving perceptions of police procedural justice and legitimacy was not explicitly among the goals outlined in the document. However, the Department did recommend implementing a community satisfaction and security survey, as well as specialized interpersonal communication and leadership training for front line

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<sup>12</sup> JET teams involve a partnership between the Philadelphia Police Department and the Juvenile Probation Department. This program involves conducting compliance checks at the homes of high-risk juveniles and those engaged in violent behavior, to serve juvenile warrants, and provide a highly visible presence in areas where juvenile violence is known to occur (Philadelphia Police Department, 2011).

<sup>13</sup> Specialized units that were dissolved in order for officers to be redeployed included the 92<sup>nd</sup> District, the SITE (Strategic Intervention Tactical Enforcement) Unit, Background Investigations, and IMPACT (Integrity Management Police Anti-Corruption) Unit. The IMPACT responsibilities were moved to a recently expanded Integrity Control Office in the Internal Affairs Division.

supervisors and officers. These were components of the “continuous improvement strategies”, and applied to the entire city, rather than just the nine target districts.

In 2011 the Philadelphia Police Department issued a three year progress report on the Crime Fighting Strategy. In the three years after the Strategy’s inception staffing increased by nearly thirteen percent in the nine targeted districts, while total department staffing decreased by 1.5 percent due to attrition and a hiring freeze. Between 2008 and 2010 staffing in the targeted areas was increased by adding new officers, combining districts, and abolishing specialized units in order to reassign officers to patrol. Other adjustments were made in order to maximize the number of uniform patrol personnel available during peak crime periods, such as creating a new shift from eight o’clock p.m. to four o’clock a.m. in certain districts, and redeploying personnel from specialized units that had not been dissolved to patrol during spring and summer months.

In 2009, three more districts were added to the list of targeted high crime areas: the 16<sup>th</sup>, 17<sup>th</sup>, and 24<sup>th</sup> districts. Commanders from the targeted districts participated in weekly crime briefings at police headquarters to discuss recent crimes, tactics, statistics, and case updates.<sup>14</sup> It is not clear from the follow up report, however, if the expansion of JET teams to the nine target districts took place within

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<sup>14</sup> In the 2011 progress report juvenile arrests and victimizations were also reported, though not specifically with regard to presence in a targeted or non-targeted district. Overall between 2007 and 2010, juvenile arrests for Part I crimes dropped by nineteen percent and for Part II crimes by twenty-eight percent. During this time, all arrests went up by 2.8 percent while juvenile arrests went down by twenty-five percent. Between 2007 and 2010 juvenile crime victimizations also decreased; Part I crime victimizations dropped by twenty-one percent, while Part II crime victimizations dropped by seventeen percent (the overall drop was eighteen percent).

the first few years of the Crime Fighting Strategy.<sup>15</sup> Aside from descriptive comparisons provided in the three year progress report, the 2008 Crime Fighting Strategy has not been evaluated. The analytical scenario created by labeling some areas as “target districts” and leaving the remainder relatively unchanged has yet to be exploited, and potential causal effects have not been estimated for outcomes such as crime rates or perceptions of police procedural justice.

### *Procedurally Just Policing*

As stated earlier, police procedural justice is a central issue in current discussions of criminal justice reform, and was identified as an area for improvement in the President’s Task Force’s Report on 21<sup>st</sup> Century Policing. A significant obstacle in the movement to improve societal perceptions of police procedural justice is that the concept of procedural justice was developed at the individual level. While contemporary applications of procedural justice are largely criminal justice-related, the concept originated in social psychology with Adams’ (1965) equity theory.<sup>16</sup> According to this theory, when an interpersonal exchange occurs between the two parties and the proportion of profits relative to investments fall out of balance, the party experiencing the relative deprivation in profits per investments is likely to perceive an injustice (Adams 1965; Homans 1961).<sup>17</sup> Importantly, many of the

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<sup>15</sup> In addition to limited mention in the follow up report, there is also no mention of JET officers in the Department’s internal manpower data, broken out by officer rank, assignment, month, and year (see Chapter 3 for detailed description of the data).

<sup>16</sup> Adams’ equity theory utilizes Homans’ (1961) definition of distributive justice in an exchange relationship: that if costs to one person are higher than another, the rewards should be higher as well. Adams (1965) equity theory depicted this definition as a dyad based on the idea of proportionality; the difference in rewards and costs of an exchange, divided by their investments, should be equal across both parties for the relationship to be considered equitable.

<sup>17</sup> Perceived inequity may produce several potential consequences, such as: altering one’s inputs (e.g. increasing one’s productivity), altering one’s outcomes, distorting one’s inputs and outputs cognitively,

inequities perceived in the criminal justice system and interactions with authorities are seen as based on inputs that cannot be altered (e.g. race, age, gender; Engel 2005).

Rather than focus on the relative fairness and equity of decisions, the contemporary procedural justice model applied to criminal justice assesses the *process* through which decisions are made by authorities. This process-oriented model is also distinct from “outcome” or “instrumental” assessments of police behavior, in which evaluations are based on the police’s ability to catch law violators and fight crime (Sunshine and Tyler 2003). Instead, procedurally just criminal justice processes are tied to perceptions of procedural fairness. This was demonstrated in a study of perceptions of fairness in American and European courts that found litigants were more satisfied when they had the ability to voice their opinion and exert some control by stating their case to a non-biased third party decision maker; these individuals were more satisfied even if the trial outcome was not favorable (Thibaut and Walker 1975, 1978). Overall, opinions of procedural justice in criminal justice processes are influenced by perceptions that authority figures: are unbiased and do not have a vested interest in the outcome beyond what is best for society; make consistent decisions across individuals and over time; apply accurate information; correct bad decisions; and conform to moral and ethical norms (Leventhal 1980; Leventhal et al. 1980).

Perceiving the criminal justice system as behaving in a procedurally just way is an established antecedent to believing it to be legitimate (Tyler 1990; Tyler and

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or acting on the other person (Adams 1965). When one’s expectations concerning outcomes—as determined by a normative rule—are congruent with actual outcomes, distributive justice is thought to exist (Clay-Warner et al. 2005).

Degoey 1996). This relationship is important, as legitimacy drives the belief that not only is the system “appropriate, proper, and just” (Tyler 2006: 375), but also that people should defer to and obey its authority (Sunshine and Tyler 2003; Weber 1978).

<sup>18</sup> As such, enhancing perceptions of procedural justice on a large scale has the potential to yield significant dividends for public safety. That said, how to enhance perceptions of procedural justice at the community level is much less clear.

#### Procedural Justice and Policing

Procedural justice-based policing relies on four central assumptions:

1. When people view legal authority as legitimate they voluntarily follow the law.
2. Legitimacy is more important than instrumental judgments (e.g. assessment of police performance) in predicting whether people will cooperate with the police.
3. Legitimacy is more important than instrumental judgments in shaping public deference to police activities; when seen as legitimate, people are more likely to empower than try to circumscribe police duties.
4. Evaluations of legitimacy are based on procedural fairness more so than on judgments about distributive fairness or other instrumental indicators (Sunshine and Tyler 2003:523).

As with the criminal justice system more broadly, the relationship between police procedural justice and perceptions of legitimacy has been demonstrated in a number of studies using both cross-sectional and panel data (e.g. Elliot et al. 2012; Lind and Tyler 1988; Tyler 1989, 1990, 2001). This body of research has demonstrated that how police treated people explained more of the variance in police evaluations than the quality of police performance, even in high crime areas (Tyler and Huo 2002).

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<sup>18</sup> The sense that individuals ought to obey authorities is distinct from obeying authorities for the purpose of self-interest. Instead, perceptions of legitimacy result in self-regulatory behavior because one feels that authorities and their directives ought to be obeyed (Tyler and Blader 2003: xiv).

Additionally, when police exhibited procedural justice (e.g. through quality decision making, quality of treatment, and projecting trustworthiness) the citizens they encountered were less likely to feel as though they had been profiled (Tyler and Wakslak 2004). Shifting from a policing style focused on command-and-control to a more “procedurally just” approach of interacting with citizens can thus improve assessments of police legitimacy and favorability (Sunshine and Tyler 2003; Tyler and Huo 2002).

It follows that perceived procedural justice also affects deference to legal authorities, compliance with police directives and the law, and assisting police in crime control by reporting crime and supplying information about criminal activity (Decker 1985; National Academy of Science 2004; Sunshine and Tyler 2003; Tyler 2003, 2006). However, this effect does not strictly operate through procedural justice’s influence on legitimacy; perceptions of procedural justice have been shown to independently affect cooperation with the law and police (e.g. Paternoster et al. 1997; Penner et al. 2014; Tyler and Huo 2002).

There is evidence to suggest that perceptions of police procedural justice are not stable over time. Much like perceptions of sanction risk update as new experiences and information are acquired (e.g. Anwar and Loughran 2012; Minor and Harry 1982; Paternoster et al. 1985; Pogarsky et al. 2004), perceptions of procedural justice and legitimacy are similarly malleable. Updating can occur as part of ones’ legal socialization, in which individuals acquire attitudes and beliefs about the law, legal authorities, and legal institutions through both personal and vicarious

interactions with police, courts, and other legal actors (Piquero et al. 2005: 267).<sup>19</sup> Direct personal experience with law enforcement officials provides the most direct socialization, with regard to changing perceptions of police procedural justice (Tyler et al. 2014:4017), and one's most recent interaction with the police was found to be the strongest predictor of attitudes toward the police (Gau 2010; Tyler 1990; Tyler and Huo 2002). In addition to the quality of the interaction with police, how one updates their perception of police procedural justice is largely related to their role in the exchange with law enforcement personnel.

#### Offender Perceptions of Procedural Justice

Perhaps not surprisingly, those who initiate contact with the police generally view the police more favorably than those who are subjected to involuntary encounters (Bordua and Tift 1971; Cheurprakobkit 2000; Decker 1981).<sup>20</sup> In other words, those who call the police to report crime typically have more positive opinions of the police than those suspected of committing the crime. This disparity suggests that much of the prior procedural justice research, conducted largely using samples of the general public or traffic law violators may be limited in what it can tell us about serious or chronic offenders' perceptions. Recent studies have made concerted efforts to focus specifically on offending populations and to understand how one's status (average citizen or serious offender) interacts with different procedural justice

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<sup>19</sup> Despite the ability to change and respond to new experiences, Piquero and colleagues (2005) demonstrated that there is strong stability in perceptions of legitimacy and legal cynicism in the first eighteen months after arraignment for a sample of adolescent offenders. While there was no observed systematic change in perceptions, individuals' opinions did measurably oscillate during the study period.

<sup>20</sup> This disparity is presented with the caveat that the more citizens called the police, the less satisfied they were with police performance (Cheurprakobkit 2000). Further, the effect of being the initiator may be confounded by perceptions of the services rendered (see Brown and Benedict 2002 for an extensive summary).



mechanisms (i.e. perceptions formed through personal experiences and through vicarious experiences).

Personal Experiences. As previously stated, while individuals' perceptions about procedural justice are largely anchored in prior beliefs, they may be recalibrated or updated with each additional experience. The typical citizen has very few interactions with police, with only 16.9 percent of Americans aged sixteen years and older coming into contact with police in 2008 (Eith and Durose 2011). As such, each experience between an average citizen and the police is likely to be important to shaping their perceptions. However, if one has many interactions with police, as in the case of a serious or chronic offender, the likelihood that an exchange will measurably affect their perceptions is much less. Using the same panel dataset employed in this dissertation (Pathways to Desistance), Augustyn (2016) found that each arrest in a serious adolescent offender's criminal history did not carry equal weight in influencing their perceptions of procedural justice. Instead, there is a threshold such that after one acquires fifteen arrests, a new arrest is no longer significantly influential on their judgments of procedural justice (Augustyn 2016:18). Thus, the influence of one's personal experiences with the police is important to shaping the opinions of both average citizens and offenders; however, amongst chronic offenders, the influence of these interactions diminishes over time.

Importantly, the impact of involuntary contact with the police on procedural justice perceptions can be mediated by evaluations of fairness of police actions, and judgments about whether the police were acting lawfully (Tyler et al. 2014). No matter how the contact was initiated, dissatisfaction was more likely when people

interacted with officers they perceived as unfair, rude, unconcerned, unhelpful, or unprofessional, than if they perceived that they were treated fairly and with respect (Cheurprakobkit and Bartusch 2001; Tyler 1990; Tyler and Huo 2002). However, how an individual updates their initial procedural justice judgments appears to be asymmetrical: those who evaluate police more negatively experience less positive changes in their perceptions (Augustyn 2016; Skogan 2006). This is indicative of a negativity bias, or trend of prior perceptions influencing successive attitudes (Augustyn 2016; Baumeister et al. 2001; Rosin and Royman 2001). The implications of this bias on offenders is particularly critical considering that if individuals' perceptions of police do improve, the likelihood of complying with the law does as well (Augustyn 2015, 2016; Fagan and Piquero 2007; Penner et al. 2014).

Vicarious Experiences. In addition to one's personal experiences with police, either through initiating contact or having police initiate contact, perceptions of procedural justice may also be updated to include information obtained through vicarious experiences (Augustyn 2016). Again, given the relative infrequency of contact between the police and average citizens, much of the general public's perceptions are formed through secondary means—media, family, friends, and other social networks (Eith and Durose 2011; Rosenbaum et al. 2005). Adolescent offenders' perceptions may also be influenced by the experiences of friends and family (Brunson 2007; Warr 2002). Aside from providing additional information about police-community interactions, individuals may also refer to the experiences of their peers to determine if they received equitable treatment—an important component of procedural justice (Bednar and Fisher 2003; Tyler 2000).

A study of randomly selected Chicago residents' attitudes before and after direct contact with the police found that the interpersonal encounters were not enough to change attitudes, whereas vicarious experience did influence attitudes in a predictable way (Rosenbaum et al. 2005; Skogan 2005; Skogan et al. 2003).<sup>21</sup> Conversely, in a similar analysis that used the Pathways to Desistance data, the influence of personal experiences outweighed that of vicarious experiences in the updating of perceptions (Augustyn 2016). While the offenders' personal experiences with arrests could elicit subsequent positive perceptions of police procedural justice, the vicarious experiences of family and friends' arrests typically had a significant, negative effect. Thus, the role of vicarious experience appears to exert a different degree of influence on the perceptions of serious offenders relative to the general public, with the more naïve participants (i.e. Rosenbaum and colleagues' sample) relying more on vicarious sources of information, relative to personal experiences (see Pogarsky et al. 2004).

#### Other Factors Related to Individual's Perceptions of Police Procedural Justice

While it is clear that individuals' experiences with police, both personal and vicarious, are of great consequence in the formation of one's perceptions of procedural justice, other personal characteristics may also influence their opinions. For example, there is general agreement that youth, males, minorities, and those of lower socio-economic standing are more likely to perceive treatment by police or the

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<sup>21</sup> Rosenbaum and colleagues (2005:354) also found both negative and positive vicarious experiences with police to be associated with changes in attitudes toward the police, with the effects of positive vicarious experiences playing a greater role in changing attitudes toward police than negative vicarious experiences (i.e. a positivity bias).

criminal justice system as a whole as being unjust (Buckler et al. 2008; Engel 2005; Hadar and Snortum 1975; Hagan et al. 2005; Sampson and Bartusch 1998; Weitzer and Tuch 2002). However, the level of influence or association between these variables and individuals' perceptions continues to be debated.

Gender. There is little consensus with regard to the exact effect of gender on perceptions of the police (Brown and Benedict 2002). For example, whereas Jefferis and colleagues (1997: 389) find "males are somewhat more likely than females to believe that the police use too much force," others have concluded that males view the police more favorably than females (Correia et al. 1996). Additionally, Cao and colleagues (1996) concluded that women have more confidence in police than men, while others found females (in addition to whites and older people) to set the most rigorous police standards (Hadar and Snortum 1975). Several studies have also concluded that gender has no effect on perceptions of police (e.g. Sampson and Bartusch 1998; Smith and Hawkins 1973; see Brown and Benedict 2002).

Age. There is somewhat clearer evidence to support a relationship between age and attitudes toward the police, with age behaving as one of the most consistent predictors of perceptions of the police (Brown and Benedict 2002). Generally, younger people have been found to hold less favorable views of the police than older individuals (Dunham and Alpert 1988; Wu et al. 2009; Weitzer and Tuch 2002). This trend has been attributed to several possible explanations including that younger individuals are more freedom-oriented, while older individuals are more security and safety-oriented (Gaines et al. 1994). Furthermore, younger individuals are more likely to have more frequent and more negative contacts with police, given that they are

responsible for a disproportionate amount of crime (Bittner 1990; Walker 1992; Wellford 1973).

Findings about the importance of age relative to other factors, such as race and gender are mixed. For example, while Wilson (1983) asserts that age matters more than ethnicity and gender with regard to perceptions of police, others suggest that age has an inconsistent effect (e.g. Correia et al. 1996; Smith and Hawkins 1973). More recently, Augustyn (2015) found age to have a direct effect on serious adolescent offenders' perceptions of procedural justice. Specifically, age conditioned the effect of individual arrests on the degree of change in perceived procedural justice.

Race/Ethnicity. The effects of race and ethnicity on perceptions of police have been studied extensively (see Brown and Benedict 2002 for a comprehensive list of this research). These studies have found whites to view police more positively than non-whites (Block 1971; Furstenberg and Wellford 1973; Reisig and Parks 2000; Smith and Hawkins 1973), and have identified large variation between non-white groups (Jacob 1971). Both national and local surveys have shown enduring differences in attitudes toward the police by racial groups, with blacks having substantially less confidence in police than whites (Maguire and Pastore 2004). Blacks are also more likely than whites to report that they had a negative experience with police, and to feel that they did not receive fair or equitable treatment (Dean 1980; Tyler and Huo 2002; Weitzer and Tuch 2005). Generally, Hispanics' perceptions of the police have been measured as less positive than whites but more positive than blacks' (Hadar and Snortum 1975; Skogan et al. 2003; Tuch and Weitzer 1997; Weitzer and Tuch 2005).

This trend is not unique to the United States, as studies in the United Kingdom have also found black respondents to hold less positive views of police than whites (Jefferson and Walker 1993; Smith 1991; Waddington and Braddock 1991). Nor is this disparity unique to the current adversarial climate between police and minority communities, as Thomas and Hyman (1977) found race to be the best predictor of evaluations of police performance relative to gender, age, income, education, occupation, victimization, and residence; and that the majority of blacks were highly critical of police. Additionally, racial disparities in perceptions of police are not necessarily explained by criminality, as black individuals who had not previously been arrested perceived the police just as negatively as those individuals that had been arrested (Smith and Hawkins 1973).<sup>22</sup>

#### Group Level Perceptions of Police Procedural Justice

This dissertation seeks to understand the dynamics of serious adolescent offenders' perceptions of police procedural justice at both the individual level (i.e. understanding how these adolescents' perspectives change over time), and in the context of the police district in which they reside. A wealth of procedural justice research has been conducted at the individual level across a wide array of topics, many of which were summarized above. However, less is known about how macro-level influences, such as neighborhood characteristics, relate to the perceptions of that area's residents—particularly when the residents are known offenders.

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<sup>22</sup> Similarly, in a study of felonious offenders, Casper, Tyler, and Fisher (1988) found race (coded as black and nonblack), prior criminal record, and seriousness of arrest charge were not significantly related to perceptions of procedural justice when other variables such as treatment by police at arrest, sentence length, and mode of disposition, were accounted for. This study did not focus specifically on police, but the criminal justice system more broadly.

Broadly, there is evidence to suggest that perceptions of police procedural justice and legitimacy vary across geopolitical and social sectors. For example, research suggests that overall attitudes toward the police differ according to one's neighborhood context (Dunham and Alpert 1988; Reisig and Parks 2000; Sampson and Bartusch 1998; Wu et al. 2009). Furthermore, perceived social-psychological benefits of procedural justice and perceptions of what procedurally just conduct looks like may fluctuate across individuals and cultures (Lind and Tyler 1988; Tyler 1994, 1997; Wolfe et al. 2015). For example, a study of English residents revealed that while the impact of procedural justice on one's obligation to obey did not systematically vary according to age, gender, ethnicity, prior victimization, prior police contact, and neighborhood context, process fairness had a stronger effect on trust in police for individuals with higher reported fear of crime, and higher levels of perceived disorder in their neighborhoods (Jackson et al. 2013). Other research has found police performance evaluations to impact cooperation more than procedural justice in areas with historically strained or alienated relationships with the police, including Ghana, South Africa, and Pakistan (Bradford et al. 2014; Jackson et al. 2013; Tankebe 2009).

Research on procedural justice at the macro-level has focused much attention on group dynamics through the "group-value" or "group enforcement" models of collective identities. Lind and Tyler (1988) proposed a group-value model to explain variation in perceptions of legitimacy based on the idea that people identify with different social groups. These groups can offer a sense of identity, status, and prestige, providing members with resources, knowledge, and social rewards.

According to this perspective, individuals value their group membership and its associated status, and are typically unwilling to jeopardize their standing in the group by defying authorities, such as law enforcement (Lind and Tyler 1988). When group members feel they have been treated in a procedurally just way—perceiving authorities as trustworthy, respectful, and unbiased—individuals’ self-perception as valuable group-members are reinforced; if they feel they have not been treated in a procedurally just way, the sense of obligation to obey laws and legal agents declines (Lind and Tyler 1988, 1992).<sup>23</sup>

The subsequent “group-engagement model” adds an interpersonal element to the group-value model, asserting that people need to be engaged and feel like valued members of a group in order for their membership to influence their perceptions and associated behaviors (Tyler and Blader 2003). Tyler and Blader (2003) found that group members were more willing to consent to legal authorities’ directives when police and court procedures were consistent with what they believed to be a fair process, and when people believed their motives were trustworthy. While the “groups” alluded to in the group-value and group-engagement models can include an entire municipality or society, they may also refer more locally to neighborhoods or even social and cultural groups. Depending on how these social groups are geographically distributed, we might expect significant heterogeneity in perceptions of police procedural justice across neighborhoods or police districts. Further, it is quite possible that the perceptions of serious adolescent offenders would be the most

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<sup>23</sup> Lind and Tyler (1988) do suggest that procedural justice is not likely to be equally important to all individuals or group members. Individuals who are more strongly connected to their group are more likely to seek procedurally fair treatment as a way to confirm their value in their group; conversely loosely connected individuals’ motivation to care about fair procedures is less stable.



negative, as they are likely to feel marginalized from the pro-social population encouraging the enforcement of laws.

Research supports the idea that some marginalized classes, such as racial groups, perceive significantly lower levels of police procedural justice (Tyler 2005). However, there is little evidence that race alone is a direct cause of poorer perceptions of police; instead when other factors are accounted for, such as neighborhood crime, disorder, quality of encounters, and demographic variables, the effect of race was largely reduced (Cao et al. 1996; Horowitz 2007; NIJ 2016). Instead, race or ethnicity may serve as a proxy for variables such as neighborhood socialization (Dunham and Alpert 1988). Neighborhood conditions or neighborhoods with a higher proportion of blacks could also negatively influence the way police are evaluated by providing more opportunities to associate with others who hold negative sentiments; or because as the number of blacks increases, the potential for adversarial exchanges between black residents and the police increases (Apple and O'Brien 1983).

Further, there is evidence to indicate that the influence of race is not uniform across geography. For example, Skogan (1978) found that while blacks in Philadelphia, Chicago, St. Louis, and Los Angeles perceived the police more negatively than whites, these black-white differences were not found in Denver or Atlanta. Neighborhood level perceptions of police have also been tied to fear of crime. For instance, satisfaction with police is generally lower in neighborhoods with higher crime rates, and greater fear of crime, after controlling for race (Reisig and Parks 2000; Sampson and Bartusch 1998). Thus, the literatures on the macro-level influences on perceptions of procedural justice, and perceptions of procedural justice

measured at the macro-level appear to demonstrate a complex relationship between group membership and geography. Race, disorder, or geography alone cannot explain differences in perceptions of police procedural justice and legitimacy at this level. Consequently, this multifaceted dynamic makes it particularly difficult to identify an appropriate police strategy, or array of strategies to improve perceptions of procedural justice.

#### Police Strategies and Procedural Justice

Generally speaking, the procedurally just approach to policing introduced by Tyler and many of his colleagues provides guidelines for how interactions between police and civilians should occur. For example, these exchanges should allow the citizens to voice their opinion, and be conducted with respect and fairness (Tyler 1990). This approach to communicating and interacting with the public has been demonstrated to be associated with more favorable perceptions of the police (Tyler 1990; Tyler and Huo 2002). That said, this communication does not occur in a vacuum; instead it is implemented within the larger context of policing strategies, or approaches to crime control.

There are examples of controversial police strategies or incidents that have affected police approval ratings and perceptions of procedural justice. For instance, the stop, question, and frisk practices employed by the New York City Police Department, among many others, were shown to influence adolescents' perceptions of police procedural justice (Tyler et al. 2014). Employing a cross-sectional analysis, Tyler and colleagues (2014) found that while the impact of these stops was mediated by individuals' evaluations of police fairness and lawfulness, perceptions of fairness

and lawfulness could be undermined by the widespread use of the stops, and the degree of police intrusion that occurred. Similarly, a study of young men's experiences with order maintenance policing found that the strategy damaged their views of procedural justice, and consequently perceptions of police legitimacy and crime control (Gau and Brunson 2010).<sup>24</sup> In a more severe example, approval ratings were compared before and after three notorious police brutality incidents in the Los Angeles, California area: the 1979 killing of Eulia Love, the 1991 beating of Rodney King, and the 1996 beatings of two Mexican immigrants (Tuch and Weitzer 1997). Using survey data from the National Opinion Research Center (NORC), Gallup, another national survey, and *Los Angeles Times* polls, Tuch and Weitzer (1997) found substantive declines in police approval ratings following each incident.<sup>25</sup> Thus, it is clear that certain policing strategies can in fact have a direct impact on perceptions of police procedural justice, legitimacy, and approval.

One approach that has not been studied with regard to its impact on perceptions of procedural justice, is the practice of sending a disproportionate number of police and resources to high crime precincts or districts, as was done in Philadelphia in 2008. This strategy, which is similar to hotspots policing, does not necessarily dictate what the officers do when they are in the high crime areas, in contrast to the specific tactics outlined in stop, question, frisk, and broken windows. However, it is quite possible that the increased presence of police in one's community

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<sup>24</sup> Order maintenance policing invokes the "broken windows" hypothesis of Wilson and Kelling (1982), which suggests that maintaining order through targeting minor offenses can reduce disorder and potentially deter more serious offenses.

<sup>25</sup> To be clear, while "police brutality" is not an explicit strategy that would be employed by a law enforcement agency such as the Los Angeles Police Department, the lack of an enforced use-of-force policy, or a culture of aggression can be representative of greater department policies or cultures at the time of the incident (Herbert 1996).

through a hotspot policing type of approach can influence perceptions of procedural justice. The Crime Fighting Strategy is not explicitly hot spots policing, which typically refers to identifying a concentrated area of a few street blocks (if not less) and sending police officers and resources to that area. Identifying high crime police districts, such as in the Crime Fighting Strategy, utilizes the somewhat arbitrary geographic distinctions to classify areas of highest crime. In other words, instead of looking at a map of crime distribution and identifying where the most crime has occurred as is done in a hot spots model, this approach ranked police districts in the order of most to least violent crime.

As stated in the previous subsection, perceptions of police have been associated with fear of crime, even after accounting for variation in demographic variables (Reisig and Parks 2000; Sampson and Bartusch 1998). There is an ongoing debate within the policing literature that questions whether labeling an area as a hotspot, or in this case a “target”, may actually increase the fear of crime among residents in the targeted areas (Rosenbaum 2006; Weisburd and Braga 2003; Weisburd 2004). This “backfire” effect of targeted policing can lead to heightened perceptions of crime problems and lower satisfaction with police (Pate et al. 1986; Weisburd et al. 2011).<sup>26</sup> Thus, it is possible that regardless of the activity engaged in by police in Philadelphia in 2008, the act of labeling the nine high crime districts as “targets” and sending more police and resources there, may have led some residents to alter their perceptions of the police. Further, most if not all of the research regarding the effects of targeted policing on fear of crime has captured the

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<sup>26</sup> This is a debated topic, as a recent experimental analysis of broken windows policing in hot spot street segments, which included a panel telephone survey of people living in the treatment and control areas, found no evidence of any backfire effects (Weisburd et al. 2011).

perceptions of adult residents, rather than adolescent offenders. It is unclear what effect this type of policing strategy would have on adolescent offenders' perceptions of police.

Additionally, study of backlash effects in Northern Ireland, as it relates to government intervention and terrorism has found an escalating effect. LaFree and colleagues (2009) concluded that government responses to violence actually emboldened criminals already participating in terrorist activity, and encouraged others to join or support the effort. As such, intervention may not just increase perceptions of fear and violence, but may actually enhance future levels of violence (LaFree et al. 2009).

Fear of crime and the so-called backfire effect is just one example of a potential mechanism that could link targeted policing to changes in perceptions of police procedural justice. It is also possible that by increasing the number of officers in a specific area, there are more opportunities for individuals to witness police-citizen interactions. For typical non-offending citizens, who are unlikely to often come into contact with the police, this could provide more opportunities to develop opinions about them. For serious adolescent offenders, more opportunities to witness police exchanges provide more chances to compare their own treatment to how they see police treating others.

In sum, it is unclear what effect increasing the number of police in high crime police districts would have on perceptions of procedural justice, but it is certainly possible that sending more officers to targeted areas, as was outlined in the Philadelphia Crime Fighting Strategy, could have a detrimental impact. This

particular question is one that until now, has not been a part of the extensive literature estimating the impact of the number of police on a variety of outcomes.

### *Estimating the Effects of Increasing the Number of Police*

The central goal of this dissertation is to understand the causal impact of increasing the police presence in Philadelphia's target districts on perceptions of procedural justice. While the present review of procedural justice policing makes clear this particular question has yet to be addressed in the literature, a body of research spanning several decades has attempted—with mixed success—to estimate the causal impact of police on other outcomes. Undoubtedly, the most studied of these relationships is the effect of more police on crime rates (Nagin 1998). While changes to crime rates are not necessarily directly indicative of changes in perceptions of procedural justice, the literature provides examples of effective causal identification strategies for estimating the effect of more police, using innovative methods such as instrumental variable analyses and natural experiments.

Early attempts to estimate this effect relied largely on cross-sectional data and found no relationship or, surprisingly, a positive relationship between police and crime (see Cameron 1988; Eck and Maguire 2000; Nagin 1998; and Levitt and Miles 2006 for reviews of this topical literature). For example, Cameron (1988) reviewed twenty-two studies across a variety of cities and found eighteen to reveal null or positive relationships.<sup>27</sup> In instances where police did have a measurable impact on

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<sup>27</sup> These findings are unexpected, given the deterrence oriented nature of the criminal justice system, but are not inconsistent with some other studies reported around the same time. For example, George Kelling and colleagues (1974) conducted an experiment that randomized preventive police patrols in Kansas City, Missouri; fifteen police beats were randomly assigned to three different levels of service.

crime the returns on investment were estimated to be marginal: James Q. Wilson (1983) reported that an increased police presence in the New York subway system in the 1960s reduced the number of robberies slightly, but at a very high price per crime prevented. These early studies led many began to believe that police had little to no impact on crime, or that only large increases in police levels could provide a large enough presence to deter crime (Marvell and Moody 1996).<sup>28</sup>

A central problem to this area of research was endogeneity of police with respect to crime rates—that is, places with higher crime rates are more likely to have larger police forces, even if they are successful in preventing or reducing crime (Fisher and Nagin 1978).<sup>29</sup> The endogeneity problem explains why most of the studies surveyed by Cameron (1988) were not significant or suggested that the number of police was correlated with increases in crime: the simultaneity of the police-crime relationship was not properly addressed. To further demonstrate this issue, Marvell and Moody (1996) reviewed thirty-six studies that regressed crime on police levels or police levels on crime; the studies provided little evidence that police reduce crime but suggested that more crime does in fact lead to more police. More than half of the studies reviewed made no effort to address simultaneity (Marvell and Moody 1996).

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The researchers found that increasing or decreasing the intensity of police patrol had no effect on crime, service delivery, or perceptions of safety. However methodological criticisms regarding issues such as the study's lack of statistical power, led city mayors and police chiefs to believe that increasing patrols or visibility would not be an effective tactic (Larson 1976; Sherman 2002).

<sup>28</sup> Bayley (1994:3) famously declared that “the police do not prevent crime... [and] that the primary strategies adopted by modern police have been shown to have little or no effect on crime”.

<sup>29</sup> Another potential issue with early research is that when the size of a police force increases citizens may be more likely to reach out, police may be more likely to detect crimes, and police may have more time and resources to spend documenting petty crimes. However, the relationship between the likelihood a crime is reported and the level of police staffing has been demonstrated to be weak, suggesting the influence of reporting bias on reported crime data is small (Levitt 1996).

Numerous efforts to overcome the endogeneity problem and improve causal identification when estimating the impact of police have been utilized in the “second generation” of this line of research, which emerged in the 1990s (Levitt and Miles 2006). These approaches include the use of repeated cross-sectional or high-frequency time series data, individual rather than aggregate data, and employ creative instrumental variables (Corman and Mocan 2000; Evans and Owens 2007; Fisher and Nagin 1978; Grogger 1991; Levitt 1997; Tauchen et al. 1994). By relying on repeat measures, these newer studies track patterns and changes, while reducing issues related to bias and unobserved heterogeneity through the use of fixed effects and control variables (Levitt and Miles 2006). This “second generation” also includes a shift toward the use of economic methods to estimate the causal effects of changing police force strength. For example, Levitt (1997) treated the timing of mayoral and gubernatorial electoral cycles as an instrumental variable to estimate the effect of police on crime, and identified a causal negative effect: increasing the size of the police forces in election years was associated with substantial reductions in violent crime, and with a smaller decline in property crime.<sup>30</sup>

More recently, DiTella and Schargrodsky (2004) attempted to isolate the causal effects of police on crime by exploiting changes in police presence following a terrorist attack on a Jewish center in Buenos Aires, Argentina. The authors conducted a difference-in-differences analysis using data on the location of car thefts before and

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<sup>30</sup> While this research allowed for a potentially cleaner identification and more rigorous analysis than some other methods employed, McCrary (2002) found a weighting error in Levitt’s estimation procedure that when corrected nullifies his causal inferences regarding the effect of police on crime. Levitt’s approach has also been criticized for failing to consider the influence that election years might have on the reliability of crime statistics, which might be manipulated downward for the benefit of the incumbent (Marvell and Moody 1996).



after the attack. They found that fixed and observable police presence generated a significant decline in car thefts in the protected blocks (i.e. those with a Jewish center and heightened police presence) but no effect one or two blocks away, relative to the rest of the neighborhood, providing evidence of a causal deterrent effect of a heightened police presence. Similarly, in an analysis comparable to the present research, Machin and Marie (2005, 2011) conducted a program evaluation analysis of the Street Crime Initiative, a large scale policy intervention that allocated additional resources to some police force areas in England and Wales with the goal of reducing robberies. The authors estimated 22 difference-in-differences coefficients across areas that did and did not receive the treatment, and found that robberies fell significantly in areas that received additional police resources. By utilizing creative identification strategies with instrumental variables and natural experiments, these “second generation” studies have been more successful in estimating causal effects of adding more police to discrete areas. This dissertation follows this trend by exploiting the Crime Fighting Strategy as a “natural quasi-experiment” in order to estimate causal effects and overcome endogeneity issues.

#### *Data and Measurement Contributions*

In addition to the shortcomings of early police staffing research, many of the early studies regarding perceptions and attitudes of police were also limited due to heavy reliance on cross-sectional data, and largely descriptive analyses (Scaglione and Condon 1980). These studies primarily focused on socio-economic variables thought to be related to assessments of police and the criminal justice system (Albrecht and Green 1977; Bailey and Mendelsohn 1969; Scaglione 1973; Scaglione and Condon

1980). In addition to applying causal methods to a question that has yet to be asked, this dissertation also contributes to this area of research through its data collection and analytical strategies.

Overall, methods for measuring the public's perceptions have improved over time since some of the earliest police perception work was conducted by Parratt (1938), who proposed amending an existing "police service rating scale" to include citizen opinions and satisfaction.<sup>31</sup> Parratt's addition included 342 statements that covered eight topics: characteristics of personnel; selection, discipline, training and equipment; influence of politics; public and press relations and crime prevention; treatment of groups and minorities; treatment of suspects and witnesses; apprehensions and investigations; and vice. Parratt rightly identified some of the challenges involved in measuring public perceptions: the first is that the standards that guide approval and disapproval of police practices and behaviors at a given point in time must be understood; and second, there needs to be a way to determine what actually exists and what is desired or approved by citizen opinion. These may be difficult, as standards of approval may not align with the rule of law (e.g. gambling or prostitution at times); as such, measures of police effectiveness in enforcing statutes will not capture police effectiveness with regard to public approval (Parratt 1938).

More recently efforts have been made to develop survey instruments that can collect information regarding citizen attitudes toward the police, victimization,

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<sup>31</sup> The "Police service rating scale" was developed by Arthur Bellman with the assistance of August Vollmer for "rating of a police organization according to certain standards, and the improvement of the service" (Bellman 1935: 75). The instrument consisted of objective measures regarding department capabilities, practices, and investigative and crime fighting processes.

willingness to report crimes, and the effect of community policing strategies (Brann and Chaiken 1999). Surveys in particular have been used to assess officers' performances, police services, and police-community relations; in turn, findings have helped structure priorities, identify problems, and evaluate programs (Brown and Benedict 2002). In the past, the majority of the police-community survey research had been conducted in the United Kingdom, with far less taking place in the United States (Skogan 1996).

These surveys have also been used to assess the general public's perceptions and feelings about recent interactions with the police. Much of the foundational criminological procedural justice literature (e.g. Fagan and Tyler 2005; Tyler 1989, 1990; Tyler and Huo 2002) has drawn from Tyler's study of attitudes and behavior of a random sample of 1,575 Chicago citizens, and replications in other sites. The initial Chicago data were collected through phone interviews in 1984, and a random subset of 804 people interviewed one year later. Individuals were selected for inclusion if they had direct, personal contact with the authorities in the past twelve months, and if they had a personal stake in the situation (i.e. could not be a bystander or witness). However, the mean ages of those included in the sample was 42 years old, 52 percent were white, 43 percent were male, and 77 percent had at least a high school education (Tyler 2006: 13). Based on this description, most of the individuals in the sample were unlikely to be experiencing frequent or high stakes interactions with the police. As such, their experiences and subsequent perceptions were likely to be quite different from those of serious adolescent offenders.

In a similar scenario, Rosenbaum and colleagues (2015) evaluated a Police-Community Interaction (PCI) survey in 58 United States cities to measure the quality of police citizen encounters at the local level. Because most Americans do not have any contact with police during a given year, like Tyler (2006), this survey specifically targeted individuals who have personally interacted with the police. Measures included a four-point satisfaction scale (e.g. “taking the whole experience into account, how satisfied are you with the way you were treated by the officer in this case?”), four-point procedural justice scale (e.g. “during the encounter, the officer seemed trustworthy”), four-point assessment of department effectiveness (e.g. “how well they are doing at fighting crime”), demographics, officer behavior, and perceptions of safety, legitimacy, and community cooperation (Rosenbaum et al. 2015). Unlike Tyler’s measures, which were specific to Chicago, these data were able to capture agency level differences in public satisfaction, and uncover complex interactions involving race, type of incident, and procedural justice; however, the survey suffered from low response rates—particularly among youth and minorities (Rosenbaum et al. 2015). This limitation indicates that the perceptions of those who have the most strained relationships with the police are again underrepresented in what we know about perceptions of police procedural justice and legitimacy.

While surveys are necessary for capturing unobservable perceptions, such as feelings about the nature and legitimacy of policing, the prior studies have fallen short in terms of capturing longitudinal trends that require more than two waves, and capturing the perspectives of highest risk citizens—whose perceptions of procedural

justice and legitimacy are likely to have the greatest implications on issues of compliance and offending.

Researchers have begun to utilize Pathways to Desistance panel data on serious adolescent offenders to fill this void.<sup>32</sup> For example Piquero and colleagues (2005) conducted a trajectory analysis using these data, and found that perceptions of legitimacy and legal cynicism were relatively stable over the eighteen month study period; high perceptions of procedural justice related to police and the courts were associated with lower perceived legal cynicism and higher perceived legitimacy. Similarly, Fagan and Piquero (2007) have applied the Pathways to Desistance data in a study demonstrating procedural justice as an antecedent of legal socialization, but not rational choice; Augustyn (2015) used these data to show that the relevance of Tyler's procedural justice model varies across age of onset among offenders; and Lee and colleagues (2010) were using the Pathways to Desistance data when they found black youths with stronger senses of ethnic identity perceived more police discrimination, but more positive beliefs about police legitimacy. While the Pathways to Desistance data have clearly been applied to a wide array of procedural justice and legitimacy-oriented questions, these panel data have not been applied to questions regarding size of police force, or residential stability. Furthermore, they have not been exploited to address a more general hole in criminal justice literature, which asks how macro-level policies influence individual level perceptions.

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<sup>32</sup> The Pathways to Desistance dataset, sampling strategy, and data collection methodology are all described in detail in Chapter 3.

This particular line of inquiry is largely rooted in the deterrence literature, which assumes a link between macro-level policies (e.g. laws and associated sanctions for violating them) and individuals' perceptions of risk; the deterrence model suggests that enhancing punishments would increase perceptions of risk, and consequently reduce crime (Kleck et al. 2004; Paternoster 1987). If similarly applied to procedural justice policing, we might expect that changes in enforcement policies at the police district level to influence district residents' perceptions. However, the link between macro-level policies and individual perceptions has yet to be adequately tested—for deterrence or for procedural justice. Prior efforts to better understand the link between macro-level policies and individual perceptions have relied on weak causal claims, and used random samples of the general population rather than likely offenders, whom the macro-level policies target (e.g. Kleck et al. 2005; Kleck and Barnes 2014).

Thus, the present research will concurrently utilize panel data, monthly police department resource and crime data, and census data, all coded at the police district level, in order to improve upon prior methods, and address some of the gaps in the present research. By using longitudinal data coded at the level of service delivery, causal claims about the influence of a district level policing policy on perceptions of police procedural justice can be rigorously evaluated. Further, by exploiting the circumstances created by sending more police to target districts, while leaving non-target areas relatively unchanged, the influence of the number of officers on procedural justice outcomes can be estimated. The methods and data selected for the

present study are therefore carefully informed by the lessons provided in the extant literature.

## Chapter 3: Data

To address the research questions outlined in Chapter 1, this dissertation employs data from three independent sources. The main source of data is the Pathways to Desistance Study (Mulvey 2013), a prospective longitudinal study of serious adolescent offenders.<sup>33</sup> Additionally, the Philadelphia Police Department has provided longitudinal administrative data, which include information on officers, arrests, and crimes reported for a five year period. Lastly, data from the 22<sup>nd</sup> decennial census, Census 2000, were coded at the police district level by the University of Pennsylvania Cartographic Modeling Laboratory. Each of these datasets has been coded according to police district so that they may be used together to answer questions both at the district and individual level.

By joining panel data from the Pathways to Desistance Study with longitudinal official data while exploiting the selective implementation of the Philadelphia Crime Fighting Strategy, this study seeks to avoid the identification, simultaneity, and endogeneity issues that plagued earlier studies attempting to estimate the causal impact of the number of police. As stated by Corman and Mocan:

The main problem with cross-sectional data is identification. If crime, police, arrests, and drug use are all determined simultaneously, it is difficult to find enough exogenous variables to be meaningfully excluded from some of the equations to allow identification. Using a time series of high frequency allows us to circumvent most of the simultaneity issues, as well as allowing an exploration of some of the dynamics of criminal behavior (2000: 590).

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<sup>33</sup> The study is coordinated through the University of Pittsburgh Medical Center and the data are distributed through the Inter-university Consortium for Political and Social Research (ICPSR).



By using panel and longitudinal data, described in this chapter, many of the issues that affected earlier research are eluded. Further, by using monthly police reports documenting the number of police officers per police district (relatively high frequency for municipal reporting), some issues of simultaneity may be evaded.

### Data Sources

#### The Pathways to Desistance Study

The Pathways to Desistance Study was conducted with the aim of identifying patterns in serious adolescent offenders' desistance (i.e. cessation of antisocial activity), and understanding the role of social context, developmental changes, sanctions, and interventions in promoting desistance. The data capture changes in behavior, psychological functioning, and the transition into adult roles through repeated measures using self-report, interviews with collateral reporters, and official record data (Schubert et al. 2004). The self-report data are from 1,354 serious adolescent offenders located in Philadelphia, PA and Phoenix, AZ, enrolled over a 26 month period between November 2000 and January 2003. To be considered for inclusion, the adolescents had to be found guilty of a serious offense (primarily felonies, with the exception of some misdemeanor property, sexual assault, or weapons offenses), be between the age of 14 and 18 at the time of their committing offense, and provide informed assent or consent. The proportion of male youths found guilty of a drug offense was capped at 15 percent to avoid an over-representation of drug offenders. All females, and all youths being considered for trial in the adult system who met the age and crime criteria were approached for enrollment (i.e. no

drug crime cap was imposed). Of those approached to participate, 20 percent declined (Schubert et al. 2004).

Study participants that were adjudicated in the juvenile justice system completed a baseline interview within 75 days of the petition date; those processed as adults completed a baseline interview within 90 days of the decertification or arraignment hearing in Philadelphia, or Phoenix, respectively.<sup>34</sup> Follow-up interviews were conducted over the course of the 84 months past the baseline, spanning as late as March 2010. The first six follow-up interviews (waves one through six) occurred at six month intervals, and waves seven through ten occurred at 12 month intervals. Additionally, release interviews were conducted within 30 days of being released from a stay in a residential facility. Interviews included repeated assessments of the adolescents' psychological development, behavior, relationships, mental health, and experiences in the juvenile or criminal justice system. The self-reported interview data were supplemented and validated with FBI arrest records and juvenile and adult court records. Family members and friends were also interviewed as a part of the study.

The present study employs data from the N=700 participants that were enrolled in Philadelphia (Table 3.1).<sup>35</sup> These individuals were disproportionately black (72 percent) and male (86 percent). Participants from Philadelphia were a mean of 16.61 years old at the time of their baseline interview, with the youngest being

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<sup>34</sup> In Philadelphia a decertification hearing determines if the case will remain in adult court, or be sent back to juvenile court. During arraignment hearings in Phoenix, charges are formally presented, and the defendant has the opportunity to plead guilty or not guilty to the charges. There is no waive-back provision to juvenile court under Arizona law (Schubert et al. 2004).

<sup>35</sup> Participants from the Phoenix sample were excluded from this study, as it is an analysis of a police policy shift specific to Philadelphia, PA.

14.05 and oldest being 19.5 years old. Most of these individuals had been engaging in crime for at least one year prior to baseline, with the average age of their first offense being 14.92 years.

Within the Philadelphia sample, this study was particularly interested in the individuals for whom geographic residence information was available, so that trends could be analyzed at the police district level. The Pathways to Desistance data coded individuals' addresses at the census block group level. I spatially joined Geographic Information System (GIS) shapefile layers depicting the census block groups and police districts within Philadelphia city limits; using these two overlapping files, I was able to identify which police district each subject resided in, based on their census block group. The police district in which one resides was recorded for each of the ten follow-up interview waves, indicating if an individual relocated within the city; however, this information was not available for all Pathways participants, decreasing the Philadelphia sample of N=700 to a mean sample size of 249.7 per wave (Tables 3.1 and 3.2).

Table 3.1: Baseline Measures of Wave 1-10 Sub-Samples and Full Philadelphia Sample

| Baseline Measures   | Full Sample     | Wave 1 Sample    | Wave 2 Sample     | Wave 3 Sample     | Wave 4 Sample   | Wave 5 Sample   | Wave 6 Sample   | Wave 7 Sample               | Wave 8 Sample   | Wave 9 Sample   | Wave 10 Sample   |
|---|-----------------|------------------|-------------------|-------------------|-----------------|-----------------|-----------------|-----------------------------|-----------------|-----------------|------------------|
| N   | 700             | 193              | 233               | 269               | 253             | 269             | 277             | 263                         | 252             | 252             | 236              |
| Age at Baseline Interview (yrs.)  | 16.61<br>(1.15) | 16.40*<br>(1.14) | 16.55<br>(1.16)   | 16.53<br>(1.12)   | 16.52<br>(1.13) | 16.52<br>(1.12) | 16.59<br>(1.58) | 16.43**<br>(1.16)           | 16.51<br>(1.14) | 16.50<br>(1.13) | 16.59<br>(1.13)  |
| Age at First Prior (yrs.)   | 14.92<br>(1.54) | 15.12*<br>(1.38) | 14.97<br>(14.97)  | 14.92<br>(14.92)  | 14.94<br>(1.45) | 14.89<br>(1.48) | 14.92<br>(1.54) | 14.91<br>(1.45)             | 14.93<br>(1.53) | 14.89<br>(1.57) | 15.10<br>(15.07) |
| Male  | 0.86            | 0.78**           | 0.80*             | 0.82 <sup>†</sup> | 0.80*           | 0.79**          | 0.80*           | 0.78***                     | 0.79**          | 0.81*           | 0.77**           |
| Black   | 0.72            | 0.71             | 0.70              | 0.71              | 0.74            | 0.74            | 0.74            | 0.71                        | 0.73            | 0.74            | 0.72             |
| Hispanic  | 0.15            | 0.16             | 0.13              | 0.15              | 0.15            | 0.13            | 0.13            | 0.16                        | 0.13            | 0.13            | 0.17             |
| White   | 0.10            | 0.10             | 0.14 <sup>†</sup> | 0.11              | 0.09            | 0.12            | 0.11            | 0.10                        | 0.11            | 0.10            | 0.09             |
| Police Procedural Justice – Personal Experience ( <i>Likert: 1-5</i> )  | 2.73<br>(0.52)  | 2.75<br>(0.55)   | 2.71<br>(0.54)    | 2.70<br>(0.55)    | 2.73<br>(0.55)  | 2.70<br>(0.54)  | 2.74<br>(0.55)  | 2.77<br>(0.54)              | 2.72<br>(0.53)  | 2.69<br>(0.53)  | 2.72<br>(0.54)   |
| Police Procedural Justice – Vicarious Experience ( <i>Likert: 1-5</i> ) | 2.64<br>(0.68)  | 2.65<br>(0.66)   | 2.62<br>(0.69)    | 2.61<br>(0.68)    | 2.65<br>(0.70)  | 2.63<br>(0.68)  | 2.66<br>(0.69)  | 2.72 <sup>†</sup><br>(0.68) | 2.69<br>(0.69)  | 2.68<br>(0.67)  | 2.67<br>(0.68)   |

*t*-test compared baseline measures of individual sub-samples to the full sample from which they were derived

<sup>†</sup>*p*<0.10, \**p*<0.05, \*\**p*<0.01, \*\*\**p*<0.001

Table 3.2: Baseline Measures of Individuals Excluded from Wave 1-10 Sub-Samples

| Baseline Measures   | Full Sample     | Wave 1 Sample   | Wave 2 Sample   | Wave 3 Sample     | Wave 4 Sample   | Wave 5 Sample   | Wave 6 Sample   | Wave 7 Sample    | Wave 8 Sample   | Wave 9 Sample   | Wave 10 Sample  |
|---|-----------------|-----------------|-----------------|-------------------|-----------------|-----------------|-----------------|------------------|-----------------|-----------------|-----------------|
| N   | 700             | 507             | 467             | 431               | 447             | 431             | 423             | 437              | 448             | 448             | 464             |
| Age at Baseline Interview (yrs.)  | 16.61<br>(1.15) | 16.69<br>(1.14) | 16.65<br>(1.14) | 16.66<br>(1.16)   | 16.67<br>(1.15) | 16.67<br>(1.16) | 16.63<br>(1.14) | 16.73*<br>(1.12) | 16.67<br>(1.15) | 16.68<br>(1.15) | 16.63<br>(1.16) |
| Age at First Prior (yrs.)   | 14.92<br>(1.54) | 14.85<br>(1.58) | 14.89<br>(1.56) | 14.92<br>(1.58)   | 14.91<br>(1.58) | 14.94<br>(1.57) | 14.92<br>(1.53) | 14.92<br>(1.59)  | 14.92<br>(1.54) | 14.94<br>(1.52) | 14.85<br>(1.58) |
| Male  | 0.86            | 0.89*           | 0.89*           | 0.89 <sup>†</sup> | 0.90*           | 0.91***         | 0.90**          | 0.92***          | 0.90**          | 0.90*           | 0.91***         |
| Black   | 0.72            | 0.72            | 0.73            | 0.72              | 0.70            | 0.71            | 0.70            | 0.72             | 0.71            | 0.71            | 0.72            |
| Hispanic  | 0.15            | 0.15            | 0.16            | 0.15              | 0.15            | 0.17            | 0.17            | 0.15             | 0.17            | 0.17            | 0.15            |
| White   | 0.10            | 0.10            | 0.08            | 0.10              | 0.11            | 0.09            | 0.10            | 0.11             | 0.10            | 0.11            | 0.11            |
| Police Procedural Justice – Personal Experience ( <i>Likert: 1-5</i> )  | 2.73<br>(0.52)  | 2.72<br>(0.51)  | 2.74<br>(0.51)  | 2.75<br>(0.50)    | 2.73<br>(0.50)  | 2.75<br>(0.51)  | 2.72<br>(0.50)  | 2.70<br>(0.51)   | 2.74<br>(0.51)  | 2.75<br>(0.51)  | 2.74<br>(0.51)  |
| Police Procedural Justice – Vicarious Experience ( <i>Likert: 1-5</i> ) | 2.64<br>(0.68)  | 2.64<br>(0.69)  | 2.65<br>(0.68)  | 2.66<br>(0.68)    | 2.64<br>(0.67)  | 2.65<br>(0.68)  | 2.63<br>(0.68)  | 2.59<br>(0.68)   | 2.62<br>(0.67)  | 2.62<br>(0.69)  | 2.62<br>(0.68)  |

*t*-test compared baseline measures of individual sub-samples to the full sample from which they were derived

<sup>†</sup>*p*<0.10, \**p*<0.05, \*\**p*<0.01, \*\*\**p*<0.001

The participants for whom geographic information was available at each wave were demographically comparable to the full Philadelphia sample, with similar ages at baseline and first offense, and ethnic makeup (Table 3.1). The one exception is that the sub-samples across the ten waves had a significantly lower proportion of male to female participants. Importantly, the baseline measures of the procedural justice outcomes of interest (described later in this chapter) for the full Philadelphia sample and were not statistically distinct from the wave 1-10 sub-samples for which geographic information was available.<sup>36</sup>

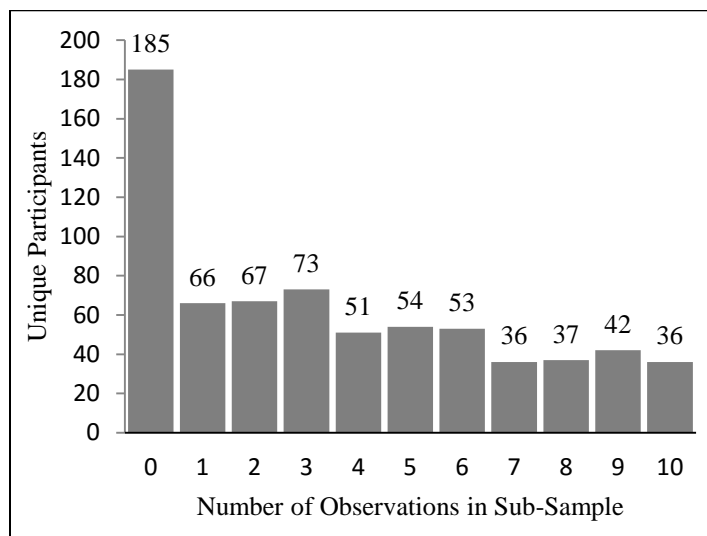
These trends also held for all Pathways participants that were excluded from particular waves for not having geographic information available; those that were excluded from any one of waves one through ten had baseline measures that were comparable to the full sample using the same criteria as in Table 3.1 (Table 3.2). Again, the only significant difference was percent male (predictably, the excluded participants were significantly more male across sub-samples). Those who were excluded from specific waves spent more time incarcerated or in residential facilities than those who were included. At any of the ten follow-up waves, those who were included in the sub-sample spent the majority of their time outside of confinement or other residential facilities (proportion of street time:  $\bar{x} = 0.84$ ;  $min = 0$ ;  $max = 1.0$ ), whereas those who were excluded from the subsample due to missing geographic information, spent a lower proportion of time on the street ( $\bar{x} = 0.52$ ;  $min = 0$ ;  $max = 1.0$ ).

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<sup>36</sup> Note that the measures being compared in Tables 2 and 3 were all recorded at baseline. This comparison was used to determine if the subsamples of participants during each of those waves looked like the other participants at the outset of the study. The actual measures used during analyses will come from all ten waves.

Importantly, the same participants were not used across all ten waves; of the 700 individuals in the Philadelphia sample, only 185 were never included in a single one of the waves in this study, and only 36 were included in all ten waves (Figure 3.1). Of the 515 who were in at least one wave, the average number of interview waves with geographic information was 4.85.

Figure 3.1: Number of Observations Provided by Each Participant in Subsample (n=700)



Thus, this sub-sample of the full Philadelphia sample includes data from 515 unique participants with an average of 4.85 observations each. As might be expected, serious adolescent offenders are not uniformly distributed throughout the city, with districts containing between as few as zero and as many as 33 participants during the ten waves (Table 3.3; Figure 3.2). That said, the average number of Pathways participants in any one of the 23 police districts across all waves was always less than ten percent of the sample. On average across waves one through ten, the 15<sup>th</sup> District had the most pathways participants ( $\bar{x} = 24.3$ , or 9.7 percent of participants), while the 3<sup>rd</sup> and 5<sup>th</sup> Districts contained the fewest ( $\bar{x} = 1.7$ , or 0.7 percent).

Figure 3.2: Mean Distribution of Pathways Subjects across Waves 1-10 (percent)

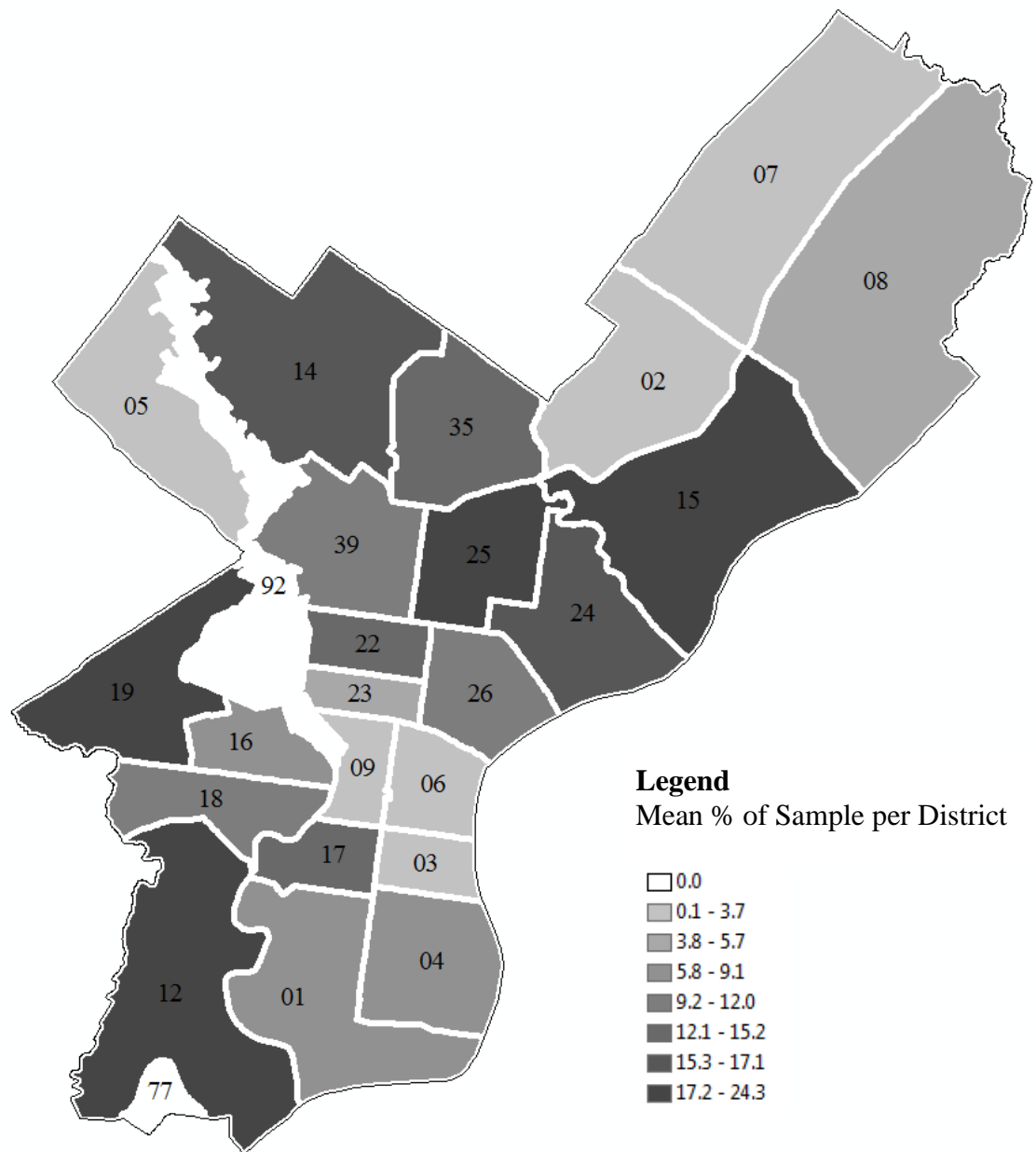




Table 3.3: Distribution of Participants across Police Districts during Waves 1-10 (N)

| Police District | Wave 1 | Wave 2 | Wave 3 | Wave 4 | Wave 5 | Wave 6 | Wave 7 | Wave 8 | Wave 9 | Wave 10 | Mean  |
|-----------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|---------|-------|
| 1               | 7      | 10     | 13     | 9      | 11     | 10     | 11     | 8      | 6      | 6       | 9.1   |
| 2               | 3      | 4      | 5      | 6      | 5      | 2      | 2      | 3      | 3      | 4       | 3.7   |
| 3               | 1      | 0      | 0      | 0      | 2      | 0      | 2      | 3      | 4      | 5       | 1.7   |
| 4               | 6      | 9      | 9      | 9      | 8      | 12     | 11     | 8      | 8      | 6       | 8.6   |
| 5               | 0      | 2      | 1      | 4      | 3      | 2      | 1      | 2      | 2      | 0       | 1.7   |
| 6               | 3      | 3      | 4      | 3      | 4      | 5      | 5      | 1      | 1      | 1       | 3.0   |
| 7               | 2      | 2      | 2      | 3      | 2      | 1      | 2      | 1      | 2      | 1       | 1.8   |
| 8               | 4      | 6      | 4      | 2      | 3      | 6      | 8      | 6      | 6      | 10      | 5.5   |
| 9               | 3      | 4      | 5      | 4      | 4      | 3      | 1      | 2      | 2      | 1       | 2.9   |
| 12              | 18     | 18     | 19     | 20     | 19     | 24     | 26     | 26     | 27     | 20      | 21.7  |
| 14              | 17     | 15     | 16     | 22     | 22     | 26     | 19     | 14     | 11     | 9       | 17.1  |
| 15              | 15     | 21     | 20     | 19     | 29     | 22     | 25     | 31     | 33     | 28      | 24.3  |
| 16              | 3      | 5      | 10     | 10     | 8      | 9      | 8      | 9      | 11     | 12      | 8.5   |
| 17              | 11     | 15     | 14     | 14     | 16     | 14     | 10     | 14     | 16     | 15      | 13.9  |
| 18              | 10     | 12     | 18     | 17     | 13     | 15     | 11     | 10     | 8      | 6       | 12.0  |
| 19              | 17     | 24     | 21     | 19     | 24     | 21     | 23     | 25     | 19     | 17      | 21.0  |
| 22              | 10     | 11     | 16     | 17     | 17     | 15     | 15     | 11     | 13     | 15      | 14.0  |
| 23              | 3      | 5      | 8      | 4      | 4      | 6      | 9      | 7      | 6      | 5       | 5.7   |
| 24              | 12     | 16     | 20     | 16     | 13     | 18     | 19     | 15     | 18     | 15      | 16.2  |
| 25              | 17     | 19     | 27     | 21     | 19     | 24     | 25     | 21     | 21     | 25      | 21.9  |
| 26              | 10     | 12     | 12     | 10     | 14     | 14     | 10     | 9      | 5      | 6       | 10.2  |
| 35              | 15     | 13     | 14     | 14     | 19     | 17     | 13     | 15     | 14     | 18      | 15.2  |
| 39              | 6      | 7      | 11     | 10     | 10     | 11     | 7      | 11     | 16     | 11      | 10.0  |
| Total           | 193    | 233    | 269    | 253    | 269    | 277    | 263    | 252    | 252    | 236     | 249.7 |

Information about adolescents' place of residence during each wave was provided to Pathways to Desistance Study personnel. In order to maintain subject anonymity, it was not possible to gain additional information with regard to where within a district an individual resided. As such, it is possible that some individuals lived near the border of two police districts, one receiving the infusion of officers and one a control. Additionally, it is also possible that despite listing a particular address as one's legal residence, some serious adolescent offenders actually spent a large portion of their time elsewhere. These limitations regarding the specific nature of Pathways to Desistance participants' living situations should be considered when interpreting results.

#### Philadelphia Police Department Data

Official law enforcement and administrative data were obtained from the Philadelphia Police Department (PPD) through a cooperative agreement.<sup>37</sup> These data were used to assess the relative strength of police districts across time, and to evaluate the impact of the 2008 Crime Fighting Strategy. Three PPD datasets spanning the years 2006 through 2010 were used in this research: number of officers by rank/unit, crimes reported, and arrests. All measures in the three datasets were captured for each of the 60 months during the 2006 through 2010 time period, and recorded at the police district level. As such, differences in police district strength, crime, and arrests can be analyzed in relation to individual perceptions and district level perceptions at various points in time; variables relevant to target districts from the PPD Crime

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<sup>37</sup> The Department provided administrative data with the stipulations that findings will be shared with the Deputy Commissioner prior to publication, and that raw data regarding the resources in specific districts would not be shared publicly.

Fighting Strategy—such as the change in sworn officer strength—were identified before and after the policy change.

The officer data include the number and rank of sworn and nonsworn police personnel across all police districts and specialized bureaus. Specialized bureaus include: major investigations (e.g. crime scene unit, document examination unit, criminalistics lab), special investigations (e.g. homicide, citywide vice, major crimes), narcotics, communications, information technology, training and education services, administrative services, and support services. The mean number of sworn PPD officers assigned to a police district (rather than a specialized unit, or other non-district placement) during the 60 month observation period was 3,781.5 (*s.d.*=155.61; *min*=3,501; *max*=4,075), which included an average of 3,335.33 patrolmen (*s.d.*=155.31; *min*=3,058; *max*=3,611); additionally, an average of 111.45 civilians were employed during the observation period (*s.d.*=10.03; *min*=98; *max*=133).

The crimes reported and arrest data provided by PPD were coded according to Philadelphia Incident Classification Codes. The databases include misdemeanors, felonies, and some traffic offenses and disorder; Part I and Part II Uniform Crime Report incidents can be easily identified within these databases. During the observation period of 2006 through 2010, 7,827,711 criminal incidents were reported, and 388,827 arrests were made. Over the five year period there were 2,246 reported incidents of homicide, 4,944 reported rapes, 47,650 robberies, 47,208 aggravated assaults, 57,062 burglaries, and 196,285 reported thefts. Within the Philadelphia Incident Classification Code for each crime, additional details such as weapon and location are accounted for. Importantly, while crimes reported and arrest data are

available, reliable clearance rates cannot be calculated from month-to-month, given that in many instances there is likely a lag between time reported and time of arrest.

#### Census 2000

Data from the 22<sup>nd</sup> decennial census, Census 2000, were also utilized in order to account for social and structural differences between police districts. Census 2000 counted 281,421,906 people in the fifty states and the District of Columbia, and had a 67 percent response rate (U.S. Census Bureau 2002). The “short form” questionnaire was asked of every person and housing unit in the United States and contained seven questions: name, sex, age, household relationship, Hispanic/Latino origin, race, and tenure (whether the housing unit is owned or rented). Additionally, approximately 17 percent of households received a “long form” questionnaire that included questions regarding the population (social and economic characteristics) and housing units (physical and financial characteristics; U.S. Census Bureau 2002). Census 2000 data were mapped to Philadelphia Police Districts by the Cartographic Modeling Laboratory (CML) at the University of Pennsylvania, and made available for public download.<sup>38</sup>

#### Variables

##### Outcomes of Interest

Police procedural justice is captured in two constructs within the Pathways to Desistance data, each measured at baseline and follow-up interviews (see Appendices

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<sup>38</sup> The CML is a research unit within the Biostatistics Analysis Center (BAC) of the Perelman School of Medicine's Center for Clinical Epidemiology and Biostatistics (CCEB). Census data mapped to police districts are available for download from the University of Pennsylvania (Version 2005.12): <http://nis.cml.upenn.edu/crimebase/cbsRawDataRequest.asp>

B and C for full construct measures). The variables included in the Pathways data were adapted from those developed by Tyler (1997), and were intended to capture dimensions associated with fair treatment, such as correctability, ethicality, representativeness, and consistency (Mulvey 2013; Tyler and Huo 2002). These variables, Police Procedural Justice: Personal Experiences (PJPE) and Police Procedural Justice: Vicarious Experience (PJVE), were coded as five point Likert scales. Both procedural justice variables from the Pathways to Desistance data have been employed in numerous studies, (Augustyn 2015, 2016; Lee et al. 2010; Lee et al. 2011; Piquero et al. 2005; Sweeten et al. 2013).

Police Procedural Justice: Personal Experiences (PJPE) measures individuals' direct experience with police as a mean of fourteen items (for a full list of questions, see Appendix B). These measures are in the form of statements such as "during my last encounter with the police, they treated me in a way that I expected they would treat me," and "the police treat me the same way they treat most people my age" with five-point Likert scales (i.e. 1 = "strongly disagree", 5 = "strongly agree"). Additionally some questions had fewer than five possible responses (e.g. "Think back to the last time the police accused you of doing something wrong. Did the police treat you with respect and dignity or did they disrespect you? (1) Respect/Dignity, (2) Neutral Treatment, (3) Disrespect"); these responses were converted to a five point Likert scale. The mean score for PJPE was 3.21 (n=6,028; s.d.=0.75) for all Philadelphia participants' observations across waves one through ten, and 3.17

(n=2,466; s.d.=0.75) for the geocoded subsample's observations across waves one through ten.<sup>39</sup>

Similarly, Police Procedural Justice: Vicarious Experience (PJVE) measures individuals' perceptions of others' experiences using a five point Likert scale (for a full list of questions, see Appendix C). However, this construct is a mean of only five items, which were more abstract than those based on one's own experience. For example, measures from the PJVE index include "police treat people differently depending on how old they are", and "police treat males and females differently". As with PJPE, any measures with fewer than five possible responses were converted to a five point scale. The mean score for the PJVE measure was 2.64 (n=6,088; s.d.=0.71) for all Philadelphia participants' observations across waves one through ten, and 2.67 (n=2,495; s.d.=0.73) for the geocoded subsample's observations across waves one through ten.

#### Independent Variables

**Police District of Residence.** The police district in which an individual resides is captured in the Pathways to Desistance data at each wave (Figure 3.2; Table 3.3). This variable is not time stable, and captures if study participants relocate from one police district to another in between waves. Police districts were compared for each individual for sequential interview waves in the dataset (e.g. wave 1 to 2, wave 2 to

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<sup>39</sup> Note that the means for the procedural justice measures presented here are different from Table 1, which contains means recorded at *baseline* for the full sample, and sub-samples for waves 1 through 10. The means presented here are the average of all observations captured during waves 1 through 10. Additionally, the N's here are much higher than the sample and sub-sample size, as the descriptive statistics aggregate observations across all ten waves. The highest possible N would then be 7,000, however it is slightly smaller due to individuals missing interview waves or individual questions for a variety of reasons.

3). In 177 instances individuals changed which police district they resided in between an interview wave and the one that immediately followed ( $\bar{x} = 19.67$  movers per wave; Table 3.4).<sup>40</sup> There was a total of 1,517 individuals who remained in the same police district for two sequential waves ( $\bar{x} = 168.56$  non-movers per wave). Importantly, before those who moved during a two-wave period (e.g. between waves one and two) relocated, they were statistically similar to those who did not move during between those waves with regard to all three procedural justice measures (as measured pre-move—wave one in this example).

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<sup>40</sup> Thus, to be included in this particular sub-sample, individuals needed to complete at least two sequential interview waves. This was done so that the time of moving could be more precisely estimated than if there was a gap of missed waves in between when then police district of residence changed.

Table 3.4. Procedural Justice Measures for Individuals Who Did and Did Not Relocate to a Different Police District in between Waves

|               |                               | Movers         | Non-Movers     | Total          |
|---------------|-------------------------------|----------------|----------------|----------------|
| Waves 1 to 2  | n                             | 13             | 130            | 143            |
|               | Personal Experience (wave 1)  | 3.00<br>(0.81) | 3.12<br>(0.74) | 3.11<br>(0.75) |
|               | n                             | 13             | 131            | 144            |
|               | Vicarious Experience (wave 1) | 3.08<br>(0.80) | 2.68<br>(0.69) | 2.72<br>(0.71) |
| Waves 2 to 3  | n                             | 14             | 167            | 181            |
|               | Personal Experience (wave 2)  | 3.15<br>(0.64) | 3.08<br>(0.76) | 3.09<br>(0.76) |
|               | n                             | 14             | 169            | 183            |
|               | Vicarious Experience (wave 2) | 2.79<br>(0.61) | 2.63<br>(0.74) | 2.64<br>(0.73) |
| Waves 3 to 4  | n                             | 12             | 180            | 192            |
|               | Personal Experience (wave 3)  | 3.38<br>(0.85) | 3.17<br>(0.75) | 3.18<br>(0.75) |
|               | n                             | 12             | 185            | 197            |
|               | Vicarious Experience (wave 3) | 2.77<br>(0.89) | 2.65<br>(0.71) | 2.66<br>(0.72) |
| Waves 4 to 5  | n                             | 14             | 182            | 196            |
|               | Personal Experience (wave 4)  | 3.17<br>(0.69) | 3.22<br>(0.76) | 3.21<br>(0.75) |
|               | n                             | 14             | 186            | 200            |
|               | Vicarious Experience (wave 4) | 2.75<br>(0.61) | 2.72<br>(0.71) | 2.72<br>(0.70) |
| Waves 5 to 6  | n                             | 17             | 193            | 210            |
|               | Personal Experience (wave 5)  | 3.45<br>(0.73) | 3.23<br>(0.78) | 3.24<br>(0.78) |
|               | n                             | 18             | 194            | 212            |
|               | Vicarious Experience (wave 5) | 2.60<br>(0.76) | 2.78<br>(0.77) | 2.76<br>(0.77) |
| Waves 6 to 7  | n                             | 24             | 176            | 200            |
|               | Personal Experience (wave 6)  | 3.39<br>(0.89) | 3.16<br>(0.74) | 3.19<br>(0.76) |
|               | n                             | 24             | 179            | 203            |
|               | Vicarious Experience (wave 6) | 2.61<br>(0.77) | 2.72<br>(0.83) | 2.71<br>(0.82) |
| Waves 7 to 8  | n                             | 29             | 161            | 190            |
|               | Personal Experience (wave 7)  | 3.28<br>(0.73) | 3.18<br>(0.75) | 3.20<br>(0.75) |
|               | n                             | 29             | 162            | 191            |
|               | Vicarious Experience (wave 7) | 2.83<br>(0.68) | 2.64<br>(0.79) | 2.67<br>(0.78) |
| Waves 8 to 9  | n                             | 33             | 153            | 186            |
|               | Personal Experience (wave 8)  | 3.11<br>(0.78) | 3.27<br>(0.74) | 3.24<br>(0.75) |
|               | n                             | 33             | 153            | 186            |
|               | Vicarious Experience (wave 8) | 2.82<br>(0.80) | 2.61<br>(0.71) | 2.65<br>(0.73) |
| Waves 9 to 10 | n                             | 19             | 157            | 176            |
|               | Personal Experience (wave 9)  | 3.43<br>(0.66) | 3.28<br>(0.74) | 3.30<br>(0.73) |
|               | n                             | 20             | 158            | 178            |
|               | Vicarious Experience (wave 9) | 2.65<br>(0.71) | 2.57<br>(0.71) | 2.58<br>(0.71) |



Police district delineation was relatively stable over the time period studied, though some districts were either dissolved or combined as a part of the “Crime Fighting Strategy”. Specifically, the 92<sup>nd</sup> District, which exclusively covered Fairmount Park was disbanded in December 2008 and officers were distributed amongst the surrounding districts. Additionally, the 22<sup>nd</sup> and 23<sup>rd</sup> districts in North Philadelphia merged in January 2010, and the 3<sup>rd</sup> and 4<sup>th</sup> Districts in the South Police Division were merged in March 2010. These mergers were a part of Commissioner Charles Ramsey’s plan to reduce the total number of police districts in the city (Gambacorta 2009).

Officer Strength. The number of police officers per police district is recorded for each month from January 2006 through December 2010. Officer strength was not time stable, as police districts were merged, and the Crime Fighting Strategy was undertaken to redeploy more sworn officers to high crime areas. The average number of sworn personnel per police district was 166.83 (s.d.=40.68), with the minimum of 106, and a maximum of 311 (after two smaller districts merged). Population information from the Census 2000 and spatial information from a Philadelphia Police District GIS shapefile allow for total number of sworn personnel per 100,000 population and per square mile to be calculated for each police district at each individual time point.<sup>41</sup>

Police Contact. The Pathways to Desistance Study includes two measures estimating the adolescents’ contact with law enforcement. Picked up by Police (y/n)

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<sup>41</sup> While the rate of sworn officers per 100,000 population can be calculated for each time period, it must be noted that the population information (i.e. denominator) is not updated, as it is based on 2000 Census information; only the officer strength is updated for each month of the 2006-2010 time period.

is a binary measure in which the adolescents report whether or not police picked them up and accused them of something during the recall period. The mean score for this binary variable was 0.27 (n=6,088; s.d.=0.42) for all Philadelphia participants' observations across waves one through ten, and 0.27 (n=2,495; s.d.=0.44) for the geocoded subsample's observations across waves one through ten. Picked up by Police (number) follows up to the binary question, and asks those who reported having been picked up and accused of something during the recall period how many times it occurred. Responses to this question ranged from 1 to 20 for the full Philadelphia sample and the sub-sample. Of those who reported contact with the police, the mean number of times they reported being picked up was 1.27 (n=1,381; s.d.=0.84) for all Philadelphia participants across waves one through ten, and 1.26 (n=678; s.d.=0.94) for the geocoded subsample across waves one through ten.

#### Control Variables

Neighborhood Conditions. Neighborhood conditions, as reported by Pathways to Desistance subjects, were recorded at baseline and during each follow-up wave. This was adapted from Sampson and Raudenbush (1999) as a self-report measure to assess the area surrounding the adolescent's home. This construct included measures of neighborhood social disorder, physical disorder, and perceived safety. Social Disorder is a summary measure of nine items that reports the frequency with which the adolescents see social disorder in their neighborhood; examples of social disorder reported include "adults fighting or arguing loudly" and "people using needles or syringes to take drugs". This measure uses a four point Likert scale, with "often" being scored as 4 on the scale. The mean score for this Social Disorder variable was

2.64 (n=4,714; s.d.=0.77) for all Philadelphia participants' observations across waves one through ten, and 2.67 (n=2,491; s.d.=0.74) for the geocoded subsample's observations across waves one through ten. Physical Disorder is a summary measure of twelve items that reports the frequency with which the adolescents observe physical disorder, also using a four point Likert scale. Examples of physical disorder reported include "cigarettes on the street or in the gutters" and "graffiti or tags". The mean score for this Physical Disorder variable was 2.68 (n=4,715; s.d.=0.76) for all Philadelphia participants' observations across waves one through ten, and 2.72 (n=2,492; s.d.=0.72) for the geocoded subsample's observations across waves one through ten.

Neighborhood Safety is a summary measure of seven items on a five point Likert scale. Unlike the disorder measures, a higher score on this scale reflected "feels safe all of the time" or "in danger none of the time". The mean score for this Neighborhood Safety variable was 1.29 (n=4,403; s.d.=0.57) for all Philadelphia participants' observations across waves one through ten, and 1.29 (n=2,323; s.d.=0.58) for the geocoded subsample's observations across waves one through ten.

Exposure to Violence. Individuals' exposure to violence (ETV), both as a victim and a witness, are recorded for each wave in the Pathways to Desistance data. The ETV Inventory developed by Selner-O'Hagan et al. (1998) was modified for the Pathways study to capture the frequency of exposure to violent events. The modified ETV captures the frequency of being a witness or being a victim to different violent acts such as: sexual attacks, attacks with weapons, fights, and suicides. Exposure to Violence: Victim is a summary count of six items where the subject was

a victim. Examples of questions include “have you been chased where you thought you might be seriously hurt in the past N months?” The mean score for this Victim variable was 0.17 (n=6,085; s.d.=0.55) for all Philadelphia participants’ observations across waves one through ten, and 0.20 (n=2,493; s.d.=0.60) for the geocoded subsample’s observations across waves one through ten. Exposure to Violence: Witness is a summary count of seven items where the subject was a witness. Examples of questions include “have you seen someone else being raped, an attempt made to rape someone, or any other type of sexual attack in the past N months?” The mean score for this Witness variable was 1.14 (n=6,085; s.d.=1.54) for all Philadelphia participants’ observations across waves one through ten, and 1.16 (n=2,493; s.d.=1.61) for the geocoded subsample’s observations across waves one through ten.

Street Time. The proportion of Pathways to Desistance participants’ time spent in the community is reported for each wave. This measure accounts for individuals’ opportunity to engage in criminal or delinquent activity, and includes time spent on probation as time in the community. The mean score for the Street Time variable was 0.65 (n=6,094; s.d.=0.42) for all Philadelphia participants across waves one through ten, and 0.84 (n=2,496; s.d.=0.27) for the geocoded subsample across waves one through ten.

Crime. The Philadelphia Police Department provided crime reported and arrest data for the 2006 through 2010 time frame. These variables were recorded using FBI Uniform Crime Report detailed descriptions for Part I and Part II offenses. While both crimes reported and arrests are available for each month, these cannot be

combined to calculate a clearance rate, as it is possible that crimes and corresponding arrests occur in two different months. In this analysis, crimes were divided into four categories: all Part I crimes, Part I violent crimes, Part I property crimes, and vice and disorder crimes. The vice and disorder category included vandalism/ criminal mischief, prostitution/commercialized vice, other sex offenses (not included in Part I crimes), drug and liquor law violations, weapons offenses, gambling violations, public drunkenness, disorderly conduct, and vagrancy.

Social Structure Variables. This dissertation will account for police district level variation in serious adolescent offenders' perceptions of procedural justice while considering police district level characteristics. The social and structural characteristics of the police districts assessed were measured and recorded during Census 2000 (Table 3.5). These data include the population ( $\bar{x}$ =65,965.57 per district, s.d.=29,522.30), median income ( $\bar{x}$ =\$28,164.86 per district, s.d.=7,999.88), average education ( $\bar{x}$ =10.45% of each district have B.A. degrees, s.d.=6.84;  $\bar{x}$ =31.97% of each district have H.S. diplomas, s.d.=7.19).<sup>42</sup> The percent adult ( $\bar{x}$ =75.49% of each district, s.d.=6.89) and racial makeup ( $\bar{x}_{\text{black}}$ =43.36%, s.d.=32.39;  $\bar{x}_{\text{Asian}}$ =4.85%, s.d.=3.49;  $\bar{x}_{\text{Hispanic}}$ =8.16%, s.d.=12.63;  $\bar{x}_{\text{other}}$ =4.55%, s.d.=8.21) are also captured in the census for each police district. As demonstrated in Table 3.5 and the standard deviations listed above, there is wide variance in the social, economic, and demographic makeup of Philadelphia's police districts. For example, there is a particularly striking contrast between the 5<sup>th</sup> District, in which the median household

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<sup>42</sup> The 92<sup>nd</sup> police district, which covered only Fairmount Park, was excluded from the mean and standard deviation calculations for population and households because it is an extreme outlier. The population of the 92<sup>nd</sup> district in 2000 was 342, with a total of 148 households. None of the adolescents in the Pathways to Desistance sample reported living in this district at any point during the study.

income is \$42,856.50, 82 percent of the population is adults, and 20 percent have B.A. degrees, relative to the 22<sup>nd</sup> District, in which the median income is \$14,999.10, less than 70 percent are adults, and fewer than three percent hold B.A.s. This high level of variation suggests that these social and structural factors should be considered and accounted for when assessing other inter-district trends.

Table 3.5: 2000 Census Data by Police District

| Police District | Total Population | Adult (%) | Children (%) | Total Households | Income (Median) | African American (%) | Asian (%) | Hispanic (%) | Other (%) | Education: BA (%) | Education: HS (%) |
|-----------------|------------------|-----------|--------------|------------------|-----------------|----------------------|-----------|--------------|-----------|-------------------|-------------------|
| 1               | 34,970           | 76.36     | 23.64        | 14,219           | \$ 27,976.50    | 27.80                | 7.24      | 1.94         | 0.73      | 7.74              | 36.69             |
| 2               | 98,334           | 74.65     | 25.35        | 38,285           | \$ 35,420.00    | 10.56                | 7.07      | 9.38         | 4.71      | 10.16             | 38.13             |
| 3               | 31,257           | 83.77     | 16.23        | 14,984           | \$ 31,384.70    | 17.40                | 12.39     | 5.00         | 1.74      | 20.58             | 22.77             |
| 4               | 48,573           | 76.39     | 23.61        | 19,157           | \$ 26,558.90    | 10.71                | 10.75     | 4.81         | 1.90      | 5.58              | 37.83             |
| 5               | 41,574           | 82.13     | 17.87        | 18,357           | \$ 42,856.50    | 6.13                 | 2.32      | 1.77         | 0.50      | 20.14             | 29.56             |
| 6               | 28,380           | 90.52     | 9.48         | 15,445           | \$ 32,082.40    | 23.54                | 11.31     | 4.31         | 1.65      | 25.03             | 13.90             |
| 7               | 84,343           | 81.03     | 18.97        | 35,025           | \$ 38,671.20    | 3.42                 | 6.68      | 3.33         | 1.23      | 15.64             | 34.90             |
| 8               | 98,050           | 79.22     | 20.78        | 37,235           | \$ 41,949.70    | 10.02                | 2.68      | 3.92         | 1.66      | 9.74              | 41.21             |
| 9               | 45,357           | 91.26     | 8.74         | 27,336           | \$ 37,909.60    | 14.98                | 6.29      | 5.49         | 2.42      | 27.84             | 12.76             |
| 12              | 75,386           | 68.35     | 31.65        | 26,940           | \$ 25,796.20    | 73.58                | 4.53      | 1.69         | 0.62      | 5.35              | 37.84             |
| 14              | 119,181          | 75.07     | 24.93        | 47,132           | \$ 36,591.20    | 79.91                | 0.62      | 1.46         | 0.58      | 13.44             | 29.30             |
| 15              | 125,344          | 73.46     | 26.54        | 47,314           | \$ 32,364.50    | 13.57                | 1.62      | 7.26         | 3.84      | 7.35              | 41.81             |
| 16              | 38,036           | 73.81     | 26.19        | 14,095           | \$ 15,937.70    | 81.51                | 2.74      | 1.75         | 0.62      | 7.18              | 33.66             |
| 17              | 45,444           | 71.75     | 28.25        | 18,139           | \$ 21,333.50    | 73.11                | 5.49      | 2.13         | 0.90      | 7.38              | 32.49             |
| 18              | 78,914           | 80.16     | 19.84        | 29,426           | \$ 22,803.50    | 68.98                | 7.57      | 2.27         | 0.93      | 9.97              | 30.67             |
| 19              | 92,494           | 74.84     | 25.16        | 36,849           | \$ 27,386.90    | 77.83                | 1.90      | 1.69         | 0.58      | 10.96             | 30.44             |
| 22              | 45,103           | 69.27     | 30.73        | 15,783           | \$ 14,999.10    | 94.24                | 0.71      | 1.47         | 0.64      | 2.73              | 33.32             |
| 23              | 25,224           | 71.86     | 28.14        | 9,004            | \$ 17,623.80    | 91.10                | 0.90      | 2.14         | 0.80      | 5.37              | 30.88             |
| 24              | 64,342           | 67.59     | 32.41        | 22,798           | \$ 22,173.00    | 12.20                | 2.57      | 27.89        | 18.00     | 3.24              | 38.67             |
| 25              | 74,375           | 62.49     | 37.51        | 22,363           | \$ 17,777.60    | 34.56                | 3.26      | 55.13        | 34.93     | 2.47              | 30.36             |
| 26              | 48,947           | 68.62     | 31.38        | 16,885           | \$ 20,270.40    | 21.85                | 2.96      | 31.51        | 19.87     | 4.83              | 31.38             |
| 35              | 107,843          | 70.11     | 29.89        | 36,833           | \$ 30,109.50    | 69.74                | 8.68      | 9.39         | 5.05      | 7.86              | 35.89             |
| 39              | 6,5737           | 73.62     | 26.38        | 26,319           | \$ 24,143.60    | 80.48                | 1.35      | 1.85         | 0.80      | 9.76              | 30.85             |
| 92              | 342              | 78.07     | 21.93        | 148              | \$ 31,836.70    | 40.94                | 0.58      | 2.34         | 1.46      | 17.16             | 31.51             |

## Chapter 4: Analytic Plan

Numerous analytical methods are employed to address the research questions laid out in Chapter 1. The overarching goal of these analyses is to better understand how changes to the police landscape relate to serious adolescent offenders' perceptions of procedural justice at the individual and aggregate police district levels. This research explores the relationship between police deployments and perceptions using the panel, census, and official police data described in Chapter 3. The proposed analytic plan for evaluating each research question and sub-question is outlined below.

*RQ1. Do serious adolescent offenders' perceptions of procedural justice vary across police districts?*

The first research question lays the foundation for the subsequent analyses in this dissertation; the results will indicate if we can expect district level heterogeneity in police presence and social-structural characteristics (explored in RQ 1a and 1b) to be associated with different perceptions of procedural justice, when measured by individual and by police district. Further, as many police deployment decisions are made at the district level, it follows that we would want to know if the perceptions of the offending public vary at this same level. Analysis of this question employs both police procedural justice variables contained in the Pathways to Desistance data. These police procedural justice measures, described in detail in Chapter 3, are Personal Experience (PJPE) and Vicarious Experience (PJVE).



A one-way Analysis of Variance (ANOVA) will be conducted to test the null hypothesis that the adolescents' mean perceptions of procedural justice are not different across police districts. ANOVAs will be conducted for both procedural justice measures using the geocoded sub-sample for data collected prior to January 2008, when the Philadelphia Crime Fighting Strategy was made public. It is expected that perceptions based on perceptions of procedural justice will vary significantly across police districts, with the PJVE result being more robust than PJPE. As described in Chapter 2, when offenders have more contacts with law enforcement their perceptions of procedural justice are typically lower. It is thus expected that perceptions will vary across districts, as the likelihood of police contact is not uniform across Philadelphia. Further, a larger result is expected for PJVE, as the degree to which one may observe or otherwise learn about others' experiences with law enforcement is likely to vary geographically to a greater extent than the quality of one's personal experiences.

1a. Is there a relationship between the relative strength of the police and district level perceptions of police procedural justice?

This dissertation is particularly interested in how macro-level police actions and policies are related to perceptions of procedural justice. The relationship between the number of police officers and perceptions of procedural justice will first be explored descriptively. Each of these relationships will be assessed twice—once using individual observations, and once with observations aggregated to the district level. By first assessing correlations using individual observations, the degree to which the two variables are associated should be made clear. However, since most interactions between police and the community are driven by geography, it is useful

to know if the variables explored here are similarly correlated when aggregated according to police district, and help to clarify trends.<sup>43</sup> Officer strength will be studied both as a measure of officers per 1,000 residents, and of officers per square mile for each police district. Importantly, this analysis will utilize observations prior to 2008, in order to avoid a confounding treatment effect for districts that received an infusion of additional officers through the 2008 Crime Fighting Strategy.

First, scatterplots and non-parametric regression will be generated to depict the relationships between officer strength measures and perceptions of procedural justice. The non-parametric line will be fitted using locally weighted scatterplot smoothing (lowess); better than a linear regression, the lowess plot should help identify trends within noisy data and call attention to potentially influential outliers. Again, each of these will be produced twice—once using individual observation data and once with aggregate data. Correlation coefficients will be calculated to estimate the association between officer strength and procedural justice measures at the individual and aggregate levels across police districts.<sup>44</sup> Correlations will be estimated using both the parametric Pearson's product-moment correlation (Pearson's  $r$ ) and non-parametric Spearman's rank correlation coefficient (Spearman's  $\rho$ ). Pearson's  $r$  will be utilized to estimate the strength of the relationship between the two variables, while assuming it is linear; Spearman's  $\rho$  will also estimate the

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<sup>43</sup> Additionally, by reducing the number of observations to 23, and thus reducing the statistical power, this level of analysis will provide more conservative estimates of effects relative to the individual level analyses.

<sup>44</sup> Officer strength measures at the aggregate level will be a mean of the number of officers in each particular district between 2006 and 2008. Officer strength measures at the individual level will reflect the number of officers in the individual's district of residence during the month that their interview occurred.

strength of the relationship, with the added benefit of being less sensitive to the influence of outlier observations and nonlinearity.

1b. Are social, demographic, or economic conditions associated with adolescents' perceptions of procedural justice?

It is also possible that variance in perceptions of procedural justice across police districts is associated with socio-economic or demographic heterogeneity. As such, in addition to determining if there is significant variation in individual perceptions across police districts, the relationship between social structure and district level perceptions will be explored. Similar to RQ 1a, correlation coefficients and scatterplot graphs will be employed to pair aggregate and individual perception data with census and Uniform Crime Report data. This series of correlations will provide insight into the relationship between perceptual measures and socio-economic variables such as: median income, average education, percent adult, racial makeup, violent crime rate, property crime rate and vice and disorder crime rate. As in 1 and 1a, this analysis will utilize observations prior to 2008, in order to avoid tainting relationship estimates with a 2008 Crime Fighting Strategy treatment effect.

*RQ2. Does a change in local policy or police resources impact perceptions of police procedural justice?*

As stated earlier, this assessment will be conducted both at the level of service delivery (i.e. the police district), as well as at the individual level. The aggregate analysis (RQ 2a) will evaluate the effect of the policy at the level of aggregate target and control districts to test whether it made a difference in aggregate perceptions of procedural justice in treated areas; conversely, the individual analysis (2b) is concerned with within-person change as a function of the policy. Two powerful

estimation strategies—difference-in-differences and fixed effects estimation—will be used to assess the policy impact at the aggregate and individual levels, respectively.

2a. Does the influx of additional officers affect perceptions of procedural justice between individuals in target and control districts?

At the aggregate level, perceptions of procedural justice will be compared for police districts that received an infusion of additional officers in early 2008 (i.e. target districts) to those that did not, before and after the strategy was implemented. This analysis will utilize difference-in-differences estimation, which involves observing outcomes for two groups at two time periods. In a standard difference-in-differences analysis, one group is exposed to a treatment in the second period (i.e. the Crime Fighting Strategy after 2008), and the second group is not. To assess the impact of the treatment, the average gain by the control group is subtracted from the average gain in the treatment group, in order to remove biases between the two groups both at baseline, and over time (Card and Kruger 1994; Wooldredge 2007). Difference-in-differences estimation is a common method of evaluating causality in experimental and quasi-experimental scenarios; it has previously been applied to policing research, measuring the crime-reduction effects of increased police during high terror alert periods (Klick and Tabarrok 2005), and assessing the impact of a street crime initiative on crime outcomes in the United Kingdom (Machin and Marie 2005, 2011).

To estimate the difference-in-differences, both the treatment (a district receiving more officers through the 2008 Crime Fighting Strategy) and time (pre- and post-2008) variables are treated as dummies, and interacted with one another:

$$DistrictPJPerceptions = \beta_0 + \beta_1 Treatment + \delta_0 Period + \delta_1 Treatment * Period + u$$

A statistically significant interaction term would suggest that the policy had a causal effect on aggregate perceptions of procedural justice in the target districts.

Importantly, the data to be utilized for this analysis are amenable to the Parallel Path Assumption, which asserts that if the treatment did not occur, the average change in procedural justice perceptions in the target districts would be equal to the average change in the non-target districts. Angrist and Kruger (2009:1299) suggest that trends in the two groups should be compared both before and after the intervention or event of interest (i.e. the implementation of the 2008 Crime Fighting Strategy). In the case of the present research, the event of interest was not a discrete event, but was instead initiated in January 2008, with the infusion of officers to target districts in place by May 2008. As depicted in Figure 4.1, these data meet the Parallel Path Assumption necessary for a difference-in-differences analysis; the treatment and control groups trend in similar directions across time points prior to the intervention for both procedural justice measures.<sup>45</sup>

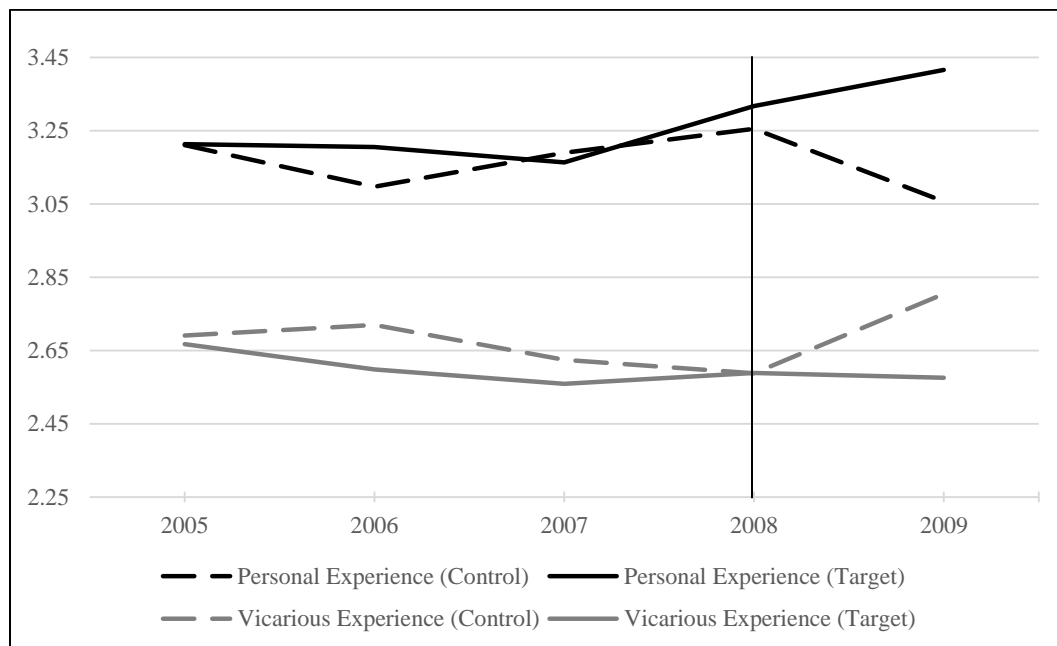
With this central assumption met, the effect of the Crime Fighting Strategy on district level perceptions of procedural justice may be cleanly identified. As stated earlier, it is likely that the treatment negatively affected perceptions of procedural justice, having a greater impact on perceptions based on vicarious experiences than perception based on personal experiences. This hypothesis is based on the notion that the presence of more officers and resources provide more opportunities to witness or

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<sup>45</sup> The nature of the intervention being tested here is such that it is unlikely to be influenced by “Ashenfelter’s Dip”, or the phenomena of the dependent variable increasing/decreasing in anticipation of the treatment (Ashenfelter 1978). The treatment was assigned to areas with disproportionately high violent crime; as such, there is unlikely that perceptions of police procedural justice would dip in anticipation of the treatment. Additionally, no visible dip appears in the data.

learn about others' contact with police, and are less likely to affect judgments about one's own treatment by police. By utilizing difference-in-differences estimation, it is possible to see if this treatment impacted perceptions at the district level, and if the magnitude of this impact was greater for PJVE than PJPE.

Figure 4.1: Perceptions of Police Procedural Justice



2b. Are individual- level perceptions affected by district level police staffing changes?

At the individual level, perceptions of procedural justice will be compared for Pathways to Desistence adolescent offenders that lived in districts targeted by the Crime Fighting Strategy to those that did not, for whom measures are available both before and after the strategy was implemented. To eliminate bias due to fixed, unobserved heterogeneity, a fixed effects model is utilized. Fixed effects estimation accounts for time-stable unobserved heterogeneity correlated with perceptions of procedural justice, and provides a more powerful estimation than a simple difference-

in-differences analysis. Whereas the difference-in-differences analysis pools data into aggregate treatment and control groups before and after treatment, the fixed effects estimation analyzes individual changes over time. For example, observations may be recorded at two or more points in time:

$$\text{Individuals at T1: } PJPerceptions_{i1} = \beta_1 + \beta_2 Treatment_{1i} + \alpha_i + \varepsilon_{1i}$$

$$\text{Individuals at T2: } PJPerceptions_{i2} = \beta_1 + \beta_2 Treatment_{2i} + \alpha_i + \varepsilon_{2i}$$

Subtracting the first fixed effects model from the second (i.e. pre-treatment from post) yields:

$$\text{Individuals at T2-T1: } \Delta PJPerceptions_i = \Delta\beta_1 + \beta_2 \Delta Treatment_i + \Delta\varepsilon_i$$

Estimating individual level change this way provides a more reliable approximation of changes to individuals' perceptions of procedural justice, while accounting for observable and fixed unobservable heterogeneity. Whereas the difference-in-differences analysis will help determine if being in a target district had a significant effect on perceptions of procedural justice, relative to being in a control district, this approach will estimate the change experienced by an individual after the treatment, compared to before. Importantly, this estimation relies on the assumption that no other factors are affecting perceptions of procedural justice between the pre- and post-treatment periods; failing to meet this assumption would produce omitted variable bias and imprecise estimations. Personal communication with the Philadelphia Police Department's Deputy Commissioner confirmed that the PPD was not engaging in any procedural justice oriented programming or initiatives during the time period being observed.

The same outcome is expected for the fixed effects estimation as the difference-in-differences analysis: it is likely that receiving the treatment negatively affects individuals' perceptions of procedural justice, having a stronger influence on PJVE than PJPE.

*RQ3: Do perceptions of police procedural justice and legitimacy change as individuals relocate across police districts?*

The third research question being addressed in this dissertation explores the nature of perceptions of police procedural justice over time and space. Exploiting the geocoded panel data available, this line of inquiry attempts to identify elements of effective procedural justice-oriented policy. For example, if perceptions of procedural justice are demonstrated to be relatively time-stable in certain geographic regions compared to others, legitimacy-related policy implications for these areas would likely differ as well. Similarly, if individuals move from one place to another and update their perceptions to match their new environment, the policy implications could be quite different than if individuals' perceptions were unaffected by relocation.

3a. Are individual perceptions regarding police stable across time and place?

Research has previously demonstrated that adolescent offenders' perceptions of procedural justice are not time stable (e.g. Augustyn 2016), but has yet to determine if these updating mechanisms interact with place characteristics. To test if district level heterogeneity influences ones' changing of perceptions over time, a two-way analysis of variance will be utilized. Unlike the ANOVA employed in RQ1, this analysis will assess both the effect of time, and an interaction between time and district (target or control), to explore the effect that environment might play on within-person changes in perceptions of procedural justice.



3b. Do movers' perceptions change more substantially than the perceptions of individuals who did not move?

This last research question assesses whether the magnitude of change in movers' perceptions is greater than the level of change experienced by those who stayed in one place. Perceptions of procedural justice (PJPE and PJVE) will be compared for individuals who moved between two sequential interview waves, and those who stayed in the same police district between two sequential waves. The level of change will be measured as the absolute value of the difference between the individual's perceptual measures in the two sequential waves; a student's t-test will determine if the differences in PJPE and PJVE experienced by movers are greater than those experienced by non-movers. In order to assess if there is a contextual association with any changes in perceptions, this analysis will also look into the direction of changes in perceptions (i.e. becoming more or less favorable of police) in conjunction with the type of move (i.e. moving from a target district to a control district, from a control district to a target district, or remaining in the same type of district). Together with 3a the findings from this question can inform conclusions regarding the impact of place on serious adolescent offenders' perceptions of procedural justice.

## Chapter 5: Descriptive Overview of Adolescent Offenders' Perceptions of Procedural Justice and Key Correlates

This chapter answers the first research question addressed in this dissertation: *do serious adolescent offenders' perceptions of procedural justice vary across police districts?* These analyses rely on perceptual and official data captured prior to the implementation of the Philadelphia Police Department's Crime Fighting Strategy in January 2008. It is expected, due to the heterogeneous social, economic, and population makeup of the city of Philadelphia, that perceptions will vary according to police district, with districts with worse socio-economic conditions, higher population density, and a larger law enforcement presence being associated with poorer perceptions of the police. It is believed that this would be due to individuals in more disadvantaged areas personally experiencing more frequent contact with police, and vicariously experiencing more contacts through witnessing peers or neighbors interact with the police. Greater variation is expected in perceptions based on vicarious experiences, as personal experiences are thought to rely more on interpersonal exchanges with police, while vicarious experiences rely on opportunity to witness or learn of others' interactions with police. Opportunities for vicarious experiences are likely to vary much more across districts in relation to difference crime rates, law enforcement presence, and volume of people.

To assess the level of variation in perceptions of procedural justice across districts, separate analysis of variance (ANOVA) estimates were calculated for

procedural justice measures based on personal experiences (PJPE) and based on vicarious experiences (PJVE); these estimates used observations collected from adolescent offenders in the 23 residential police districts (Table 5.1). The variation in adolescents' perceptions of PJPE across police districts was not statistically distinguishable from distribution by chance alone ( $F=0.92$ ,  $p=0.562$ ,  $n=2,151$ ). Conversely, ANOVA estimates of perceptions of PJVE across police districts produced a significant model ( $F=4.15$ ,  $p<0.001$ ,  $n=2,175$ ). Thus, this is consistent with the initial hypothesis that perceptions of procedural justice based on vicarious experiences would vary according to district to a greater extent than perceptions based on personal experiences.

Table 5.1: Procedural Justice Measures by Police District, before 2008

| Police District | Procedural Justice Measure |       |       |                      |       |       |
|-----------------|----------------------------|-------|-------|----------------------|-------|-------|
|                 | Personal Experience        |       |       | Vicarious Experience |       |       |
|                 | n                          | mean  | s.d.  | n                    | mean  | s.d.  |
| 1               | 79                         | 3.047 | 0.655 | 81                   | 2.744 | 0.739 |
| 2               | 30                         | 3.093 | 0.806 | 32                   | 2.162 | 0.789 |
| 3               | 11                         | 2.921 | 0.595 | 11                   | 2.500 | 0.602 |
| 4               | 79                         | 3.137 | 0.729 | 80                   | 2.788 | 0.627 |
| 5               | 17                         | 3.319 | 0.863 | 17                   | 2.338 | 0.682 |
| 6               | 30                         | 3.302 | 0.750 | 30                   | 3.125 | 0.787 |
| 7               | 17                         | 3.145 | 0.861 | 17                   | 3.015 | 0.820 |
| 8               | 42                         | 3.257 | 0.937 | 43                   | 2.207 | 0.575 |
| 9               | 28                         | 3.212 | 0.740 | 28                   | 2.905 | 0.621 |
| 12              | 187                        | 3.196 | 0.648 | 188                  | 2.753 | 0.682 |
| 14              | 156                        | 3.214 | 0.783 | 158                  | 2.459 | 0.665 |
| 15              | 203                        | 3.202 | 0.725 | 204                  | 2.621 | 0.732 |
| 16              | 69                         | 2.961 | 0.690 | 69                   | 2.541 | 0.748 |
| 17              | 115                        | 3.162 | 0.683 | 118                  | 2.817 | 0.798 |
| 18              | 108                        | 3.143 | 0.794 | 110                  | 2.750 | 0.753 |
| 19              | 178                        | 3.099 | 0.734 | 185                  | 2.692 | 0.742 |
| 22              | 120                        | 3.083 | 0.775 | 121                  | 2.652 | 0.761 |
| 23              | 50                         | 3.196 | 0.752 | 50                   | 2.702 | 0.706 |
| 24              | 138                        | 3.119 | 0.702 | 139                  | 2.744 | 0.656 |
| 25              | 187                        | 3.089 | 0.791 | 187                  | 2.704 | 0.668 |
| 26              | 96                         | 3.181 | 0.613 | 96                   | 2.782 | 0.803 |
| 35              | 128                        | 3.271 | 0.821 | 128                  | 2.622 | 0.779 |
| 39              | 83                         | 3.149 | 0.825 | 83                   | 2.606 | 0.683 |

### *Relationship between Police Force Strength and Perceptions of Procedural Justice*

This section addresses Research Question 1a: *is there a relationship between the relative strength of the police and perceptions of police procedural justice?* Measures of police force strength were captured each month during the two years before the Philadelphia Crime Fighting Strategy was implemented (i.e. 2006 and 2007), and in the two years that followed (i.e. 2008 and 2009). Each participant's interview date was identified, and the number of sworn police officers assigned to their district during the month of their interview was recorded. Scatterplots depicting measures of sworn officer strength and procedural justice were generated for perceptions based on personal and vicarious experiences. Each scatterplot was generated twice, depicting both individual observations and aggregate district level observations (see Appendix D for all police related scatterplots). As discussed in Chapter 3, by first assessing correlations using individual observations, the degree to which the two variables are associated should be made clear; as it is also of interest, from a policing perspective, to know if the variables are similarly correlated according to police district, aggregate correlations were also be estimated. Lowess plots accompanying the scatterplots were used to identify the presence of any outliers, or particularly influential observations, that may have been affecting correlation estimates, and determined if post-hoc bounds should be applied to the Pearson and Spearman correlation estimates (Table 5.2).<sup>46</sup>

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<sup>46</sup> In cases where outliers appeared to be an issue, correlations were provided twice—once with, and once without the outliers. Correlations with restricted bounds are denoted in the table.

Table 5.2: Correlation between Procedural Justice Measures and Police Variables at District and Individual Level, before 2008

|  | Police Districts    |                     |    | Individuals           |                       |       | Bound <sup>A</sup> |
|--|---------------------|---------------------|----|-----------------------|-----------------------|-------|--------------------|
|  | Pearson             | Spearman            | n  | Pearson               | Spearman              | n     |                    |
| Total Officers                         |                     |                     |    |                       |                       |       |                    |
| Personal Experience                    | -0.028              | -0.046              | 23 | 0.070                 | 0.067                 | 502   |                    |
| Vicarious Experience                   | 0.066               | 0.006               | 23 | -0.011                | 0.009                 | 503   |                    |
| Officers/Sq. Mile                      |                     |                     |    |                       |                       |       |                    |
| Personal Experience                    | -0.266              | -0.194              | 23 | -0.023                | 0.003                 | 502   |                    |
| Vicarious Experience                   | 0.298               | 0.223               | 23 | 0.030                 | 0.027                 | 503   |                    |
| Officers/1000 Pop.                     |                     |                     |    |                       |                       |       |                    |
| Personal Experience                    | -0.190              | -0.241              | 23 | -0.040                | -0.037                | 502   |                    |
|  | -0.403 <sup>†</sup> | -0.414 <sup>†</sup> | 20 | -0.048                | -0.033                | 477   | (0, 4)             |
| Vicarious Experience                   | 0.413 <sup>†</sup>  | 0.302               | 23 | 0.033                 | 0.029                 | 503   |                    |
|  | 0.411 <sup>†</sup>  | 0.317               | 20 | 0.063                 | 0.046                 | 478   | (0, 4)             |
| Picked up by Police (y/n) <sup>B</sup> |                     |                     |    |                       |                       |       |                    |
| Personal Experience                    | -0.236              | 0.014               | 23 | -0.292 <sup>***</sup> | -0.344 <sup>***</sup> | 1,195 |                    |
| Vicarious Experience                   | 0.225               | 0.088               | 23 | -0.079 <sup>***</sup> | -0.078 <sup>***</sup> | 1,195 |                    |
| Picked up by Police (#)                |                     |                     |    |                       |                       |       |                    |
| Personal Experience                    | -0.233              | -0.159              | 23 | -0.023                | -0.021                | 1,195 |                    |
|  |                     |                     |    | -0.013                | -0.019                | 1,193 | (0, 10)            |
| Vicarious Experience                   | -0.075              | -0.080              | 23 | 0.000                 | -0.047                | 1,195 |                    |
|  |                     |                     |    | -0.029                | -0.049 <sup>†</sup>   | 1,193 | (0, 10)            |

<sup>†</sup>  $p < 0.10$ , \* $p < 0.05$ , \*\* $p < 0.01$ , \*\*\* $p < 0.001$

<sup>A</sup> In cases with notable outliers, correlations were recalculated with post-hoc bounds, excluding extreme cases at the margins. Both unbounded and bounded correlations are reported for these cases.

<sup>B</sup> Parametric correlations for the binary variable “picked up by police (y/n)” were estimated both as Pearson product-moment correlation and point-biserial correlation coefficients. Both estimates and levels of significance were identical.

### Measures of Police Force Strength

Total Officers. The scatterplot and accompanying lowess plot depicting the relationship between the total number of sworn police officers in a district and PJPE revealed no discernable relationship at either the individual or aggregate level. Accordingly, the Pearson and Spearman correlation coefficients were nonsignificant at both levels of measurement. Scatterplots and lowess estimates of the relationship between the total number of sworn police and perceptions of PJVE were similarly lacking a clear trend, and Pearson and Spearman estimates were non-significant at the individual and aggregate levels of measurement.

Officers per Square Mile. The plots illustrating the relationship between the number of sworn officers per square mile in each district and PJPE revealed a slight downward trend when perceptions were aggregated to district level; this relationship appeared flat at the individual level. The Pearson and Spearman correlation coefficients were nonsignificant at both levels of measurement; however, both of the correlations were sizable ( $r=-0.266$ ,  $\rho=-0.194$ ) and negative for the aggregate estimates. Scatterplots and lowess plots of sworn police per square mile and PJVE trended slightly upward when estimated using aggregate means, and were absent a clear trend at the individual level. Similar to the estimates of PJPE, Pearson and Spearman estimates were non-significant but sizable at the individual and aggregate level of measurement for PJVE, but in this case were directionally positive ( $r=0.298$   $\rho=0.223$ ).

Officers per 1,000 Population. The scatterplot and lowess plots depicting the relationship between officers per thousand residents in a district and PJPE revealed the presence of outliers at the upper end of the range of the police measure in the aggregate plot. Similarly, there appeared to be an isolated cluster of observations in the upper range of police per 1,000 residents when individual perceptions were plotted. These outliers were also observed in both the aggregate and individual plots that estimated the PJVE relationship.

As such, each correlation for this variable was estimated twice: once using the entire range of observations and once restricting the observations to less than four sworn officers per 1,000 population. When using the entire range of observations, the Pearson and Spearman correlation coefficients were nonsignificant at the individual

and district levels of measurement for both personal and vicarious experiences, though PJPE and PJVE were again directional opposites. When the bounds were restricted, aggregate measures of PJPE ( $r=-0.403$ ,  $\rho=-0.414$ ) and PJVE ( $r=0.411$ ) were marginally significant at the  $p<0.10$  level.

Picked up by Police. Unlike the previous three police measures, the binary variable indicating whether an individual was picked up by police and accused of something during the time since their last interview comes from the Pathways to Desistance Study. For this particular variable Pearson correlation estimates were recalculated as point biserial correlation coefficients due to the binary nature of the police variable.<sup>47</sup> Scatterplots and lowess plots estimating the relationship between perceptions of PJPE and whether an individual was picked up by police indicated a negative relationship at both the district and individual levels. Estimates of correlations at the district level were not significant, while the Pearson and Spearman estimates at the individual level were both significant at the  $p<0.001$  level ( $r=-0.292$ ,  $\rho=-0.344$ ). At the aggregate level plots of PJVE and being picked up by police were slightly positive; at the individual level this plot was slightly negative. Similar to the estimates of PJPE, correlations at the aggregate level were non-significant, while the individual level correlations were negative and significant at the  $p<0.001$  level; the PJVE correlations were much less robust than for PJPE ( $r=-0.079$ ,  $\rho=-0.078$ ).

When the question of whether one was picked up by police was rephrased as a count (i.e. how many times one was picked up by police and accused of something)

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<sup>47</sup> Upon comparison the point biserial estimates and their corresponding significance levels were identical to Pearson correlations estimated from these data.

the range of responses was drastically different for district and individual observations. The number of times police picked an individual up and accused them of something ranged from one to twenty times, whereas the mean per district was between one and 1.6. The individual-level scatterplots revealed two outliers in which two respondents reported being picked up ten and twenty times, respectively. Each individual level correlation was thus estimated twice, once with the full range of responses, and once restricting responses to being picked up fewer than ten times.

Being picked up by the police and accused of something was correlated with lower perceptions of PJPE when estimated at the individual and aggregate level. None of these correlations were significant, including when the restricted bounds were imposed. Being picked up by the police and accused of something was also correlated with lower PJVE when estimated at both the individual and aggregate levels. Only the Spearman estimate of the individual level correlations was marginally significant ( $p < 0.10$ ) after the bounds were imposed.

#### *Relationship between Social, Demographic, and Economic Conditions, and District Level Perceptions of Procedural Justice*

This section addresses Research Question 1b: *are social, demographic, or economic conditions associated with adolescents' perceptions of procedural justice?* Similar to RQ 1a, the question of whether social, demographic, or economic conditions are associated with adolescents' perceptions of procedural justice was addressed by first generating scatterplots and non-parametric line estimates, and then estimating the related correlation values. In the following section plots depicting the relationship between neighborhood/district level variables and perceptions of



procedural justice (Appendix E) and their associated correlations (Table 5.3) are presented; plots and correlations of district level crime and arrest data (Appendix F; Table 5.4) follow.

Table 5.3: Correlation between Procedural Justice Measures and Neighborhood/District Variables at District and Individual Level, before 2008

|                                | Police Districts    |          |    | Individuals |           |       | Bound <sup>A</sup> |
|--------------------------------|---------------------|----------|----|-------------|-----------|-------|--------------------|
|                                | Pearson             | Spearman | n  | Pearson     | Spearman  | n     |                    |
| Neighborhood Physical Disorder |                     |          |    |             |           |       |                    |
| Personal Experience            | -0.100              | -0.272   | 23 | -0.043**    | -0.051**  | 4,032 | (2.25, 4)          |
| Vicarious Experience           | -0.569              | -0.565*  | 19 | -0.049**    | -0.055**  | 2,874 |                    |
| Vicarious Experience           | 0.076               | 0.070    | 23 | -0.021      | -0.038*   | 4,079 | (2.25, 4)          |
| Vicarious Experience           | 0.427               | 0.177    | 19 | -0.064***   | -0.077*** | 2,903 |                    |
| Neighborhood Social Disorder   |                     |          |    |             |           |       |                    |
| Personal Experience            | -0.134              | -0.255   | 23 | -0.051**    | -0.059*** | 4,032 | (2.25, 4)          |
| Vicarious Experience           | -0.677              | -0.662** | 18 | -0.062**    | -0.067*** | 2,819 |                    |
| Vicarious Experience           | 0.049               | 0.034    | 23 | -0.049**    | -0.059*** | 4,078 | (2.25, 4)          |
| Vicarious Experience           | 0.442               | 0.274    | 18 | -0.066***   | -0.076*** | 2,846 |                    |
| Neighborhood Safety            |                     |          |    |             |           |       |                    |
| Personal Experience            | 0.146               | 0.202    | 23 | 0.058**     | 0.050**   | 3,725 |                    |
| Vicarious Experience           | -0.199              | -0.063   | 23 | 0.010       | 0.014     | 3,771 |                    |
| Exposure to Violence - Witness |                     |          |    |             |           |       |                    |
| Personal Experience            | -0.205              | -0.148   | 23 | -0.080***   | -0.080*** | 5,316 |                    |
| Vicarious Experience           | -0.150              | -0.235   | 23 | -0.139***   | -0.133*** | 5,315 |                    |
| Exposure to Violence - Victim  |                     |          |    |             |           |       |                    |
| Personal Experience            | -0.168              | -0.128   | 23 | -0.105***   | -0.115*** | 5,264 |                    |
| Vicarious Experience           | -0.220              | -0.110   | 23 | -0.064***   | -0.063*** | 5,315 |                    |
| Population                     |                     |          |    |             |           |       |                    |
| Personal Experience            | 0.246               | 0.212    | 23 | 0.043*      | 0.035     | 2,151 |                    |
| Vicarious Experience           | -0.352 <sup>†</sup> | -0.271   | 23 | -0.095***   | -0.083*** | 2,175 |                    |
| Population Density             |                     |          |    |             |           |       |                    |
| Personal Experience            | -0.221              | -0.234   | 23 | -0.017      | -0.015    | 2,151 |                    |
| Vicarious Experience           | 0.160               | 0.117    | 23 | 0.031       | 0.022     | 2,175 |                    |
| Median Income                  |                     |          |    |             |           |       |                    |
| Personal Experience            | 0.460*              | 0.501*   | 23 | 0.058**     | 0.039*    | 2,151 |                    |
| Vicarious Experience           | -0.281              | -0.207   | 23 | -0.084***   | -0.074*** | 2,175 |                    |
| % Adult                        |                     |          |    |             |           |       |                    |
| Personal Experience            | 0.203               | 0.194    | 23 | 0.019       | 0.0003    | 2,151 | (.65, .85)         |
| Vicarious Experience           | -0.126              | -0.098   | 20 | -0.012      | -0.015    | 1,906 |                    |
| Vicarious Experience           | 0.168               | 0.021    | 23 | -0.002      | -0.048*   | 2,175 | (.65, .85)         |
| Vicarious Experience           | -0.263              | -0.281   | 20 | -0.058*     | -0.075**  | 1,930 |                    |
| % Black                        |                     |          |    |             |           |       |                    |
| Personal Experience            | -0.119              | -0.190   | 23 | -0.007      | -0.013    | 2,151 | (0, .50)           |
| Vicarious Experience           | -0.283              | -0.374   | 13 | -0.046      | -0.009    | 957   |                    |
| Vicarious Experience           | -0.337              | -0.346   | 10 | -0.044      | -0.046    | 1,194 | (.50, 1)           |
| Vicarious Experience           | 0.029               | -0.047   | 23 | -0.013      | -0.028    | 2,175 |                    |
| Vicarious Experience           | 0.281               | 0.236    | 13 | 0.065*      | 0.090**   | 965   | (0, .50)           |
| Vicarious Experience           | -0.270              | -0.418   | 10 | -0.046      | -0.072*   | 1,210 |                    |
| % BA Degree                    |                     |          |    |             |           |       |                    |
| Personal Experience            | 0.251               | 0.318    | 23 | 0.032       | 0.021     | 2,151 | (0, .15)           |
| Vicarious Experience           | 0.210               | 0.241    | 18 | 0.025       | 0.014     | 2,048 |                    |
| Vicarious Experience           | 0.144               | -0.078   | 23 | -0.012      | -0.062**  | 2,175 | (0, .15)           |
| Vicarious Experience           | -0.501*             | -0.474*  | 18 | -0.086***   | -0.090*** | 2,072 |                    |

<sup>†</sup>  $p < 0.10$ , \* $p < 0.05$ , \*\* $p < 0.01$ , \*\*\* $p < 0.001$

<sup>A</sup> In cases with notable outliers, correlations were recalculated with post-hoc bounds, excluding extreme cases at the margins. Both unbounded and bounded correlations are reported for these cases.

### Neighborhood/District Level Variables

Neighborhood Safety and Disorder. Scatterplots and lowess plots were generated for three measures of safety and disorder: neighborhood physical disorder, neighborhood social disorder, and neighborhood safety. The plots illustrating the relationship between neighborhood physical disorder and aggregate perceptions of PJPE and PJVE revealed slight negative and slight positive trends, respectively. The aggregate plots also revealed a cluster of observations that were inconsistent with the rest. As such, each correlation for neighborhood physical disorder was estimated twice: once was the full range of disorder measures, and once restricting physical disorder observations to those with scores greater than 2.25.

The individual level correlation estimates for physical disorder and PJPE were negative and significant ( $p < 0.01$ ) for both the full and bounded samples. At the aggregate level, correlations between physical disorder and perceptions based on personal experience were negative but not significant, except for the bounded Spearman estimate, which was significant at  $p < 0.05$ . Physical disorder and PJVE were also negative and significantly correlated at the individual level when bounds were enforced.

Scatterplots of neighborhood social disorder trended slightly negative for PJPE, and were relatively flat for PJVE. Similar to physical disorder, these plots also revealed a cluster of outliers; as such each of these correlations were also estimated twice, once with the full range and once with measures of disorder greater than 2.25. Correlations of social disorder and both PJPE and PJVE were negative and significant when estimated at the individual level (for both bounded and unbounded ranges). At

the aggregate level, correlations were negative but not significant, except for the bounded Spearman estimate using PJPE, which was significant at  $p < 0.01$ .

Based on the scatterplots and lowess plots, perceptions of neighborhood safety appeared to be positively associated with perceptions of PJPE and negatively associated with PJVE. At the aggregate level, these directions were consistent for both Pearson and Spearman correlation estimates, but these correlations were not significant. Individual level correlations were positive and significant ( $p < 0.001$ ) for perceptions of neighborhood safety and PJPE, and positive and non-significant for perceptions of neighborhood safety and PJVE.

Exposure to Violence. As with the perceptions of neighborhood disorder and safety, measures of exposure to violence were collected as part of the Pathways to Desistance Study and coded according to each individual. Scatterplots and lowess plots of both exposure to violence measures (as a witness and as a victim) and both procedural justice measures were negatively sloped. The associated correlations at the aggregate level were negative and non-significant for both exposure to violence measures and both procedural justice measures. Correlations at the individual level were negative and significant ( $p < 0.001$ ) for both exposure to violence measures and both procedural justice measures.

Population and Population Density. Demographic variables captured in Census2000 were estimated as correlates of perceptions of procedural justice. Unlike the measures used as correlates up to this point, these measures were coded at the district level and did not vary over time, as the time period covering the Pathways to

Desistance Study spanned one decade, and therefore only one census. Plots depicting the relationship between the total district populations and perceptions of procedural justice showed a positive relationship with PJPE and a negative relationship with PJVE. Personal experience measures were only correlated with total population when measured at the individual level and estimated using a Pearson's  $r$  ( $p < 0.05$ ). Vicarious experiences were significant and negative for both the Pearson and Spearman correlations measured at the individual level ( $p < 0.001$ ), and marginally significant when the Pearson's  $r$  was estimated at the aggregate level ( $p < 0.10$ ). Interestingly, plots and correlations of population density trended in the reverse direction of total population. Population density appeared negatively related to PJPE and positively related to PJVE; however none of the population density correlations reached significance.

Median Income. Plots of the median income reported amongst residents in the district and PJPE depicted a positive relationship both at the individual and aggregate levels. Both Pearson and Spearman correlations of median income and PJPE were significant, suggesting that districts with higher median incomes also generally held more positive views of police based on their own experiences. However, similar to the population variables, PJVE trended in the opposite direction. Both the plots and correlations showed a negative relationship between median district income and PJVE. The Pearson and Spearman correlations were significant at the individual level ( $p < 0.001$ ) but not at the aggregate level.

Percent Adult. The scatterplots and lowess plots depicting the relationship between the percent of the population that is adults in a district and both PJPE and

PJVE revealed the presence of outliers at the upper and lower ends of the range of the adult measure in the aggregate plots. As such, each correlation for this variable was estimated twice: once using the entire range of observations and once restricting the observations to between 65 and 85 percent adults in the district population. When using the entire range of observations, the Pearson and Spearman correlation coefficients for percent adult and PJPE were positive and nonsignificant at both levels of measurement; when the observations were restricted, correlations of PJPE and proportion adult switched direction and were negative but still non-significant. When analyzing percent adult and PJVE using the entire range of observations, the correlation coefficients for percent adult and PJVE were positive and nonsignificant at the aggregate level, and negative and significant (when estimated non-parametrically) at  $p < 0.05$ . When the observations were restricted, correlations of PJVE and proportion adult were negative and only significant at the individual level.

Percent Black. The scatterplots depicting the relationship between the census variable, percent of the district population that is black and both measures of procedural justice revealed the data to be split approximately in half. About half of the observations at the aggregate and individual levels were recorded in districts where the percent black was less than 40 percent, while the balance lived in districts where the percent black was approximately 70 percent or greater. No observations fell in between 40 and 70 percent. As such, each correlation for this variable was estimated three times: once using the entire range of observations, once restricting the observations to less than 50 percent black, and once restricting observations to more than 50 percent black.

Correlations of percent black and PJPE were negative and non-significant for both aggregate and individual measures, and the full and restricted observations. Correlations of percent black and PJVE were positive when restricted to less than 50 percent black, with the Pearson and Spearman correlations of percent black and individual measures of PJVE reaching significance. Conversely, correlations of percent black and PJVE were negative and significant at the aggregate and individual level when restricted to more than 50 percent black.

Percent with Bachelor's Degree. Scatterplots and lowess plots depicted a positive relationship between the percent of a police district's population (age 25 and over) with a Bachelor's degree (based on Census2000) and both PJPE and PJVE. The plots also show that most data are clustered at or below 15 percent of the population, with a few outliers between 15 and 30 percent. To better estimate this relationship each correlation was calculated twice, once using all observations, and once restricting observations to populations with less than 15 percent of adults possessing a Bachelor's degree. The correlations between percent with a Bachelor's degree and PJPE were positive and non-significant across both aggregate and individual measures, and the full and restricted sets of observations. The correlations between percent with a Bachelor's degree and PJVE were positive and non-significant for only aggregate perceptions of the full data; when the correlations were based on individual perceptions, and when the observations (both aggregate and individual) were restricted to districts with less than 15 percent Bachelor's degrees, the correlations were negative and significant.

## Crime and Arrest Variables

Total Part I Crime. Scatterplots, lowess plots, and correlations were generated for 2006-2008 Part I crimes reported per 1,000 district residents and aggregate perceptions of procedural justice (Appendix F; Table 5.4).<sup>48</sup> The scatterplot revealed an extreme outlier with over 300 Part I crimes reported per 1,000 residents; each correlation was therefore estimated twice, once with the full array of observations and once without the outlier. Correlations of total Part I crimes reported and PJPE were non-significant and negative when the outlier was accounted for through restricting observations, and when using a Spearman coefficient. Conversely, the correlation between Part I crimes reported and PJVE was significant and positive when using all observations, and the restricted observations.

Scatterplots of Part I arrests per 1,000 population (rather than crimes reported) with procedural justice measures also revealed outliers, with two districts reporting more than 50 arrests per 1,000 residents over the two year period, while the balance reported well under 40 per 1,000. Accordingly, correlations were calculated for both the full sample and a restricted sample that excluded the two outliers. Part I arrests were negatively correlated with PJPE using the full set of observations, and significantly, negatively correlated with the restricted observations. Part I arrests were positively associated with PJVE measures, but were only significant in the Pearson correlation using unrestricted observations.

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<sup>48</sup> These correlations were only calculated at the police district level and not the individual level. Individual correlations were not calculated because linking particular crime or arrest rates to individual interview dates could reflect seasonal or other temporary spikes or lulls in crime.



Table 5.4: Correlation between Procedural Justice Measures and Crimes Reported and Arrests, before 2008

|   | Police Districts    |                     |    | Bound <sup>A</sup> |
|---|---------------------|---------------------|----|--------------------|
|   | Pearson             | Spearman            | n  |                    |
| Part I Crimes Reported/1000 Pop.            |                     |                     |    |                    |
| Personal Experience                         | 0.108               | -0.106              | 23 | (50, 200)          |
|   | -0.258              | -0.271              | 21 |                    |
| Vicarious Experience                        | 0.561**             | 0.518*              | 23 | (50, 200)          |
|   | 0.697***            | 0.666**             | 21 |                    |
| Part I Crime Arrests /1000 Pop.             |                     |                     |    |                    |
| Personal Experience                         | -0.109              | -0.286              | 23 | (0, 40)            |
|   | -0.571**            | -0.553**            | 21 |                    |
| Vicarious Experience                        | 0.424*              | 0.306               | 23 | (0, 40)            |
|   | 0.265               | 0.214               | 21 |                    |
| Part I Violent Crimes Reported/1000 Pop.    |                     |                     |    |                    |
| Personal Experience                         | -0.215              | -0.186              | 23 |                    |
| Vicarious Experience                        | 0.351               | 0.318               | 23 |                    |
| Part I Violent Crime Arrests/1000 Pop.      |                     |                     |    |                    |
| Personal Experience                         | -0.195              | -0.366 <sup>†</sup> | 23 | (0, 15)            |
|   | -0.580***           | -0.631**            | 21 |                    |
| Vicarious Experience                        | 0.402 <sup>†</sup>  | 0.379 <sup>†</sup>  | 23 | (0, 15)            |
|   | 0.301               | 0.313               | 21 |                    |
| Part I Property Crimes Reported/1000 Pop.   |                     |                     |    |                    |
| Personal Experience                         | 0.181               | -0.118              | 23 | (50, 150)          |
|   | -0.319              | -0.379              | 20 |                    |
| Vicarious Experience                        | 0.559**             | 0.501*              | 23 | (50, 150)          |
|   | 0.605**             | 0.588**             | 20 |                    |
| Part I Property Crime Arrests/1000 Pop.     |                     |                     |    |                    |
| Personal Experience                         | -0.059              | -0.213              | 23 | (0, 30)            |
|   | -0.506*             | -0.469*             | 21 |                    |
| Vicarious Experience                        | 0.412 <sup>†</sup>  | 0.350               | 23 | (0, 30)            |
|   | 0.217               | 0.266               | 21 |                    |
| Vice and Disorder Crimes Reported/1000 Pop. |                     |                     |    |                    |
| Personal Experience                         | -0.091              | -0.291              | 23 | (0, 150)           |
|   | -0.371 <sup>†</sup> | -0.455*             | 22 |                    |
| Vicarious Experience                        | 0.444*              | 0.340               | 23 | (20, 150)          |
|   | 0.498               | 0.433 <sup>†</sup>  | 21 |                    |
| Vice and Disorder Crime Arrests/1000 Pop.   |                     |                     |    |                    |
| Personal Experience                         | -0.193              | -0.319              | 23 | (0, 20)            |
|   | -0.591**            | -0.584**            | 21 |                    |
| Vicarious Experience                        | 0.393 <sup>†</sup>  | 0.307               | 23 | (0, 20)            |
|   | 0.262               | 0.227               | 21 |                    |

<sup>†</sup> $p < 0.10$ , \* $p < 0.05$ , \*\* $p < 0.01$ , \*\*\* $p < 0.001$

<sup>A</sup> In cases with notable outliers, correlations were recalculated with post-hoc bounds, excluding extreme cases at the margins. Both unbounded and bounded correlations are reported for these cases.

Part I Violent Crimes. Scatterplots and lowess plots of Part I violent crimes reported and Part I violent crime arrests made per 1,000 population depicted a generally negative relationship with PJPE, with the arrests measure including two outliers. Correlations between Part I violent crimes reported and PJPE were negative but nonsignificant, while correlations between Part I violent arrests and PJPE were negative and significant when outliers were excluded. Plots of Part I violent crimes and arrests reported per 1,000 population and PJVE depicted general positive trends, with the arrests measure again including two outliers. Correlations between Part I violent crimes reported and PJVE were positive but nonsignificant, while correlations of Part I violent arrests and PJPE were also positive, but were marginally significant ( $p<0.10$ ) when outliers were included in the correlations.

Part I Property Crimes. Plots depicting Part I property crimes and arrests reported per 1,000 population and PJPE showed general negative trends, with both the crimes reported and arrests measures including outliers. Each correlation was thus estimated twice. When outliers were excluded, correlations between Part I property crimes reported and PJPE were negative but nonsignificant, while correlations of Part I property arrests and PJPE were negative and significant ( $p<0.05$ ). When all observations including outliers were utilized, neither Part I property crimes reported or arrests made were significantly correlated with PJPE.

Plots of Part I property crimes and arrests reported per 1,000 population and PJVE depicted general positive trends, with both the crimes reported and arrests measures including outliers. Correlations between Part I property crimes reported and PJVE were positive and significant when all observations and restricted observations

without outliers were used. Correlations of Part I property arrests and PJPE were also positive, but not significant when the full or restricted observations were utilized.

Vice and Disorder Crimes. Based on scatterplots and lowess plots, the relationship between vice and disorder crimes per 1,000 population reported and arrests were negatively associated with PJPE. These plots also indicated the presence of influential outliers at the upper end of the crimes and arrests per 1,000 ranges. When all observations were included, both vice and disorder crimes reported and arrests were negatively, non-significantly correlated with PJPE. When outliers were excluded these correlations were negative and significant or marginally significant. Plots illustrating the relationships between vice and disorder crimes reported and arrests per 1,000 depicted a positive association with PJVE, and again revealed the presence of outliers. All correlations between vice and disorder crimes reported and arrests made with PJVE were directionally positive; only the Pearson's  $r$  using all observations of vice and disorder crimes reported and PJVE was significant ( $p < 0.05$ ).

### Summary of Results

To summarize, the two perceptual procedural justice measures—procedural justice based on personal experiences, and procedural justice based on vicarious experiences—do not operate in tandem. For example, it appears that PJPE does not vary significantly according to police district, while PJVE does. These findings are likely the result of the differences in the experiences that inform these two perceptual measures. It follows that perceptions based on personal experiences might not vary according to geography, as they are formed through interpersonal interactions; the quality of a one-on-one interaction with a law enforcement officer is unlikely to vary

as a function of police district, unless there is a dramatic difference in district cultures. Conversely, it follows that perceptions developed vicariously, which rely on opportunities to witness and learn about others' interactions with police, could vary more dramatically across districts, where the volume, frequency, and nature of visible police-public interactions are likely to be quite different.

Furthermore, the two procedural justice measures often trend in opposing directions when correlation coefficients are estimated. For example, measures of police per square mile and per 1,000 residents were negatively associated with PJPE and positively associated with PJVE. In other words, a higher concentration of police officers was correlated with poorer perceptions of police based on personal experiences, yet with improved perceptions of others' experiences with police.<sup>49</sup> While the exact mechanism behind this finding is unclear, it could be associated with the strong positive, significant correlations between the officer concentration and each of the crime metrics (crimes reported and arrests made for Part I total, violent, and property crimes, and vice and disorder crimes; Table 5.5). Similarly, officer concentration is also shown to be correlated with measures of neighborhood safety and disorder; areas with higher concentrations of police officers are correlated with adolescent offenders perceiving more physical and social disorder, and lower neighborhood safety. Thus, a possible explanation for the diverging correlations between officer concentration and PJPE and PJVE could be that adolescent offenders

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<sup>49</sup> While these correlations were largely non-significant, or marginally significant ( $p < 0.10$ ), the signs for PJPE were consistently negative, and for PJVE were consistently positive; additionally, the correlations were sizable at the aggregate level.

perceive the police negatively in their own interactions, but concurrently see them as effective or necessary for the safety and order of their community.

Interestingly, being picked up by the police and accused of something was significantly and negatively correlated with both PJPE and PJVE, though the magnitude of the PJPE correlation was much higher than PJVE. In other words, an individual's experience of being picked up by police was more highly correlated with negative perceptions of personal experiences with the police than negative perceptions of others' experiences. Whether or not one of the adolescent offenders in the Pathways to Desistance sample was picked up by police and accused of something was not related to the concentration of police in their district, or the level of crime in their district. As such, it is possible that those who were picked up by police felt particularly targeted or unfairly treated.

However, why being picked up and accused of something is associated with perceptions based on vicarious experiences is less clear. This measure, outlined in Appendix C, specifically asks about disparity in how different social groups (e.g. gender, age, race/ethnicity, and neighborhood) are treated by police. Perhaps those who are picked up by police also identify with the social groups they perceive to be disproportionately targeted by law enforcement. As a result, the PJVE measures would be negatively associated with their experience.

Table 5.5: Correlations between Crime, Police, and Neighborhood/District Variables, before 2008

|   | Pearson   | Spearman  | <i>n</i> |
|---|-----------|-----------|----------|
| Median Income x Officers/1000 Pop.                    | -0.464*   | -0.551**  | 23       |
| Median Income x Officers/Sq. Mile                     | -0.509*   | -0.558**  | 23       |
| Median Income x Neighborhood Physical Disorder        | -0.665*** | -0.755*** | 23       |
|   | -0.283*** | -0.277*** | 2,172    |
| Median Income x Neighborhood Social Disorder          | -0.715*** | -0.802*** | 23       |
|   | -0.264*** | -0.257*** | 2,171    |
| Median Income x Neighborhood Safety                   | 0.676***  | 0.681***  | 23       |
|   | 0.156***  | 0.154***  | 2,005    |
| % Black x Officers/1000 Pop.                          | 0.172     | 0.384†    | 23       |
| % Black x Officers/Sq. Mile                           | 0.350     | 0.451*    | 23       |
| Neighborhood Physical Disorder x Officers/1000 Pop.   | 0.090*    | 0.112*    | 503      |
|   | 0.266     | 0.456*    | 23       |
| Neighborhood Physical Disorder x Officers/Sq. Mile    | 0.079†    | 0.085†    | 503      |
|   | 0.315     | 0.376†    | 23       |
| Neighborhood Social Disorder x Officers/1000 Pop.     | 0.096*    | 0.111     | 503      |
|   | 0.333     | 0.451*    | 23       |
| Neighborhood Social Disorder x Officers/Sq. Mile      | 0.069     | 0.067     | 503      |
|   | 0.325     | 0.363†    | 23       |
| Neighborhood Safety x Officers/1000 Pop.              | -0.105*   | -0.139**  | 501      |
|   | -0.301    | -0.341    | 23       |
| Neighborhood Safety x Officers/Sq. Mile               | -0.102*   | -0.088*   | 501      |
|   | -0.438*   | -0.463*   | 23       |
| Part I Crimes Reported/1000 Pop x Officers/1000 Pop.  | 0.723***  | 0.681***  | 23       |
| Part I Crimes Reported/1000 Pop x Officers/Sq. Mile   | 0.547**   | 0.689***  | 23       |
| Part I Arrests/1000 Pop x Officers/1000 Pop.          | 0.958***  | 0.946***  | 23       |
| Part I Arrests/1000 Pop x Officers/Sq. Mile           | 0.712***  | 0.737***  | 23       |
| Part I Violent Crime Reported x Officers/1000 Pop.    | 0.601**   | 0.587**   | 23       |
| Part I Violent Crime Reported x Officers/Sq. Mile     | 0.581**   | 0.563**   | 23       |
| Part I Violent Crime Arrests x Officers/1000 Pop.     | 0.881***  | 0.883***  | 23       |
| Part I Violent Crime Arrests x Officers/Sq. Mile      | 0.702***  | 0.662***  | 23       |
| Part I Property Crime Reported x Officers/1000 Pop.   | 0.681***  | 0.655***  | 23       |
| Part I Property Crime Reported x Officers/Sq. Mile    | 0.482*    | 0.650***  | 23       |
| Part I Property Crime Arrests x Officers/1000 Pop.    | 0.946***  | 0.921***  | 23       |
| Part I Property Crime Arrests x Officers/Sq. Mile     | 0.679***  | 0.665***  | 23       |
| Vice and Disorder Crime Reported x Officers/1000 Pop. | 0.765***  | 0.769***  | 23       |
| Vice and Disorder Crime Reported x Officers/Sq. Mile  | 0.536**   | 0.598**   | 23       |
| Vice and Disorder Crime Arrests x Officers/1000 Pop.  | 0.941***  | 0.945***  | 23       |
| Vice and Disorder Crime Arrests x Officers/Sq. Mile   | 0.685***  | 0.668***  | 23       |
| Picked up by Police (#) x Officers/1000 Pop.          | 0.109     | 0.099     | 177      |
|   | -0.164    | -0.062    | 23       |
| Picked up by Police (#) x Officers/Sq. Mile           | 0.173*    | 0.169*    | 177      |
|   | -0.026    | -0.054    | 23       |
| Picked up by Police (y/n) x Officers/1000 Pop.        | 0.003     | -0.020    | 503      |
|   | 0.081     | 0.011     | 23       |
| Picked up by Police (y/n) x Officers/Sq. Mile         | -0.035    | -0.068    | 503      |
|   | 0.089     | -0.091    | 23       |

At both the aggregate and individual levels, measures of exposure to violence, as a victim and a witness were negatively correlated with PJPE and PJVE. Intuitively, estimates using individual observations showed exposure to violence as a victim was more strongly correlated to PJPE than PJVE, and exposure to violence as a witness was more strongly correlated to PJVE. As with being picked up by police, it seems as though one's immediate experiences with police and crime more generally, are associated with these perceptions.

Correlations estimating the association between neighborhood safety and disorder trended in opposite directions for PJPE and PJVE at the aggregate level, and the same direction for PJPE and PJVE at the individual level. At the aggregate level, individuals perceptions of neighborhood social and physical disorder were negatively correlated with PJPE and positively correlated with PJVE; perceptions of safety were positively correlated with PJPE and negatively associated with PJVE. As such, while at the individual level those who perceive their neighborhoods to be high in disorder and danger have worse perceptions of procedural justice based on their own experiences and others', when these perceptions are classified and aggregated according to police districts, different trends emerged. Although the aggregate correlations were not significant, the sign is still noteworthy, as the magnitude of many of the correlations was relatively high. At the aggregate level greater disorder and danger were correlated with higher perceptions of PJVE. However, due to the fact that many of the Pathways to Desistance participants were from disadvantaged areas (Tables 3.3 and 3.5), the observations from those in areas with less hardship carry less weight when correlations are estimated at the individual level, but are more

visible when observations aggregated by district. Why individuals in areas with less perceived disorder and danger might perceive PJVE differently is less clear however.



## **Chapter 6: Evaluation of the Impact of a Policy Change on Perceptions of Police Procedural Justice**

This chapter addresses the second research question posed in this dissertation: *does a change in local policy or police resources impact perceptions of police procedural justice?* The analyses presented here rely on perceptual and official data captured before and after the implementation of the Philadelphia Police Department's Crime Fighting Strategy in January 2008. It is expected that perceptions of procedural justice based on vicarious experiences will shift as a function of the Crime Fighting Strategy, while the perceptions based on personal experiences are likely to stay the same. This disparity in responses is expected due to the fact that vicarious experiences draw on one's environment and other macro level influences and experiences, while personal experiences are more strongly associated with interpersonal contacts.

Over two thousand observations of individuals before and after the Crime Fighting Strategy was implemented were recorded in the target and control districts. These observations were collected between the years 2001 and 2009. Mean procedural justice measures were calculated and compared, and revealed consistently higher values for PJPE than PJVE across each treatment group and time period before and after the Crime Fighting Strategy was put in place (Figure 6.1, Tables 6.1 and 6.2). Mean PJPE values were higher in target districts than in control districts both before and after the intervention; conversely, PJVE means were lower in the target areas than in the control areas both before and after the Crime Fighting Strategy was

implemented (Table 6.1). Mean values for PJPE appear to change more dramatically for the target districts than the control districts following the intervention; the same can be said for PJVE, but only when observations are limited to the window capturing two years before and after the policy shift.

Mean procedural justice values in the first few years of data collection were quite noisy, particularly with regard to PJVE (Figures 4.1 and 6.1); by focusing attention on the two years before and after the intervention in the subsequent between and within person analyses, perceptions captured during periods more proximate to the policy change can be compared.<sup>50</sup> As evidenced by Figure 6.1, restricting the data to this window from all years of data to just 2006-2009 yields a much different picture of changes taking place. That said, when observations are limited to the two years pre- and post-intervention the total number of observations was reduced to 707. As a result the district level evaluation of the Crime Fighting Strategy (Research Question 2a) is conducted using both the full array of data and the more acute sample; however the within individual evaluation (Research Question 2b) uses only the full sample in order to capture the highest number of interview waves for each individual.<sup>51</sup>

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<sup>50</sup> The mean PJVE values for the years prior to 2006 were:  $\bar{x}_{2001}=2.676$ ,  $\bar{x}_{2002}=2.549$ ,  $\bar{x}_{2003}=2.723$ ,  $\bar{x}_{2004}=2.715$ ,  $\bar{x}_{2005}=2.658$ .

<sup>51</sup> The within-individual analysis utilizes fixed effects estimation, and requires two or more observations from the same subject over the observation period. Because not all individuals in the sample completed sequential interviews, by restricting the sample to a window of just two years before and after the policy shift, there are few individual subjects with more than one observation during the truncated observation period.

Figure 6.1: Perceptions Pre/Post Intervention, by Procedural Justice Measure and Time Frame

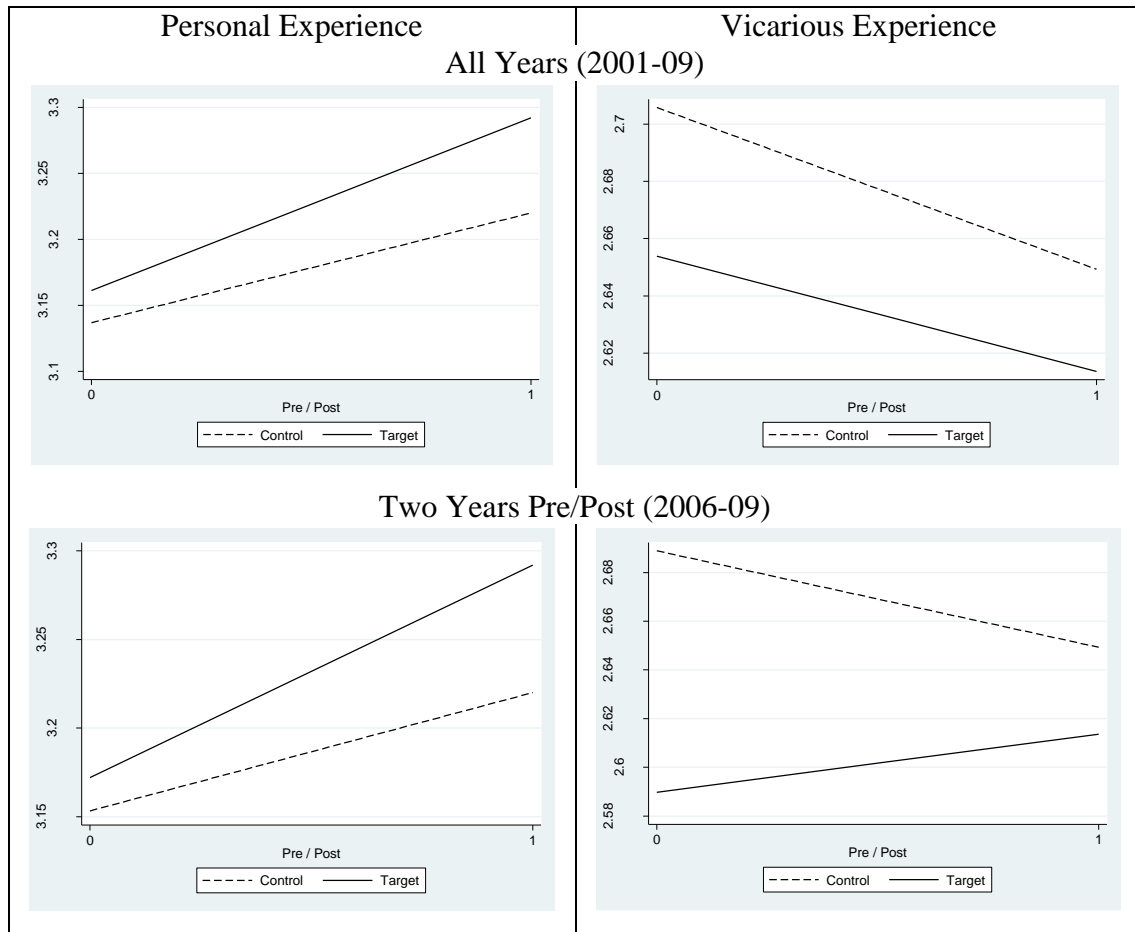


Table 6.1: Standardized Differences in Procedural Justice Perceptions based on Personal Experiences

|                           | All Years (2001-09)         |                           |            | Two Years Pre/Post (2006-09) |                           |            |
|---------------------------|-----------------------------|---------------------------|------------|------------------------------|---------------------------|------------|
|                           | Pre                         | Post                      | Difference | Pre                          | Post                      | Difference |
| Target                    | 3.161<br>(0.758)<br>n=1,350 | 3.292<br>(0.795)<br>n=131 | 0.131      | 3.172<br>(0.750)<br>n=323    | 3.292<br>(0.795)<br>n=131 | 0.120      |
| Control                   | 3.137<br>(0.717)<br>n=801   | 3.220<br>(0.740)<br>n=71  | 0.083      | 3.153<br>(0.717)<br>n=179    | 3.220<br>(0.740)<br>n=71  | 0.067      |
| Difference-in-Differences |                             |                           | 0.048      |                              |                           | 0.053      |
| $\sigma$                  |                             |                           | 0.746      |                              |                           | 0.750      |
| Z-score                   |                             |                           | 0.064      |                              |                           | 0.071      |

Table 6.2: Standardized Differences in Procedural Justice Perceptions based on Vicarious Experiences

|                           | All Years (2001-09)         |                           |            | Two Years Pre/Post (2006-09) |                           |            |
|---------------------------|-----------------------------|---------------------------|------------|------------------------------|---------------------------|------------|
|                           | Pre                         | Post                      | Difference | Pre                          | Post                      | Difference |
| Target                    | 2.654<br>(0.720)<br>n=1,364 | 2.614<br>(0.743)<br>n=132 | -0.040     | 2.590<br>(0.710)<br>n=323    | 2.614<br>(0.743)<br>n=132 | 0.024      |
| Control                   | 2.706<br>(0.747)<br>n=811   | 2.649<br>(0.747)<br>n=72  | -0.057     | 2.689<br>0.760<br>n=180      | 2.649<br>(0.747)<br>n=72  | -0.040     |
| Difference-in-Differences |                             |                           | 0.017      |                              |                           | 0.064      |
| $\sigma$                  |                             |                           | 0.731      |                              |                           | 0.733      |
| Z-score                   |                             |                           | 0.023      |                              |                           | 0.087      |

*Estimating the Effect of the Crime Fighting Strategy on Perceptions of Procedural Justice in Target and Control Districts*

This section addresses Research Question 2a, which asks: *does the influx of additional officers affect perceptions of procedural justice between individuals in target and control districts?* The procedural justice measures were compared before and after the Crime Fighting Strategy was implemented, for adolescents in target and control districts. In total four “pools” of observations were collected: adolescents in target districts before the intervention, in control districts before the intervention, in target districts after the intervention, and in control districts after the intervention.

When observations from 2006-2009 were used, the difference in mean PJPE before and after the Crime Fighting Strategy was 0.131 for target districts, and 0.083 for control districts. The difference in the change before and after the intervention for the target and control districts was 0.048, or 0.064 standard deviations (Table 6.1). The magnitudes of the differences between means before and after the intervention were similar when only the observations within two years of the Crime Fighting Strategy implementation were used.

Interestingly, when mean PJVE values from 2001 through 2009 were compared, PJVE values were lower in both target and control districts after the intervention (Table 6.2). In target districts the mean PJVE reported was 0.040 lower, and in control districts the mean was 0.057 lower; the difference in differences was 0.017 (0.023 standard deviations). When only observations from 2006 through 2009 were used, the mean PJVE reported in target districts was actually slightly higher following the intervention (0.024), while the mean PJVE reported in control districts

was lower following the intervention (0.040); the difference in differences was 0.064 (0.087 standard deviations).

Difference-in-differences regression was conducted to broadly determine if receiving the treatment (i.e. living in a target district) caused a change in perceptions of PJPE or PJVE (Table 6.3). Each model was produced twice, once with all observed years, and once with the more acute two years before and after the policy change. Additionally, a control variable accounting for the proportion of time the adolescent offenders were not incarcerated was included in these regressions. The models with PJPE as an outcome were significant when using 2001-2009 data ( $F=13.41$ ,  $p<0.001$ ,  $n=2,353$ ), and 2006-2009 data ( $F=7.14$ ,  $p<0.001$ ,  $n=704$ ). However, the interaction between time period (before or after the intervention) and whether one was in a target district was not significant in either model. The proportion of time respondents were on the street was significantly, positively associated with PJPE ( $p<0.001$ ) for both models, and may account for the significant global  $F$ -statistics.

Table 6.3: Difference-in-Differences Estimation of Perceptions of Procedural Justice

|                   | Personal Experience |                     | Vicarious Experience |                   |
|-------------------|---------------------|---------------------|----------------------|-------------------|
|                   | 2001-2009           | 2006-2009           | 2001-2009            | 2006-2009         |
| Period (pre/post) | 0.075<br>(0.091)    | 0.064<br>(0.103)    | -0.057<br>(0.090)    | -0.040<br>(0.102) |
| Target            | 0.029<br>(0.033)    | 0.029<br>(0.069)    | -0.052<br>(0.032)    | -0.100<br>(0.068) |
| Period*Target     | 0.046<br>(0.114)    | 0.047<br>(0.128)    | 0.016<br>(0.112)     | 0.063<br>(0.127)  |
| Street Time       | 0.393***<br>(0.057) | 0.550***<br>(0.109) | 0.010<br>(0.056)     | 0.009<br>(0.109)  |

Conversely, when PJVE was the outcome the difference-in-difference regressions the models were not significant, regardless of whether the model included all observations from 2001-2009 ( $F=0.87$ ,  $p=0.481$ ,  $n=2,379$ ), or just 2006-2009

( $F=0.56$ ,  $p=0.694$ ,  $n=707$ ). In these two models, none of the independent variables yielded statistically significant associations, including the interaction between being in a target district and the time period (pre- or post-intervention).

*Estimating the Effect of the Crime Fighting Strategy on Individuals' Perceptions of Procedural Justice*

This section addresses Research Question 2b, which asks: *are individual level perceptions affected by district level police staffing changes?* Panel data were coded and analyzed at the individual level and compared before and after the intervention was implemented. Changes in individual observations were assessed using fixed effects estimation (Table 6.4). The  $F$  statistic testing that the fixed effects regressors were jointly zero when the outcome was PJPE were significant for individuals in target districts ( $F=2.22$ ,  $p=0.000$ ,  $n_{\text{groups}}=347$ ,  $n_{\text{obs}}=1,367$ ) and control districts ( $F=1.93$ ,  $p=0.000$ ,  $n_{\text{groups}}=226$ ,  $n_{\text{obs}}=812$ ), indicating that the fixed effects were significant. However, the dummy variable indicating the time period (before or after intervention) was not significant for individuals in either the target or control districts, suggesting that the establishment of the Crime Fighting Strategy did not dramatically affect individuals' perceptions of PJPE. Whether one was picked up by police and accused of something was significantly, negatively associated with perceptions of PJPE for individuals in target and control districts; being picked up and accused of something during a recall period was associated with a drop in PJPE of approximately 0.4. The proportion of time one spent on the street was significant and positively related to perceptions of procedural justice for individuals in target districts, and marginally related to those in control districts. Exposure to violence measures also appear to be negatively related to PJPE.

Table 6.4: Fixed Effects Estimation of Individual Perceptions of Procedural Justice

|  | Personal Experiences           |                               | Vicarious Experiences |                   |
|--|--------------------------------|-------------------------------|-----------------------|-------------------|
|  | Target                         | Control                       | Target                | Control           |
| Period (pre/post)  | 0.038<br>(0.069)               | 0.096<br>(0.092)              | -0.038<br>(0.061)     | -0.107<br>(0.087) |
| Safety   | 0.021<br>(0.044)               | 0.038<br>(0.063)              | 0.032<br>(0.038)      | -0.046<br>(0.059) |
| Social Disorder  | 0.057<br>(0.057)               | -0.097<br>(0.069)             | -0.071<br>(0.050)     | -0.137<br>(0.065) |
| Physical Disorder  | -0.038<br>(0.058)              | 0.112<br>(0.074)              | 0.001<br>(0.050)      | 0.071<br>(0.070)  |
| Exposure to<br>Violence (Witness)  | 0.015<br>(0.016)               | -0.049<br>(0.021)*            | -0.030<br>(0.014)*    | 0.010<br>(0.020)  |
| Exp. To Violence<br>(Victim)   | -0.070<br>(0.041) <sup>†</sup> | 0.005<br>(0.052)              | -0.023<br>(0.036)     | 0.025<br>(0.049)  |
| Picked up by Police  | -0.436<br>(0.049)***           | -0.452<br>(0.064)***          | -0.054<br>(0.043)     | -0.060<br>(0.061) |
| Street Time  | 0.218<br>(0.088)*              | 0.184<br>(0.109) <sup>†</sup> | -0.102<br>(0.077)     | -0.010<br>(0.103) |
| <sup>†</sup> $p < 0.10$ , * $p < 0.05$ , ** $p < 0.01$ , *** $p < 0.001$ |                                |                               |                       |                   |

The  $F$  statistic testing that the fixed effects regressors were jointly zero when the outcome was PJVE was significant for individuals in target districts ( $F=3.66$ ,  $p=0.000$ ,  $n_{\text{groups}}=349$ ,  $n_{\text{obs}}=1,378$ ) and for individuals in control districts ( $F=3.38$ ,  $p=0.000$ ,  $n_{\text{groups}}=228$ ,  $n_{\text{obs}}=823$ ). Again, the dummy variable indicating the time period (before or after intervention) was not significant, suggesting that the Crime Fighting Strategy did not affect individuals' perceptions of PJVE. The only control variable that was significant was exposure to violence as a witness ( $p < 0.05$ ) which was negatively related to PJVE for individuals in target districts. Interestingly, being picked up by the police and accused of something, and the proportion of time spent on the street were not found to be related to PJVE.

#### Exploration of Potential Mechanisms

A series of subsequent analyses were conducted in an effort to better understand the null findings from these analyses. In the first of these analyses, police



activity was compared in target and control districts using two different self-report variables, measured at each wave. Before the Crime Fighting Strategy was implemented, there was not a statistically significant difference between whether adolescents reported being picked up and accused of something by the police, when target and control districts were compared ( $t=-0.734$ ,  $p=0.463$ ). Similarly, among those who reported being picked up by police before the intervention, the number of times individuals reported being picked up by police (if greater than zero) was not significantly different between target and control districts ( $t=0.852$ ,  $p=0.395$ ). After the intervention was put in place, when adolescents were asked if they had been picked up and accused of something by police during the reporting period there was no difference between those in the target and control districts ( $t=0.749$ ,  $p=0.454$ ). However, among those who did report being accused of something by police, adolescents living in control districts reported being picked up more often than those in target districts ( $t=2.486$ ,  $p=0.016$ ). This is contrary to what would be expected, given that the initiative implemented during that time sent additional officers and resources to the target districts, while leaving the control districts relatively unchanged. This finding does not appear to be influenced by outliers, as individuals who reported having this police contact in the post-intervention period reported between one and three contacts—in both the target and control districts.

A second post-hoc analysis was conducted to assess whether a negativity bias could explain the limited magnitude in changes to individuals' perceptions during the post-intervention period, regardless of where the adolescents lived. The presence of a negativity bias would suggest that prior perceptions influence successive attitudes

(Augustyn 2016; Baumeister et al. 2001; Rosin and Royman 2001). In the context of the present research, this would suggest that adolescent offenders, who are likely to have relatively low perceptions of the police, acquire new experiences with the police, it is less likely they will update their perceptions in a positive direction. A regression estimating the influence of perceptions before the Philadelphia Crime Fighting Strategy on perceptions after it was implemented, found that an individual's prior perceptions were significantly, positively associated with perceptions of procedural justice. This finding was consistent for both perceptions based on personal experiences and vicarious experiences.

Table 6.5: Regression to Test for Evidence of Negativity Bias

| Pre Period Measures                             | Personal Experiences (post) |                     | Vicarious Experiences (post) |                     |
|---|-----------------------------|---------------------|------------------------------|---------------------|
|   | 1                           | 2                   | 3                            | 4                   |
| Procedural Justice Perception                   |                             | 0.794***<br>(0.127) |                              | 0.778***<br>(0.104) |
| Perception in 1 <sup>st</sup> Quartile<br>(y/n) | -0.542***<br>(0.141)        | 0.098<br>(0.163)    | -0.310***<br>(0.122)         | 0.095<br>(0.142)    |
| Street Time (mean)                              | 0.244<br>(0.371)            | 0.360<br>(0.333)    | 0.329<br>(0.346)             | 0.259<br>(0.298)    |
| Picked up by Police (sum)                       | -0.059<br>(0.043)           | 0.006<br>(0.040)    | 0.007<br>(0.040)             | 0.011<br>(0.035)    |

†  $p < 0.10$ , \*  $p < 0.05$ , \*\*  $p < 0.01$ , \*\*\*  $p < 0.001$

A binary variable indicating if an individual's prior perceptions were within the lowest quartile of all recorded observations from the pre-intervention period was significantly, negatively associated with perceptions after the policy was implemented; however, this variable did not exert significant, independent effects when prior perceptions across all four quartiles were accounted for. In sum, low prior perceptions of PJPE and PJVE are associated with low perceptions of the two variables at a later point in time. However, having prior perceptions that are in the lowest quartile does not have an independent effect on subsequent perceptions. These

findings provide mixed support for the negativity bias. On the one hand, having low prior perceptions predicts having low subsequent perceptions; however, there does not appear to be a unique, independent effect for having the most negative prior perceptions.

Finally, a third analysis explored whether the percent change in officer concentration or police contact interacts with prior perceptions, to predict perceptions at a later point in time (post-intervention; Table 6.6). By estimating effects in this way, both treatment dosage (i.e. magnitude of change in police exposure) and prior beliefs are accounted for. Regardless of how police exposure is measured (officers per 1,000 population, officers per square mile, or number of contacts with the police), the results of these regressions indicate that the degree of change in exposure to officers is not associated with subsequent perceptions based on personal or vicarious experiences. Consistent with earlier analyses, prior perceptions of procedural justice are positively, significantly associated with subsequent perceptions. There is no interaction effect between these perceptions and changes to officer concentration when estimating subsequent perceptions of police procedural justice. Given the previous null findings, this lack of a relationship between change in officer exposure and perception of procedural justice is not surprising; additionally, the lack of an interaction further suggests that a negativity bias is not influencing perceptions in the post-intervention period.

Table 6.6: Regressions to Assess Interaction between Prior Perceptions and Percent Change of Police

| Pre-Period Measures   | Personal Experiences (post) |          |        | Vicarious Experiences (post) |          |          |
|---|-----------------------------|----------|--------|------------------------------|----------|----------|
|   | 1                           | 2        | 3      | 1                            | 2        | 3        |
| Procedural Justice Perception                                 | 0.759***                    | 0.806*** | 0.379  | 0.750***                     | 0.753*** | 0.870*** |
| Percent Change of Police                                      |                             |          |        |                              |          |          |
| Officers/1,000 Population                                     | -0.015                      |          |        | -0.005                       |          |          |
| Officers/Square Mile  |                             | -0.003   |        |                              | -0.002   |          |
| Contacts with Police  |                             |          | 0.011  |                              |          | -0.003   |
| Interaction (perception x concentration)                      | 0.005                       | 0.686    | -0.005 | 0.001                        | 0.0005   | 0.0003   |
| † $p < 0.10$ , * $p < 0.05$ , ** $p < 0.01$ , *** $p < 0.001$ |                             |          |        |                              |          |          |

### Summary of Results

To summarize, the results presented in this chapter do not provide evidence to suggest that the Crime Fighting Strategy caused meaningful changes in perceptions of procedural justice in target districts. The broad comparison of observations collected in target districts compared to control districts before and after the policy change did not demonstrate a significant interaction between the time period (before or after the intervention) and receiving the treatment (being in a target district). In addition to between district effects, the more powerful within-individual fixed effects models also failed to show an effect for the intervention. Individuals' changes in perceptions of PJPE and PJVE over time were not explained by the Crime Fighting Strategy.

As discussed earlier, it is not too surprising that perceptions of procedural justice based on personal experiences were not affected by the deployment of officers and resources to target districts. In fact, the results from both the difference-in-differences and fixed effects analyses were consistent with the idea that individual experiences are more important to PJPE than perceptions based on vicarious experiences. For example, in the difference-in-differences, street time was

significantly, positively related to PJPE. Those who spent less time incarcerated perceived their own experiences with the police to be more just; this same relationship was not found for PJVE. At the individual level, both street time, and whether an individual was picked up by police and accused of something were related to PJPE. Spending more time incarcerated and being accused of something by police were associated with worse perceptions of police procedural justice based on personal experiences, but again not based on vicarious experiences. These findings speak to the validity of the measure, and reinforce the idea that unless the Crime Fighting Strategy caused police to interact more frequently with adolescents in the sample, the needle on the PJPE dial was unlikely to move.

Importantly, perceptions of PJVE were not significantly associated with street time or whether an individual was picked up by police and accused of something. These results were true for both the between districts analysis (which only included the street time measure), and the within person analysis. Again, this speaks to the validity of the measures, and suggests that individuals own experiences did not influence their perceptions of how police treat others. Exposure to violence as a witness was associated with lower PJVE (in target districts), and PJPE (in control districts). This could potentially be explained as individuals perceiving police as failing to effectively do their jobs, or could be explained by the fact that low perceptions of procedural justice and higher exposure to violence are both more likely to cluster in more disordered areas.<sup>52</sup>

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<sup>52</sup> A post-hoc analysis of individual level correlations was conducted: the exposure to violence (witness) and neighborhood physical disorder Pearson's  $r=0.136$  ( $p<0.001$ ); the exposure to violence

Importantly, the post-hoc assessment calls the central assumption of this analysis—that there would be greater exposure to police officers in target districts following the intervention—into question. That the number of contacts between individuals and police was no different between target and control districts before the intervention, and in fact higher afterward, suggests that the change in number of officers did not have the anticipated outcome. Further, there was no support for a negativity bias when adolescents' prior perceptions were accounted for. Having low prior beliefs, relative to others, did not display independent effects on later perceptions. This finding was of less consequence, given the null finding of the difference-in-differences and within person analyses that preceded it.

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(witness) and neighborhood social disorder Pearson's  $r=0.215$  ( $p<0.001$ ); the exposure to violence (victim) and neighborhood physical disorder Pearson's  $r=0.074$  ( $p<0.001$ ); and the exposure to violence (victim) and neighborhood social disorder Pearson's  $r=0.112$  ( $p<0.001$ ).

## **Chapter 7: Evaluation of the Effect of Moving to a Different District on Perceptions of Procedural Justice**

This chapter addresses the third research question posed in this dissertation: *do perceptions of police procedural justice change as individuals relocate across police districts?* The analyses presented here rely on all geocoded panel data from the Philadelphia sample of the Pathways to Desistance Study to determine if perceptions of procedural justice change as one's environment changes. It is expected that perceptions of procedural justice based on vicarious experiences will shift as one relocates from one police district to another, while the perceptions based on personal experiences are likely to stay the same. Much like the hypotheses described in Chapter 6, change is expected among PJVE rather than PJPE, as vicarious experiences are theoretically more likely to be influenced by changes to their environment; in contrast, personal experiences are more strongly associated with interpersonal contacts (as evidenced by results presented in Chapter 6). For example, moving from a relatively quiet neighborhood to an area characterized by high violence and disorder, with opportunities to witness poor police-citizen interactions might result in an individual's perception of PJVE to decrease. Specifically, this chapter explores whether aggregate perceptions of procedural justice within districts vary over time, if moving is associated with changes in perceptions, and if relocating from an area with high violence (i.e. a target district) to one with lower violence (i.e. a control district) is associated with the direction of this change.

### *Stability of Individual Perceptions of Police Procedural Justice Over Place and Time*

This section addresses Research Question 3a, which asks: *are individual perceptions regarding police stable across time and place?* Panel data were coded and analyzed according to the police district in which an individual lived during an interview, and the time of the interview. Because the two time measures available—interview wave and year—were somewhat arbitrary, both were used in order to see if there was consistency in the results generated from the two measures. An interaction between police district and time was also assessed to determine if any variation in procedural justice across police districts changed with time. Unlike Research Question 2, this analysis does not examine change as a function of an intervention, but instead if perceptions differ according to time regardless of the Crime Fighting Strategy; additionally, these analyses only assess observations measured prior to 2008, to avoid any contamination from the intervention. This analysis also asks if there is something specific to geographic context that would interact with time. In this scenario, an interaction of variables across place and time might demonstrate localized district effects on perceptions of procedural justice.

Two-way analysis of variance (ANOVA) models were run, assessing the distribution of perceptions of procedural justice over time, police district, and the interaction between the two (Table 7.1). The outcomes PJPE and PJVE were each estimated twice: once with time measured in calendar years, and once with time measured in interview waves. The models with PJPE as an outcome were not significant, while the models with PJVE as an outcome were. Only the police district variable was significant for PJVE when time was measured by waves rather than



years.<sup>53</sup> It is possible that the effect was significant for wave and not for calendar year because observations were more evenly distributed amongst the n=10 interview waves (see Table 3.3) than calendar years, where relatively few interviews were conducted in the first and last years of the n=9 year period (2001-2009). Importantly, none of the models found a main effect for time or for the interaction between time and police districts, indicating that perceptions were not significantly related to periods in time or to police departments at particular periods in time.

Table 7.1: Two Way Analysis of Variance of Perceptions across Districts and Time, before 2008

|   | Personal Experiences |           | Vicarious Experiences |                     |
|---|----------------------|-----------|-----------------------|---------------------|
|   | Time=Wave            | Time=Year | Time=Wave             | Time=Year           |
| Model   | 0.89                 | 0.99      | 1.24 <sup>*</sup>     | 1.58 <sup>***</sup> |
| Police District   | 0.88                 | 1.11      | 2.55 <sup>***</sup>   | 1.00                |
| Time  | 0.46                 | 1.09      | 0.79                  | 0.25                |
| Police District*Time  | 0.88                 | 0.98      | 0.76                  | 1.13                |
| <sup>†</sup> $p < 0.10$ , $*p < 0.05$ , $**p < 0.01$ , $***p < 0.001$ |                      |           |                       |                     |

When the two-way ANOVA models were re-estimated with police districts dummy coded as target or control none of the variables were significant (Table 7.2). Thus, while it appears that perceptions of procedural justice were not evenly distributed across police districts, the district(s) influencing this outcome did not necessarily align with the target/control classification, or the effect was muted when the nine target districts were aggregated. Overall, while PJVE varied significantly according to police district (Research Question 1) the type of police district did not appear to be significantly related to measures of PJVE or PJPE.

<sup>53</sup> This finding is consistent with the results from Chapter 5, and Research Question 1, which assessed the distribution of PJPE and PJVE according to police districts.

Table 7.2: Two Way Analysis of Variance of Perceptions across Target Districts and Time, before 2008

|  | Personal Experiences |           | Vicarious Experiences |                   |
|--|----------------------|-----------|-----------------------|-------------------|
|  | Time=Wave            | Time=Year | Time=Wave             | Time=Year         |
| Model  | 1.00                 | 0.85      | 0.55                  | 1.61 <sup>†</sup> |
| Target   | 0.54                 | 0.39      | 1.82                  | 0.55              |
| Time   | 1.01                 | 1.28      | 0.41                  | 1.03              |
| Target*Time  | 0.59                 | 0.45      | 0.44                  | 0.16              |
| <sup>†</sup> $p<0.10$ , * $p<0.05$ , ** $p<0.01$ , *** $p<0.001$ |                      |           |                       |                   |

### Perceptions of Police Procedural Justice following Relocation to a New Police District

This section addresses Research Question 3b, which asks: *do movers' perceptions change more than the perceptions of individuals who did not move?*

Panel data were coded in two wave increments and analyzed according to where the respondents lived during each of the two waves. Individuals who were not in the same police district in the two sequential waves were coded as movers, individuals in the same district for both periods were coded as non-movers, and individuals who did not complete one or both of the sequential interviews were coded as missing. Movers were compared to non-movers during the period prior to their relocation across all ten waves (e.g. if an adolescent relocated between waves 2 and 3, they were compared to non-movers at wave 2; Table 7.3). While some differences between movers and non-movers were significant at discrete points in time, these differences were not sustained across waves. For example, while individuals who reported higher social disorder at wave 1 were more likely to move between waves 1 and 2, individuals who reported more social disorder at wave 4 were less likely to move between waves 4 and 5. As such, there is no clear evidence to suggest that adolescents that moved between waves were characteristically different from those that did not, based on any of the variables included in Table 7.3.

Table 7.3: Comparison of Movers to Non-Movers at Each Interview Wave

|  | Waves<br>1 & 2       | Waves<br>2 & 3      | Waves<br>3 & 4     | Waves<br>4 & 5      | Waves<br>5 & 6      | Waves<br>6 & 7      | Waves<br>7 & 8      | Waves<br>8 & 9      | Waves<br>9 & 10    |
|--|----------------------|---------------------|--------------------|---------------------|---------------------|---------------------|---------------------|---------------------|--------------------|
| N  | 144                  | 183                 | 197                | 200                 | 212                 | 203                 | 191                 | 186                 | 178                |
| Age at baseline  | 1.214                | -1.261              | -0.332             | 0.267               | -0.859              | -2.281 <sup>*</sup> | -1.847 <sup>†</sup> | -0.405              | 1.044              |
| Male   | 1.398                | 1.304               | 0.415              | 2.028 <sup>*</sup>  | 2.797 <sup>**</sup> | 2.229 <sup>*</sup>  | 0.403               | -1.517              | 0.853              |
| Black  | 2.432 <sup>*</sup>   | -1.993 <sup>*</sup> | -0.822             | -0.919              | 0.397               | 0.548               | -0.089              | -0.662              | -1.226             |
| Hispanic   | -3.202 <sup>**</sup> | 1.551               | -0.142             | -0.089              | -0.255              | -0.202              | 0.634               | -0.316              | 0.482              |
| White  | -0.328               | 0.736               | 1.200              | 1.292               | -0.384              | -0.976              | -1.046              | 0.772               | 0.732              |
| Police Procedural Justice –<br>Personal Experience ( <i>Likert: 1-5</i> )  | 0.567                | -0.292              | -0.949             | 0.222               | -1.142              | -1.350              | -0.319              | 1.056               | -0.874             |
| Police Procedural Justice –<br>Vicarious Experience ( <i>Likert: 1-5</i> ) | -1.984 <sup>*</sup>  | -0.805              | -0.521             | -0.164              | 0.963               | 0.596               | -1.207              | -1.483              | -0.504             |
| Exposure to Violence (witness)   | 0.715                | -0.516              | 1.791 <sup>†</sup> | -0.697              | 0.255               | -0.197              | 0.733               | -0.496              | 1.326              |
| Exposure to Violence (victim)  | 0.443                | 0.280               | 0.228              | 0.287               | -0.134              | -0.076              | 0.923               | -0.492              | -0.713             |
| Neighborhood safety  | -0.131               | 0.012               | -0.368             | 0.243               | 1.158               | 1.640               | 1.611               | -0.069              | 2.117 <sup>*</sup> |
| Social disorder  | 2.781 <sup>**</sup>  | 0.958               | -1.398             | -1.865 <sup>†</sup> | -1.469              | -0.364              | -1.073              | -1.135              | 0.383              |
| Physical disorder  | 1.946 <sup>†</sup>   | 0.39                | -0.599             | -1.342              | -2.051 <sup>*</sup> | 0.953               | -1.239              | -1.47               | -0.369             |
| Target   | 0.729                | -2.088 <sup>*</sup> | 0.875              | -0.598              | -0.317              | 0.113               | 0.792               | -2.535 <sup>*</sup> | 0.342              |

*t*-test compared movers to non-movers during the wave prior to the movers' relocation; <sup>†</sup> $p < 0.10$ , <sup>\*</sup> $p < 0.05$ , <sup>\*\*</sup> $p < 0.01$ , <sup>\*\*\*</sup> $p < 0.001$

The procedural justice perceptions of individuals who moved to a different police district between two sequential interview waves were compared to those who did not move between the two waves. The mean difference between perceptions in the two sequential periods was marginally significant and greater for movers than non-movers for PJPE ( $t=1.507$ ,  $p=0.066$ ,  $n=1,657$ ), and less for movers than non-movers for PJVE, though non-significant ( $t=-1.143$ ,  $p=0.127$ ,  $n=1,694$ ).<sup>54</sup>

Among those who moved to a new police district only 19.8 percent held the same numerical perceptual measure for PJPE following their move; conversely, 25.1 percent of non-movers reported the same numerical measure for personal experiences over two sequential periods (Table 7.4). For PJVE, movers were more likely to report the same numerical perceptual score over the two periods in which they moved (15.3 percent) than individuals who remained in the same district over two sequential waves (13.4 percent; Table 7.5). That said, perceptions of procedural justice based on personal experience among movers and non-movers alike appeared to be relatively more stable across two sequential interview waves than perceptions based on vicarious experiences.

Of those who moved from target districts to control districts, approximately half had improved perceptions of PJPE (52.5%) and PJVE (46.3 %) in the interview following their move (Tables 7.4-5). Moving from control districts to target districts produced less clear trends, with perceptions of PJPE decreasing following the move

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<sup>54</sup> These differences were calculated by taking the absolute value of the difference between perceptions recorded during the wave before the move, and the wave after the move. This was done so that the degree of change could be analyzed, and so that perceptions that decreased in value did not mute the effect of perceptions that increased in value.

among only 31.4 percent of movers, and PJVE decreasing among 45.6 percent of movers. Non-movers' opinions of PJPE were relatively evenly distributed across the three possibilities (perception decreased: 39.9%, stayed the same: 25.1%, increased: 35.0%), while opinions on PJVE were more prone to changing than staying the same (perception decreased: 43.6%, stayed the same: 13.4%, increased: 43.0%).

Table 7.4: Direction of Change in Personal Perceptions of Procedural Justice among those who Moved and Did Not Move, by District Type

|                   | Movers       |              |              |        | Non-Movers   |              |              |        |
|-------------------|--------------|--------------|--------------|--------|--------------|--------------|--------------|--------|
|                   | Before>After | Before=After | Before<After | Total  | Before>After | Before=After | Before<After | Total  |
| Control - Control | 10           | 5            | 8            | 23     | 210          | 148          | 196          | 554    |
|                   | 43.5%        | 21.7%        | 34.8%        | 100.0% | 37.9%        | 26.7%        | 35.4%        | 100.0% |
|                   | 15.4%        | 14.7%        | 11.0%        | 13.4%  | 35.5%        | 39.7%        | 37.7%        | 37.3%  |
| Target - Target   | 34           | 12           | 28           | 74     | 382          | 225          | 324          | 931    |
|                   | 45.9%        | 16.2%        | 37.8%        | 100.0% | 41.0%        | 24.2%        | 34.8%        | 100.0% |
|                   | 52.3%        | 35.3%        | 38.4%        | 43.0%  | 64.5%        | 60.3%        | 62.3%        | 62.7%  |
| Control - Target  | 11           | 8            | 16           | 35     |              |              |              |        |
|                   | 31.4%        | 22.9%        | 45.7%        | 100.0% |              |              |              |        |
|                   | 16.9%        | 23.5%        | 21.9%        | 20.3%  |              |              |              |        |
| Target - Control  | 10           | 9            | 21           | 40     |              |              |              |        |
|                   | 25.0%        | 22.5%        | 52.5%        | 100.0% |              |              |              |        |
|                   | 15.4%        | 26.5%        | 28.8%        | 23.3%  |              |              |              |        |
| Total             | 65           | 34           | 73           | 172    | 592          | 373          | 520          | 1,485  |
|                   | 37.8%        | 19.8%        | 42.4%        | 100.0% | 39.9%        | 25.1%        | 35.0%        | 100.0% |
|                   | 100.0%       | 100.0%       | 100.0%       | 100.0% | 100.0%       | 100.0%       | 100.0%       | 100.0% |

Table 7.5: Direction of Change in Vicarious Perceptions of Procedural Justice among those who Moved and Did Not Move, by District Type

|                   | Movers       |              |              |        | Non-Movers   |              |              |        |
|-------------------|--------------|--------------|--------------|--------|--------------|--------------|--------------|--------|
|                   | Before>After | Before=After | Before<After | Total  | Before>After | Before=After | Before<After | Total  |
| Control - Control | 12           | 4            | 8            | 24     | 249          | 79           | 240          | 568    |
|                   | 50.0%        | 16.7%        | 33.3%        | 100.0% | 43.8%        | 13.9%        | 42.3%        | 100.0% |
|                   | 16.0%        | 14.8%        | 10.7%        | 13.6%  | 37.7%        | 38.9%        | 36.8%        | 37.4%  |
| Target - Target   | 30           | 12           | 35           | 77     | 412          | 124          | 413          | 949    |
|                   | 39.0%        | 15.6%        | 45.5%        | 100.0% | 43.4%        | 13.1%        | 43.5%        | 100.0% |
|                   | 40.0%        | 44.4%        | 46.7%        | 43.5%  | 62.3%        | 61.1%        | 63.2%        | 62.6%  |
| Control - Target  | 16           | 6            | 13           | 35     |              |              |              |        |
|                   | 45.7%        | 17.1%        | 37.1%        | 100.0% |              |              |              |        |
|                   | 21.3%        | 22.2%        | 17.3%        | 19.8%  |              |              |              |        |
| Target - Control  | 17           | 5            | 19           | 41     |              |              |              |        |
|                   | 41.5%        | 12.2%        | 46.3%        | 100.0% |              |              |              |        |
|                   | 22.7%        | 18.5%        | 25.3%        | 23.2%  |              |              |              |        |
| Total             | 75           | 27           | 75           | 177    | 661          | 203          | 653          | 1,517  |
|                   | 42.4%        | 15.3%        | 42.4%        | 100.0% | 43.6%        | 13.4%        | 43.0%        | 100.0% |
|                   | 100.0%       | 100.0%       | 100.0%       | 100.0% | 100.0%       | 100.0%       | 100.0%       | 100.0% |

### Summary of Results

To summarize, the results presented in this chapter indicate that individual and district level perceptions of procedural justice do not vary systematically over time, but that time is nevertheless related to PJPE. While individuals' perceptions do not appear to necessarily vary in a unified way over time, they also do not appear to be time stable. The analysis of movers demonstrated that individuals' perceptions of procedural justice tended to change in the period between two sequential interviews, regardless of whether they moved or lived in a high crime district. While the movers' perceptions of PJPE changed significantly more than non-movers, 75 percent of non-movers perceptions were not the same from one time period to the next.

One possible explanation behind the results suggesting a relationship between PJPE and time is that personal experiences are more directly tied to the aging of the individual, as previous research has indicated that older age is tied to more favorable perceptions of the police (Dunham and Alpert 1988); similarly, as many of these adolescent offenders begin to desist from crime the frequency of their contact with police is likely to decline. However, a post-hoc assessment of the association between being picked up by police and accused of something and interview wave was positively correlated ( $r=0.117$ ,  $p<0.001$ ), as was the number of times an individual was picked up and accused of something ( $r=0.119$ ,  $p<0.001$ ).<sup>55</sup> This suggests that individuals are actually having more contact with police over time, as their perceptions of PJPE are increasing; in other words, individuals in the Pathways to

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<sup>55</sup> These correlations were calculated using observations prior to 2008 in order to be consistent with the data used in the ANOVA and OLS models. Those models used data from before 2008 so that measures would not be affected by the Philadelphia Crime Fighting Strategy.



Desistance Study develop improved perceptions of police, even as their contacts increase.

This chapter provided less insight into the factors that influence measures of PJVE. It was anticipated that relocating to a new district would be associated with a dramatic change in perceptions of procedural justice based on vicarious experiences. However, as one's surroundings and opportunities to observe interactions between police and civilians shifted, there was no measurable difference in the level of change in PJVE from one interview wave to the next of movers compared to non-movers.

## Chapter 8: Discussion

This dissertation sought to improve our understanding of how macro-level factors, such as police concentration, socio-economic factors, crime, and other geographically varying circumstances relate to serious adolescent offenders' perceptions of police procedural justice. This study was operationalized three ways in an effort to answer the three research questions discussed throughout this text. First, this study estimated the strength of the association between macro level influences (e.g. census level data, police district level data) and perceptions of procedural justice; individual level perceptions of macro level phenomena (e.g. adolescents' perceptions of neighborhood safety or disorder) were also assessed in relation to perceptions of procedural justice. Second, perceptions were analyzed in relation to an initiative that was implemented at the police district level across nine police districts. The influence of enhancing the number of police on both aggregate perceptions of those in the targeted districts, and within-individual changes were assessed. Lastly, the role of district context was explored in relation to individuals' updating of perceptions over time and space; particularly, whether their perceptions of police procedural justice changed to a greater degree when individuals moved from one police district to another, relative to those who remained in the same district.

The analyses presented in the preceding chapters revealed a consistent theme: serious adolescent offenders' perceptions of procedural justice based on personal and vicarious experiences do not run in tandem. While extant research has demonstrated that they are of unequal weight in shaping opinions (e.g. Augustyn 2016; Rosenbaum et al. 2005), the analyses

presented here demonstrate that there are some circumstances where these two perceptual measures have opposing associations with crime, and some census variables. With regard to the crime variables, more crimes reported, and more arrests made per 1,000 residents were negatively correlated with PJPE and positively correlated with PJVE, across all crime types explored. Recall that a central hypothesis in this dissertation was that more exposure to potentially witnessing police activity would be associated with poorer perceptions of PJVE. Given that all crime measures assessed were significantly, positively associated with police concentration, the finding that PJVE is positively associated with crime rate is quite surprising. It seems as though more potential exposure to witnessing police is correlated with higher perceptions of PJVE, but lower perceptions of PJPE. Thus, more police and more crime were associated with poorer perceptions of PJPE and higher perceptions of PJVE, contrary to expectations. A possible explanation for why more crime could be associated with higher appraisals of how the police treat others is that the offenders in these high crime districts are more likely to have been victims of crime themselves. However, both PJPE and PJVE are negatively associated with exposure to violence measures—both as victims and witnesses; as such, it cannot explain why the two procedural justice measures trend in opposite directions.

The numerous measures of crime are not the only instances in which PJPE and PJVE diverge. Individual perceptions of procedural justice were correlated with aggregate census measures in order to understand how individuals' perceptions relate to the socio-economic context of their home district. Many of these correlations were in opposite directions for PJPE and PJVE. Again, counter to what we might anticipate, perceptions based on vicarious experiences were positively correlated with population density, while perceptions based on personal experiences were negatively correlated. Admittedly, these two correlations were not

significant, but nevertheless the signs were consistent when the correlations were estimated using both Spearman and Pearson estimators, and when the individual observations were aggregated. Again, this runs counter to the idea that more opportunities for observation would be negatively associated with offenders' perceptions of procedural justice from vicarious experiences.

Additionally, living in a district with a higher median income and a higher percent of residents with Bachelor's Degrees was associated with higher perceptions of procedural justice based on personal experience and lower perceptions based on vicarious experiences. This particular finding could be due to the fact that income and neighborhood safety are positively correlated; as such, this likely reiterates the disparate correlations observed between PJPE and PJVE with crime and arrest rates. In other words, areas with a higher median income and more educated populous also likely experience less crime; thus the same relationship is anticipated for income and education, as was observed with crime rates. It is possible that these macro-level indicators, which could be considered indicative of quality of life, also indicate the nature of the policing that occurs. It is unlikely that adolescent offenders who live in areas with a higher quality of life (i.e. lower crime, higher income) experience the same intensity of policing as those who live in areas with high crime and poverty. Officers have been shown to deploy higher levels of force when suspects are encountered in disadvantaged neighborhoods, and those with higher homicide rates, regardless of situational factors (Terrill and Reisig 2003). This could help to explain the negative correlation between these district-level census measures and PJPE, but still fails to account for the positive association with PJVE.

These initial findings highlight the need for subsequent research to investigate the independent mechanisms driving these two perceptual measures. While prior studies have begun to investigate the two measures' relative influence on perceptions of legitimacy (e.g. Augustyn

2016; Rosenbaum et al. 2005) the finding that they may actually be discordant with one another is a unique contribution. This is particularly surprising since data sets such as the Pathways to Desistance include a procedural justice “summary” measure, which combines the fourteen indicators of PJPE with the five indicators of PJVE. Had a summary measure been utilized in the place of the two separate measures, this issue would have been masked, as the PJPE and PJVE measures would have caused some of the correlations to appear near zero.

The second set of analyses in this dissertation revealed that the Philadelphia Crime Fighting Strategy—the macro-level policy initiative directing more officers and resources to high crime areas—had no discernable impact on perceptions of procedural justice. Neither comparisons between or within adolescent offenders’ perceptions of procedural justice before and after the Strategy was enacted, indicated a discernable trend. Thus, it does not appear that the Crime Fighting Strategy alone affected perceptions of either PJPE or PJVE in a measurable way. The lack of an effect could be for a number of reasons. First, it is possible that perceptions of procedural justice require more than a change in the concentration of police to yield a measurable shift. This is not a satisfying explanation, as exposure to more police-citizen interactions should be particularly important to informing one’s opinions of the police based on vicarious experiences; however, measures that could be considered proxies for exposure to police were uncorrelated or positively correlated with procedural justice in Research Question 1.

Perhaps the subjects’ status as offenders is playing a role here. Previous research suggests that amongst serious adolescent offenders, vicarious experiences are less consequential than personal experiences, and interactions with the police have a diminishing effect after a particular threshold (Augustyn 2016). Conversely, research on the general population has revealed a heavier reliance on vicarious experiences with the police, since the frequency or likelihood of

their having personal interactions with law enforcement is relatively low (Eith and Durose 2011; Rosenbaum et al. 2005). As such, it is possible that an effect of the Crime Fighting Strategy might have been observed for perceptions of PJVE if a sample of the general public, rather than serious adolescent offenders, had been utilized.

Another possibility is that the treatment dosage was not high enough for the adolescents studied to perceive a change in the strength of the police force. It is difficult to estimate the exact change in the strength of the police force in each target district, as some of the supplemental officers were deployed from entities such as the Summer Mobile Force Unit, and were not permanently assigned to specific districts. As such, the administrative data do not provide the exact number of officers assigned to a police district on a given day, because floating assignments such as the Summer Mobile Force could change day-to-day. Thus, depending on how these mobile units spent their time, the shift could have been much more dramatic for some target districts than others. Similarly, it is possible that statistical power also played a role. When observations were limited to adolescents with geographical information, and then divided amongst treatment and control groups, and pre-intervention and post-intervention periods, the sample size decreased sizably. This, coupled with relatively low treatment dosage could make it unlikely to find a statistically significant effect.

Additionally, the Strategy was designed and executed at the police district level; estimations of police density were calculated using the number of officers divided by the total population, and by the total square mileage for each district. However, it is established that citizens and police alike are not equally distributed across space; instead crime, and therefore police and citizen contacts concentrate in much smaller areas (e.g. Pierce et al. 1988; Sherman et al. 1989). For reasons of confidentiality, residential information for the adolescents in the

Pathways to Desistance study was not available at a more fine-grained level than the police district. Additionally, there is less readily-available documentation about where within target districts the supplemental officers and resources were directed. Thus, while it is quite likely that the sample of serious adolescent offenders was disproportionately represented in the areas that received more concentrated targeted enforcement, this assumption could not be verified by the data available.

A final potential explanation for the lack of observed effects relates to the issue of valence—or whether the personal or vicarious experiences with police that informed one’s perceptions of procedural justice were positive or negative. It is possible that individuals in targeted districts had more exposure to police officers as a result of the Crime Fighting Strategy, and updated their perceptions more than those in control districts; even if this were the case, heterogeneous experiences, with some being positive and some being negative, could have muddled a clear, directional effect. However, this dissertation operated under the assumption that serious adolescent offenders were more likely to lower their perceptions of police when more officers entered their district for two reasons: (1) negativity bias, and (2) backfire effect. Research suggests that offenders and individuals who have experienced more frequent police contacts generally have poorer perceptions of the police than average citizens (Gau and Brunson 2009; Mylonas and Reckless 1968). A negativity bias exists in that those who evaluate police more negatively experience less positive changes in their successive perceptions (Augustyn 2016; Baumeister et al. 2001; Rosin and Royman 2001; Skogan 2006). Thus it is more likely that serious adolescent offenders from Philadelphia, who were disproportionately young, black, males, were going to have lower baseline perceptions of the police; and if additional exposure leads to updates, subsequent perceptions would trend negatively, even if the interaction was

consistent with principles of procedural justice. However, a post-hoc analysis failed to find any independent effects for having a lower baseline perception, relative to other adolescents, prior to the intervention.

Additionally, by packaging the initiatives in the Crime Fighting Strategy as targeting the most violent areas in the city, it was possible that the “backfire” phenomena described in hotspots and terrorism literature (e.g. LaFree et al. 2009; Pate et al. 1986; Weisburd et al. 2011) could be triggered. Clearly this particular analysis provided no support for the idea that labeling a place as dangerous might lead individuals to have worsened perceptions of their safety and of law enforcement. Again, it is unclear if there might have been evidence to support the notion if the sample was comprised of the general public. On the one hand, they might take less notice of the increased police presence, but it is also possible that they have a higher sensitivity to their place of residence being labeled a high crime area.

While the quality of interactions between the adolescents and police could not be accounted for, the magnitude and direction of perception changes could be explored in the context of adolescent offenders who moved from one police district to another, over two sequential interview waves. In this scenario, the macro-level context again did not have a consistent effect on perceptions of procedural justice, and the results were counter to expectations. Movers’ perceptions of procedural justice based on personal experiences did change more than non-movers (reaching marginal significance), whereas the degree of change in movers’ perceptions of procedural justice based on vicarious experiences were not discernable from non-movers. This was contrary to expectations, as it was anticipated that a change in district would affect perceptions of vicarious experiences more so than personal experiences. Just over 40 percent of movers reported higher perceptions of PJPE, and 37 percent reported lower



perceptions after the move. Thus, offenders' perceptions did not change in a consistent direction after they relocated. This finding was also surprising given that PJVE had been found to vary significantly across districts, whereas PJPE did not. Additionally, whether they moved from target districts to control districts, or control districts to targets, did not seem to be associated with perceptions—PJPE or PJVE—shifting in a predictable way.

Among the takeaways from this particular analysis is that while offenders' perceptions of procedural justice do not change in a way that can be fully explained by macro-level contexts (which is expected), moving is still associated with a sizable shift in PJPE. One possible explanation for a shift in perceptions based on personal experiences being associated with a move, is that moving to a new district could provide a level of anonymity; despite their history as serious adolescent offenders, these individuals may not be known to the police in their new residence. However, the PJPE results were relatively split, with about half of those whose perceptions changed following a move decreasing, and about half increasing. So, it is still unclear what it is that could be behind this effect.

### Implications

In sum, the research presented in this dissertation has yielded two key takeaways: (1) perceptions of procedural justice based on personal experiences operate differently than perceptions based on vicarious experiences; and (2) changing an adolescent offender's environment, either with regard to the police context, or moving districts altogether, is not associated with a change in vicarious perceptions of police procedural justice. Again, these findings could largely be due to the lower weight that offenders place on vicarious experiences,

and that their opinions about others' experiences might be less malleable due to their high frequency exposure to police, relative to the general public.

In recent years, and even months, more police departments have placed a focus on understanding community perceptions of police procedural justice (e.g. Rosenbaum et al. 2015). Based on the results presented here, it appears critical that these instruments separate measures of perceptions of the police based on personal experiences from perceptions based on vicarious experiences. While it may seem intuitive to ask more triangulating questions that inform a singular summary measure, it appears that—at least among adolescent offenders—these two types of perceptions do not capture the same phenomenon; these appear to be two separate mechanisms, and as such, should be measured separately.

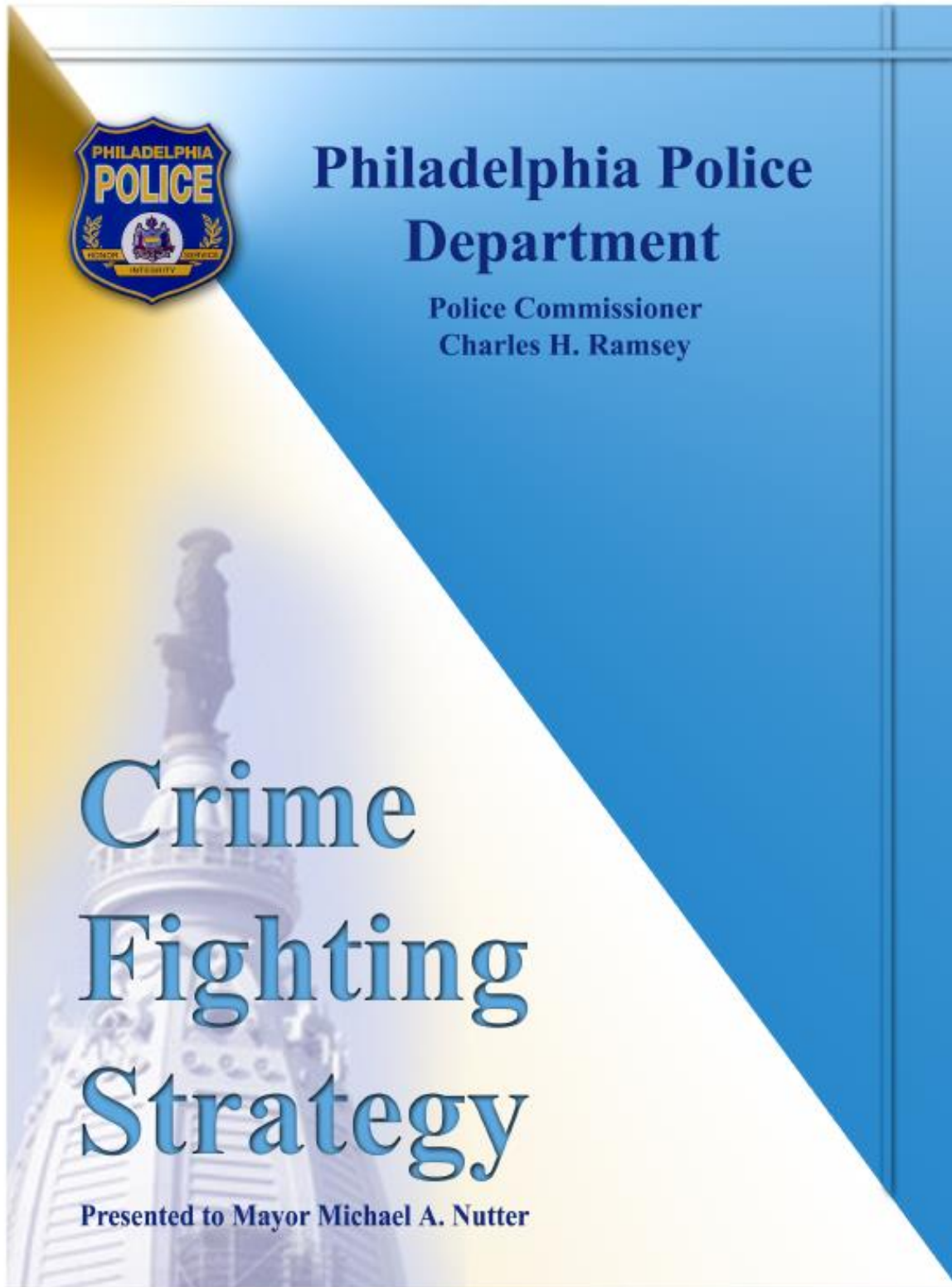
As the present research was conducted using the opinions and perceptions of serious adolescent offenders, it warrants follow-up inquiry with a sample of the general public. Prior research has provided a convincing case for why offenders and the general public should not be studied in a single sample, as their experiences and perceptions are quite different. The findings from this dissertation about the role of context, police presence, and different measures of procedural justice (i.e. PJPE and PJVE) demonstrated a general lack of effects for changes to police presence and environment, and a divergence in effects for PJPE and PJVE. However, it is quite possible that the outcomes of these analyses would be different had a sample of the general population been utilized. Findings related to serious offenders have implications with regard to future offending activity—if perceptions of police procedural justice improve, then compliance with laws can potentially follow suit. Unfortunately, this analysis did not produce findings to suggest how to improve offenders' perceptions of the police from a macro-level policy perspective. However, perhaps if the same analyses were conducted using a general population

sample, findings related to improving perceptions of the police might emerge. While improving the public's perceptions of police procedural justice is unlikely to have a sizable impact on offending, as most are unlikely to offend anyway, other outcomes such as cooperation with law enforcement, and improved police-community relations could emerge.

## Appendices

### Appendix A: Philadelphia Police Department Crime Fighting Strategy Document

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The Honorable Michael A. Nutter  
Mayor's Office  
City Hall - Room 215  
Philadelphia Pa 19107

January 30, 2008

Dear Mayor Nutter:

It is with great pleasure that I present to you the Philadelphia Police Department's Crime Fighting Strategy. This strategy is designed to reach your goal of reducing homicides by thirty to fifty percent over the next three to five years. I believe we can reach this ambitious goal and the other goals I set for this Department. We will work tirelessly to achieve success.

This is a holistic document addressing the key elements of organizational and operational change. I have taken this opportunity to revise the Department's mission statement to reflect our core work of fighting and preventing crime. In addition, I believe that an organization driven by core values and guiding principles will be much more effective than one guided solely by rules and regulations.

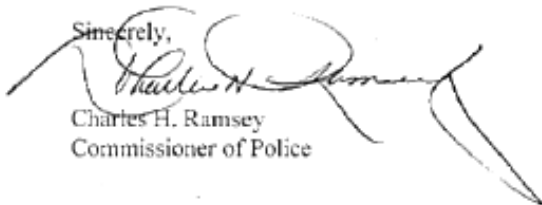
The Philadelphia Police Department will employ a diverse and effective set of crime fighting strategies to accomplish our mission. The strategies are based on the guiding principles and our understanding of the nature and extent of crime in Philadelphia and on the needs and aspirations of the community, as expressed in a series of town hall meetings I held throughout the City since you charged me with developing this strategy. I am holding a department-wide meeting on January 30<sup>th</sup> to reveal the elements of this strategy to the members of the police department.

This is a living document and will be updated quarterly, reporting on progress and identifying next steps. Finally, in accordance with the Department's community policing philosophy, district commanding officers will work with their own members and with members of the community to create a district specific crime fighting plan to address the priorities in their districts.

Finally, you directed me to review the Philadelphia's Police Department deadly force policy. I have done so and it is attached as an Appendix to this report.

I look forward to discussing this crime fighting strategy with you. Most of all, I look forward to working with you and every city agency to achieve our overriding goal of making Philadelphia a much safer city.

Sincerely,



Charles H. Ramsey  
Commissioner of Police

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human intelligence. We will develop innovative strategies to combat crime and disorder. We will constantly monitor the success of these strategies against ever changing trends and patterns. Adjustments will be fluid and immediate when necessary.

**B. Collaboration.**

Fighting crime and disorder is not just the job of the police. It is the job of everyone. All stakeholders in Philadelphia must come and work together on both a citywide and neighborhood level to combat these problems. We are all accountable. Thus, the Philadelphia Police Department will aggressively seek to establish and re-establish real, working partnerships with our communities, the public and private institutions, and other, city, state and federal agencies to set goals and to implement strategies. Only as a true collaborative team, with real accountability, will we achieve our common goal of a safer Philadelphia.

**C. Prevention.**

Fighting crime and disorder alone will not make the citizens of Philadelphia feel safe in their homes and on the streets. Thus, the Philadelphia Police Department will dedicate resources to prevent crime and disorder from occurring in the first place. But prevention is also the work of families, schools, the clergy, the courts, public and private social service agencies and the business community. Knowing this, the Philadelphia Police Department will share, as appropriate, its information and expertise with these entities so that everyone will know how to better prevent crime and disorder from even occurring. As a result, all residents of Philadelphia can be focused on the same goal, and we can begin to ensure a better future for all Philadelphians.

**D. Continuous Improvement in Operations and Administration.**

The organization and its policies and procedures must be constantly reviewed and refined to ensure that internal activities are efficiently and effectively driving toward mission accomplishment. This means that we must look for best practices and adapt them to our situation, that we eliminate or reduce bureaucracy where feasible, that members are trained in current policies, procedures and operations, that equipment and facilities are in optimal condition, that technology is appropriately applied to solving problems and improving operations, and that people are assigned to functions that best fit their talents, skills, and knowledge.

## Principles and Strategies to Make Philadelphia a Safer City

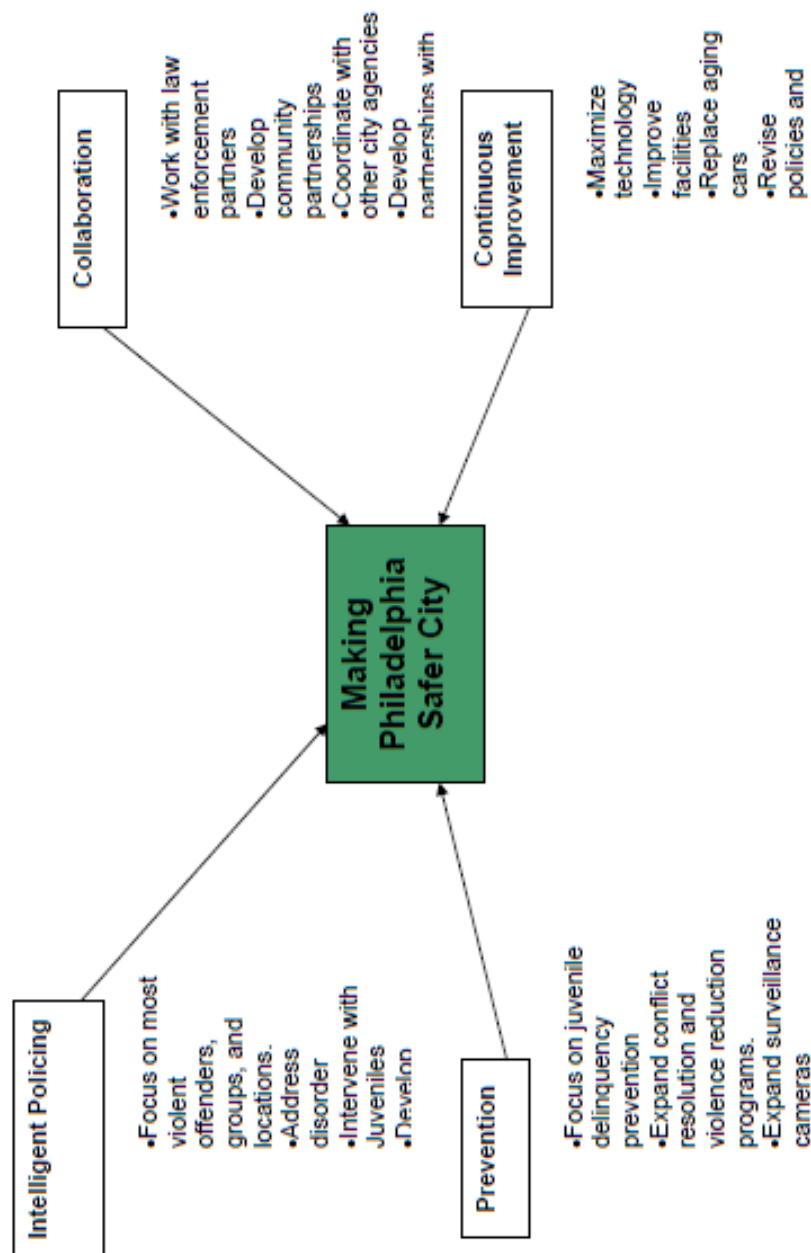


Figure 1: Result Map

We live in an ever changing world. As a result, the specific tactics and actions of our crime fighting strategy will change over time, as crime changes and progress is made. However, our mission, core values and guiding principles will not change. Ultimately, we will be judged not just on the reduction of crime but also on how well we individually and collectively fulfill our mission while being true to these values and principles. I am convinced that the two go hand-in-hand: by vigorously and passionately adhering to our core values and guiding principles, we will fulfill our mission by having a dramatic and positive impact on crime and disorder in our city.

My promise, as the Police Commissioner, is to hold myself and every member of the Philadelphia Police Department to these core values and guiding principles. I will work every day to provide the resources, support, and leadership to the men and women of this great police department so that together we can fulfill our solemn oath to the people of Philadelphia.

## **PERFORMANCE GOALS.**

This crime fighting strategy is intended to achieve Mayor Nutter's goal of reducing homicides by thirty to fifty percent over the next three to five years. It is time for this department to set bold and aggressive goals in reducing crime and apply the necessary resources to achieve those goals. Consistent with that by the end of calendar year 2008 we will:

- Reduce homicides by twenty-five percent (25%)
- Decrease the number of shooting victims by twenty percent (20%)
- Reduce Part I violent crimes by twenty percent (20%)
- In 2007, there were 5,386 guns taken off the street. We will increase that number by five percent (5%).
- Increase the homicide clearance rate to sixty-five percent (65%)
- Increase the clearance rate for all other violent crimes by five percent (5%)
- Significantly reduce the backlog of 6,000 pieces of ballistic evidence waiting testing.
- Significantly reduce the backlog of outstanding warrants.

## **CRIME FIGHTING STRATEGY**

### **Nature and Extent of Crime in Philadelphia.**

Figures 2, 3, and 4 illustrate the most recent trends of Part I crimes, violent crimes, and murder victims from 2003 through 2007. Part I crimes include homicide, rape, robbery, aggravated assault, burglary, theft, and auto theft. Violent crimes represent murder, shootings, aggravated assaults and robberies. The charts show that these crimes peaked in 2006, with numbers declining to



levels of previous years in 2007. The number of murders in 2007 was below the level for 2006 but still remained above the levels of prior years. Driving Part I crimes, violent crimes, and murder below the 2007 levels also means taking them below 2003 and 2004 levels.

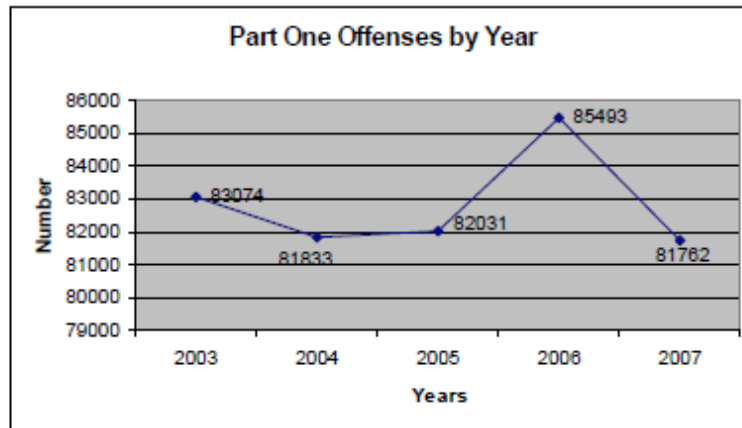


Figure 2: Part One Offenses by Year

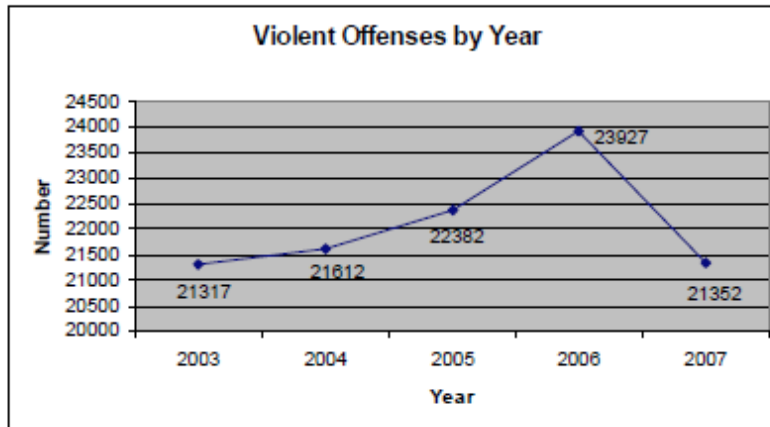


Figure 3: Violent Offenses by Year

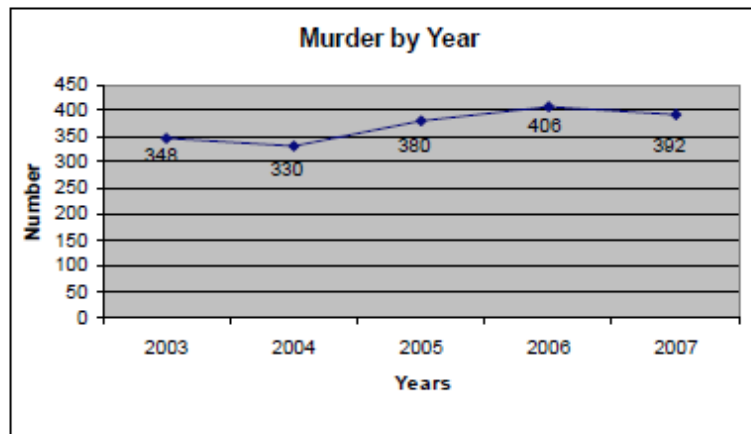


Figure 4: Murders by Year

We can only fight crime once we understand it. That means we must drill down deeper to understand where crime is occurring and when. It is only then that a crime fighting strategy can be tailored to maximize resources and impact.

Figure 5 illustrates that nine of the twenty-three patrol districts account for the majority of murders, shootings, aggravated assault, and robberies.

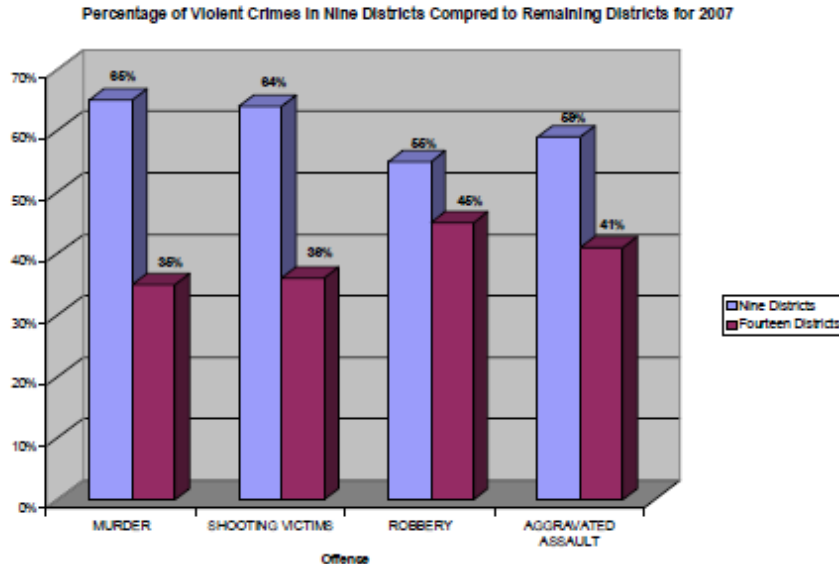


Figure 5: Comparison of Violent Crime of Nine Districts

These nine patrol districts in 2007 accounted for sixty-five percent (65%) of the homicides, sixty-four percent (64%) of the shooting victims, fifty-five percent (55%) of the robberies, and fifty-nine percent (59%) of the aggravated assaults. This violence is occurring in nine of the twenty-three districts. Yet, as the crime maps illustrate in Figures 6 through 10, even within these districts there are hot spots. By focusing resources and special attention to the violence in these districts, the overall safety of Philadelphia will improve.

Not only is crime disproportional across the city it varies by time of day. Figure 6 shows that sixty-five percent (65%) of the violent crimes occur between the hours of 3 pm and 2:59 am. These are the times that additional staffing is required.

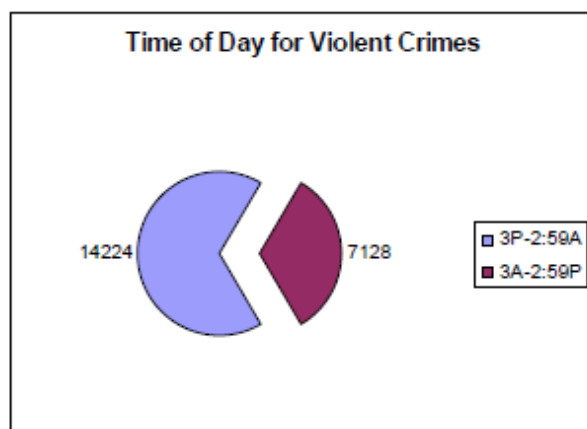


Figure 6: Time of Day for Violent Crime

We also know that crime is committed by a relatively small number of people. It is often the same individuals committing crimes over and over again. In Philadelphia there are approximately 50,000 adults on county probation or parole and another 9,000 adults on state parole. In addition, there are 6,000 juveniles under supervision. There are an estimated 2,810 outstanding arrest warrants for offenders in Philadelphia.

Even within the criminally prone population, there are subgroups of offenders. It is estimated that about ten percent (10%) of the juvenile probation population are high risk for committing a violent crime. For adults under supervision, it is projected that around 6,000 are high risk offenders. It is necessary that the police work with parole and probation agents to help monitor and intervene with high risk offenders.

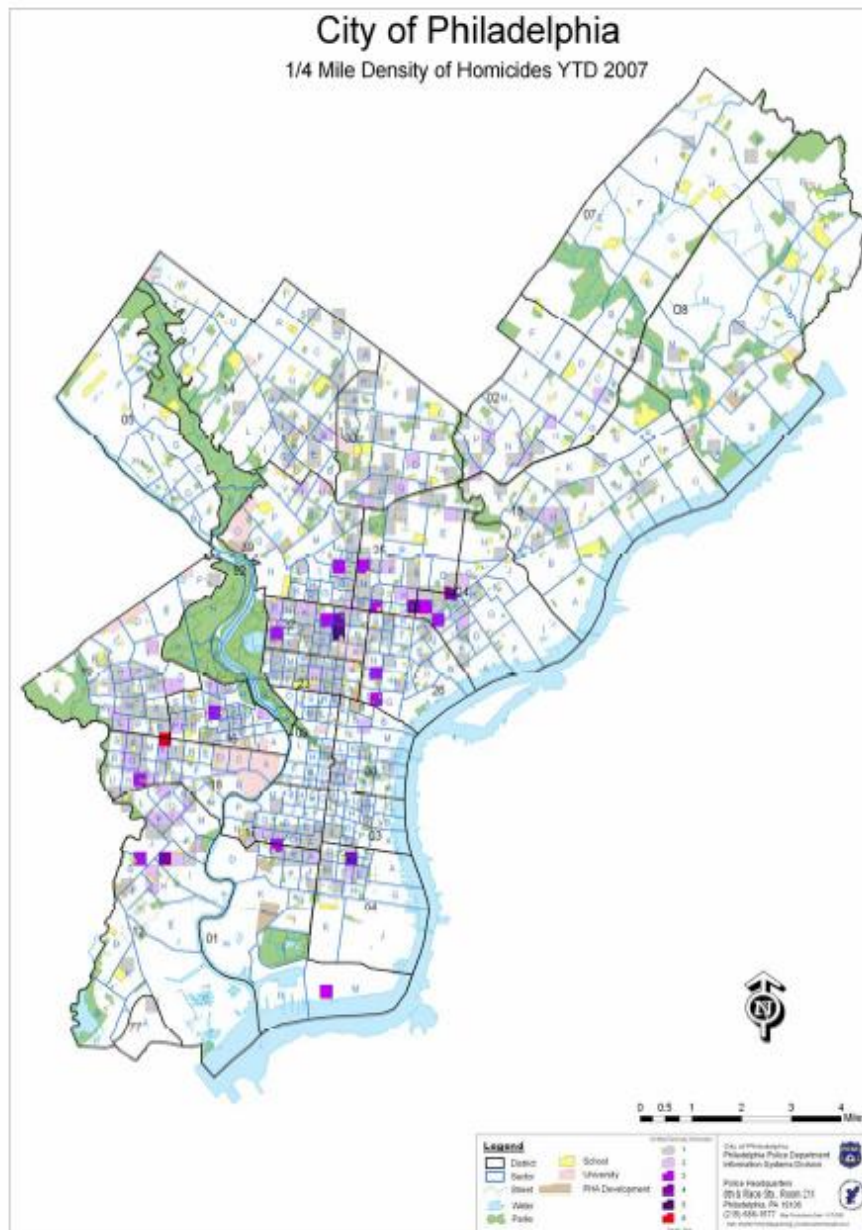


Figure 7: 2007 Homicides

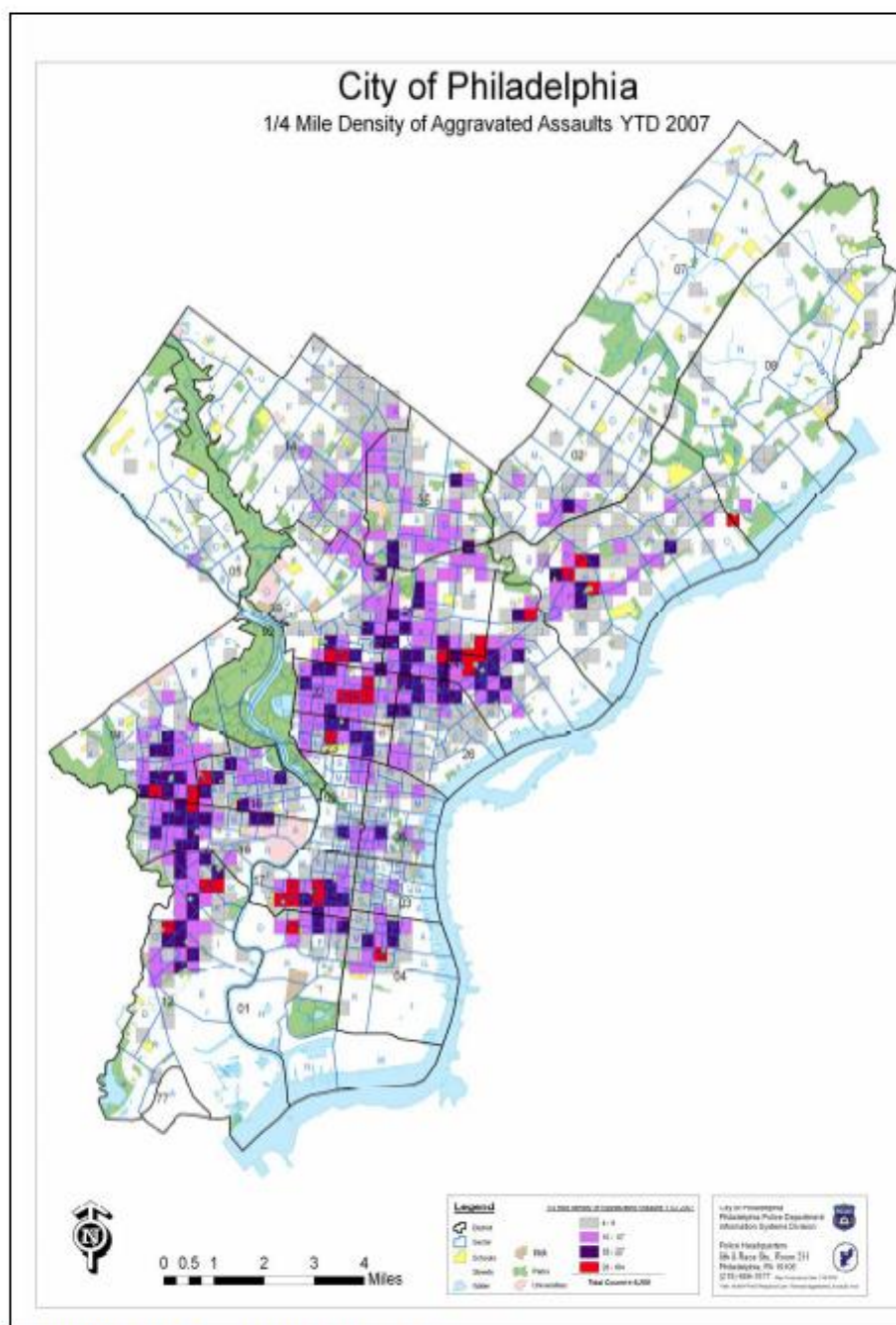


Figure 9: 2007 Aggravated Assaults

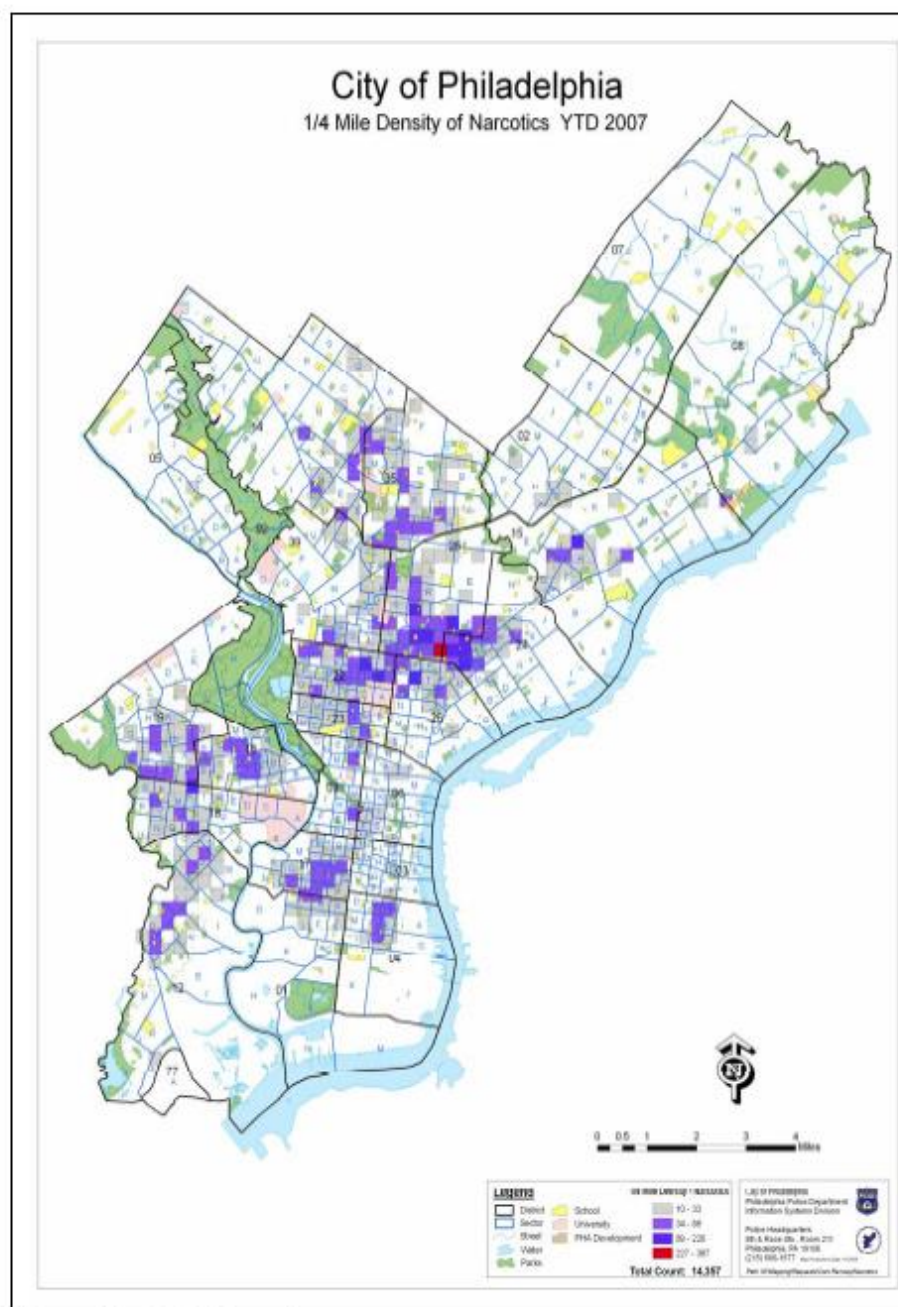


Figure 10: 2007 Narcotics



identifies next steps will be provided to the Mayor quarterly with regular updates as part of the City-stat process. Finally, in accordance with the community policing philosophy, District Commanding Officers are directed to work with their members and the community to create a district specific crime fighting plan to address the priorities in their districts.

#### **Highlights of the Crime Fighting Strategy Action Plan**

Work has already begun and some tasks are completed. This includes outreach to the community in the development of this plan, identification of high risk districts, and staffing needs for those districts. This strategy addresses all the neighborhoods of Philadelphia and all the units in the Philadelphia Police Department.

- All District Commanding Officers will hold open, monthly meetings with residents of their district.
- Each district commander will develop and make available, a Spring/Summer Crime Fighting Plan to address the unique crime and disorder problems of their district.
- Specialized units will be used in any district that requires additional resources to address a problem. However, as the data showed, violent crime is not equal across this city and we must recognize this reality and address it.
- The Department will coordinate with Federal, State and Local law enforcement agencies to target individuals and organizations committing violent crime in Philadelphia with priority given to the nine districts.

As previously mentioned, an analysis of 2007 homicides, shootings, robberies and aggravated assaults identified nine districts, as being the most violent:

Southwest Police Division  
12<sup>th</sup> District  
18<sup>th</sup> District  
19<sup>th</sup> District  
Northwest Police Division  
14<sup>th</sup> District  
35<sup>th</sup> District  
39<sup>th</sup> District  
Northeast Police Division  
15<sup>th</sup> District  
Central Police Division  
22<sup>nd</sup> District  
East Police Division  
25<sup>th</sup> District

be monitored for all districts and adjusted as needed. These fourteen districts will:

- Use overtime to extend tour of duties to cover high crime areas and time periods.
- Receive recruits to ensure minimum district staffing levels.
- Have access to Highway Patrol and Narcotic Strike Force units.
- Achieve and maintain sixty percent (60%) of all sworn staffing in Uniform Patrol.
- Receive redeployed officers from specialized units and administrative staff.

The following pages describe key elements of the Crime Fighting Strategy Action Plan. Elements of this Strategy will change with time as progress is made and lessons are learned.

#### **A. Intelligent Policing Strategies**

1. The Philadelphia Police Department must address the issue of illegal guns in this City on many fronts. Accordingly, we will immediately implement city wide aggressive, proven tactics, such as, but not limited to; lawful stop and frisk tactics, increased VUFA (violation of uniform firearm act) and aggravated assault warrant service, and increased lost and stolen gun investigations. Accordingly, we will immediately begin training officers in order to implement these tactics.
2. Identify the most violent districts and develop targeted enforcement down to the sector level. Starting in February, crime briefings for the targeted districts will be held a minimum of three times (3X) a week until the goals are achieved.
3. Establish and operationalize a twenty-four hour, seven day-a-week, Real Time Crime Center by the Fall 2008. This center will provide offender, location, and crime from databases as detectives respond to a crime scene. In addition the center will be the Department's operations center.
4. Reassign and return uniform officers from some administrative and tactical assignments to the Patrol Bureau to accomplish targeted enforcement and sector integrity. This will also enhance better interaction with the communities they serve via a combination of foot, bike, vehicle, and Segway patrols. This review and required actions will be taken by May 1, 2008.



5. Currently there are 2,810 arrest warrants for all types of crimes. This does not include traffic, bench or violation warrants. This is unacceptable. Warrant service is the responsibility of all police officers. Thus, the Philadelphia Police will substantially enhance and prioritize warrant service citywide down to the sector patrol officer. For example, all districts will, by February 28, 2008, on a regular and consistent basis, develop, by district sector, a printout with photographs indicating the last known residence of all people wanted on warrants. The Philadelphia Police Department will also work with churches, courts, and the U.S. Marshal Service to promote voluntary turn-in of people on low level warrants.
6. To improve our response, we will establish mobile rapid response command centers to be dispatched to every homicide and other major crimes to immediately assist and support the investigation and, equally important, to prevent the loss of any further life through retaliatory violence. These vehicles will be equipped with technology that will allow immediate access to databases to obtain the information needed to solve crime.
7. All life has value. Every homicide victim and their families deserve the best the Philadelphia Police Department can offer. It is important that appropriate family members are kept informed of the status of the investigation into the death of their loved one. In addition to improved ongoing communications with the survivors of homicide victims, the Homicide Unit will hold "next of kin" meetings with the families of homicide victims. The first of these meeting will take place in May of 2008.
8. Homicide not only tears a family apart, it also damages a neighborhood. Young people who witness a homicide scene or lose a friend are affected. The Philadelphia Police Department will work with social service agencies and clergy to establish grief counseling for family, friends, and neighbors of a homicide victim. Our responsibility will be to ensure that these services are contacted immediately after a homicide.
9. It is well known that crime and disorder patterns change with the seasons. Accordingly, District Commanding Officers will be charged with developing district level seasonal plans in advance. This will allow them to better facilitate comprehensive tactics proactively at the beginning of a seasonal shift rather than being reactionary once the seasonal pattern has begun. The first draft of such plans, covering the Spring and Summer months, are due March 1, 2008. A final copy of the plan will be given to every officer and posted on the Department's Website.

10. Order maintenance theories, such as the "Broken Windows," are effective tools for the police and communities to reclaim and maintain neighborhoods. When used intelligently and with discretion, these tactics can not only restore a decent quality of life, but can also impact serious and violent crime. Accordingly, the Philadelphia Police Department will develop plans on both the citywide and district levels to best utilize these concepts to make positive, measurable impacts in our communities. These actions will be reflected in district plans due March 1, 2008. Actions will include, but are not limited to, comprehensive, strict nuisance and quality of life enforcement.
11. All of city government must have a sense of urgency when dealing with crime and disorder issues. In conjunction with the Managing Director's Office, we will work with representatives from other city agencies to establish interagency teams that will go into an area and clean it up by removing abandoned cars, boarding up abandoned buildings, removing graffiti, improving street lighting, and filling pot holes. By focusing not only police resources but all city resources on cleaning up these chronic areas, we will help remove the opportunities for crime and disorder. Priority will be given to the areas experiencing the majority of violence.
12. Juvenile crime and delinquency issues plague many communities throughout Philadelphia, negatively impacting the quality of life. The Philadelphia Police Department recognizes this fact and will continue to enforce both truancy and curfew laws. Recent evaluations of the current system for dealing with these problems in the city have shown significant flaws. The Philadelphia Police Department will participate with other government agencies in a comprehensive evaluation of the City's truancy and curfew programs. We will also work toward expanding the Juvenile Enforcement Team into the nine districts.
13. All children deserve to have the opportunity to get an education in a safe environment. This includes not only while they are in school, but also while they are going to and from school. Accordingly, the Philadelphia Police Department, along with the School District, will develop measures to enhance safety in the schools and will create real, safe passages or corridors for our children when going to or coming home from school. District Commanding Officers will immediately enhance uniform police presence at arrival, dismissal, SEPTA sites, sporting events and other special events at schools and reflect these efforts in their district plans. In addition, PPD will

assist the school district in the development of a safety plan for every school in the city.

14. Traffic offenses in the neighborhoods are not only a direct safety hazard but also negatively impact the quality of life. Last year 137 traffic fatalities were recorded compared to 120 the previous year. The number of people killed as a result of traffic accidents in our City is unacceptable. Accordingly, the Philadelphia Police Department will immediately develop plans on the citywide and district level to better address traffic and speed enforcement including, but not limited to, expanding automated traffic enforcement, traffic speed trailers, and DUI enforcement.
15. A citywide review of sectors has not been done in decades. The current structure is not in line with community policing and effective policing strategies. Geographic boundaries are a contributing factor to effectively and efficiently assigning and maximizing police resources. Geographic boundaries are also the foundation to community policing by ensuring that sufficient and consistent officers are assigned to police within those boundaries. A redesign of the sector concept and boundaries will be completed by Fall of 2008.
16. Explore re-establishing the Mounted Patrol. The goal is that this unit would be totally funded by private donations. The Mounted Patrol would not only work in our parks but also in the neighborhoods.
17. Review federal, state and local task forces to ensure their mission is consistent with the needs of the Department.
18. Review deployment of detectives based on workload to enhance the quality of investigations and successful closure.
19. Review and adjust staffing levels in patrol districts, detective and specialized units to ensure they are consistent with the day of week and time of day crimes are occurring citywide.

#### **B. Collaboration Strategies**

1. Criminals who use guns during the commission of crime are a direct and imminent danger to our communities. The federal gun laws have substantial penalties which include mandatory minimum sentencing. Thus, the Philadelphia Police Department will work with the U.S. Attorney's Office and the ATF to substantially increase the

number of gun cases prosecuted at the federal level. The current ballistic backlog is unacceptable. As previously mentioned, there are 6,000 pieces of ballistic evidence waiting to be tested. This impedes the Department's ability to identify offenders and prosecute gun cases efficiently. Therefore, we will take immediate steps to reduce this backlog which may include outsourcing ballistic analyses to agencies such as independent contractors and the Pennsylvania State Police.

2. The Philadelphia Police Department will work with community-based organizations like Ten Thousand Men, Men United, and Mothers in Charge to intervene and prevent violence in our neighborhoods. The Commissioner will kick-off this partnership with a meeting in February.
3. Philadelphia, regrettably, is often negatively impacted with respect to statewide criminal rules or procedures. For example, only in Philadelphia must a person be physically brought to a police facility to be issued a summary citation. However, all other officers outside of Philadelphia can merely issue the person a handwritten citation, much like a traffic ticket. This unnecessarily removes uniform officers from the street and reduces police visibility. Accordingly, the Philadelphia Police Department will immediately and continuously lobby both the Courts and the Legislators to correct not only this situation, but also ensure future rules implemented actually work to help and not hinder Uniform Patrol.
4. Many offenders in our communities are currently on probation or parole, including many juveniles. These offenders are free to walk our communities, but with express limitations. The City of Philadelphia can not allow these convicted criminals to wantonly violate the conditions of their release with impunity. Thus, the Philadelphia Police Department will expand and enhance its partnerships with both the Adult and Juvenile Departments of Probation and Parole and begin developing plans for joint accountability checks of parolees and probationers to ensure they are in strict compliance with the terms of their release or sentence. We will also work together to make sure that crucial information, such as outstanding warrants, are shared as near to real-time as possible.
5. The federal government is part of our community with vast resources and powers. We have already partnered with the FBI, ATF, DEA and other federal agencies. However, we must make certain that all of us are working toward our common goal of targeting those people in our communities who do the most harm.



Therefore, we will develop specific and measurable goals with outcome indicators to ensure all our resources are focused on these individuals. To immediately begin this process, a strategy meeting with all of our federal partners will be scheduled in March 2008.

6. It is well known that a large majority of the criminals in our communities are repeat offenders. Effectively prosecuting these offenders for higher sentencing can be difficult without timely and efficient coordination with the District and U.S. Attorney's Offices. Thus, the Philadelphia Police Department will work with the prosecutors to make certain that repeat offenders are identified and brought to the attention of the court in an effort to maximize appropriate sanctions. We will work with the community in making sure the court is aware of the harm that these individuals cause a community.
7. For the communities to effectively collaborate and help fight crime and disorder in their neighborhoods, they too need information. Accordingly, preliminary neighborhood crime data will be made available to our communities. The most efficient manner in doing so is via the official Department website. Accordingly, the Philadelphia Police Department will immediately take steps to ensure that this will be accomplished as soon as possible, with a target date of May 2008.
8. Town watches are effective tools at the district level to abate both crime and disorder. Therefore, District Commanding Officers will work with existing town watches and encourage neighborhoods to establish town watch organizations. To begin this process, by spring 2008, the Police Department will host a citywide conference with all town watch organizations to share information and ideas.
9. We recognize that many conditions facilitate crime and disorder in our communities that require actions of other governmental agencies. These include graffiti removal, trash removal, street and alley lighting, and sealing abandoned buildings. The Philadelphia Police Department will work with the Managing Director to develop a protocol that will give priority to addressing these conditions. The protocol must make sure that the conditions contributing to crime and disorder are handled with urgency.
10. Philadelphia is a city of unique neighborhoods with very different characteristics and traits. Officers must be aware of these characteristics and traits to be effective crime and disorder fighters. Often an officer's unawareness can lead to community

misperceptions, complaints and even hostility against the officer. This directly distracts the Philadelphia Police Department from accomplishing our mission. Therefore, we will work with local community groups to develop a "community orientation" program for newly assigned officers to a district. The objective of the program will be to familiarize our officers with their newly assigned community and for the communities to better know their officers. This program will be in place by April 2008 with the next graduation of a recruit class. And likewise, community relations officers will provide training for the community about the police department.

11. The numerous colleges and universities throughout Philadelphia must be a part of any overall plan to address crime and disorder in this city. Accordingly, the Philadelphia Police Department will convene a meeting with the Directors of Security for each of our institutions in February 2008. The goal of this meeting will be to create clear contacts for each district commander to address quality of life problems with students and to begin to determine how the safety and security resources of these institutions can begin to work in unison with the Philadelphia Police Department towards our common goal.
12. In addition, we will work with the universities and colleges to establish internships, research opportunities for Master and Doctoral students, and support faculty research designed to help us evaluate our policies, programs, training, and improve our operations.

#### **C. Prevention Strategies**

1. Children need positive activities after school, at nights and on the weekends. Children involved in these programs are less likely to commit crime or to become victims. Accordingly, the Philadelphia Police Department will help encourage participation in existing Police Athletic League (PAL) Programs and will develop or facilitate plans with the Department of Recreation and our community partners to create other after school-type programs. Each District Commanding Officer will work with churches, community-based organizations, and service organizations to implement youth programs in addition to PAL by this summer.
2. Retaliatory violence is a large problem in Philadelphia. Programs such as the Youth and Adolescent Violence Reduction Programs are excellent initiatives and deserve full commitment by the Philadelphia Police Department. But more must be done to break

the cycle of violence citywide. Accordingly, the Philadelphia Police Department will aggressively intercede to reduce retaliatory acts.

3. Surveillance cameras are excellent tools to document and prosecute criminals, but their mere presence has a dramatic deterrent effect, thus preventing crime in the immediate area. Accordingly, the Philadelphia Police Department will strive to expand its existing surveillance camera program from twenty-six to 250 cameras by December 31, 2008.
4. Many people unknowingly put themselves at risk of criminal victimization. It is important for the citizens of Philadelphia to know how to protect themselves from becoming a victim. Hence, the Philadelphia Police Department will provide preventive information on a regular and consistent basis provided through community meetings, the Department's website, and the news media.
5. The Police Explorer Program is an effective tool in turning our children away from crime and delinquency. It provides our children with a sense of belonging and allows them to build positive relationships and trust with police officers. Accordingly, the Police Department will develop plans to enhance its existing program, affording the opportunity for more children to participate.

#### **D. Continuous Improvement Strategies**

1. The biggest problem identified by commanders affecting unity of command, squad cohesion, morale, supervisory accountability, professionalism, and staffing levels is the current work schedule. This must change. Although the Police Department maintains exclusive managerial rights regarding shift schedules, a working committee will research alternate shifts for the Department to effectively remedy the problems identified.
2. An essential element of continuous improvement is measuring performance as assessed by the people we serve. Therefore, the Philadelphia Police Department coordinate with the City to contract a resident survey measuring the sense of safety and security among residents and their degree of satisfaction with police services. The first survey will be completed by December 2008.

## NEXT STEPS

The structure of an organization must be aligned to support its mission. To that end, I have begun the process of reorganizing the Philadelphia Police Department. The reorganization will be completed by the end of March 2008.

This strategy paper is just the first step of our plan to reduce violence and address crime and disorder in Philadelphia. A Deputy Commissioner has been identified as the goal champion for each of the four guiding principles and underlying strategies. They are responsible for ensuring that the words on this paper are given life and action is taken to realize the strategies. This will not happen overnight, but I do expect immediate action and progress. Every day in my morning meeting with the Deputy Commissioners we will review progress and issues. The Deputy Commissioners are also responsible for ensuring that responsibility is cascaded down the organization to every police officer, detective, and civilian member of the department.

Chief Inspectors, Inspectors and Commanding Officers will be charged to work with our Federal, State, Local and Community partners to make these strategies a reality. Many of these strategies require working across the Department and breaking down traditional silos. The Command Staff is expected to make this happen in line with our values and principles.

The core of a police department is patrol. It is the District Commanding Officers who will be required to tailor these strategies to the unique needs of their districts. All other functions exist to support patrol. Therefore, Commanding Officers of non-district units are expected to implement strategies that will support the District Commanding Officers. Each command will have stated goals and objectives for reducing crime.

Action will not wait. Today these strategies will begin to be implemented. At the same time, a clear vision of the outcomes and the means of achieving them is the only way to ensure that everyone is working toward the same goals. So, I am requiring every Commanding Officer, Inspector, and Chief Inspector to submit a plan of action with specific tasks, assignments, due dates, and performance goals to me by March 1, 2008.

No community prospers or even survives long without safety. Safety is why people come together to govern themselves in the first place. Just as providing for the common defense is the fundamental obligation of our national government, it is the very first obligation of local government to protect the lives of its residents. This plan provides the framework to achieve the first priority



Mayor Michael A. Nutter put forth in his inaugural address. It seeks to unite the resources of the whole community to calm the violence, restore order, and begin to build a tangible future for people who today don't see one. Working together, we can achieve this goal.

Appendix B: Pathways to Desistance Police Procedural Justice: Personal Experience

1. During your last contact with the police when you were accused of a crime, how much of your story did the police let you tell? [Reverse coded]  
[Converted to 5 pt. Likert scale]
  - (1) All of it
  - (2) Most of it
  - (3) Some of it
  - (4) None of it
2. The police treat me the same way they treat most people my age.
  - (1) Strongly disagree
  - (2) Disagree
  - (3) Neither agree nor disagree
  - (4) Agree
  - (5) Strongly agree
3. Over the last couple of years, the police have been treating me the same way they always treated me in the past.
  - (1) Strongly disagree
  - (2) Disagree
  - (3) Neither agree nor disagree
  - (4) Agree
  - (5) Strongly agree
4. During my last encounter with the police, they treated me in the way that I expected they would treat me.
  - (1) Strongly disagree
  - (2) Disagree
  - (3) Neither agree nor disagree
  - (4) Agree
  - (5) Strongly agree
5. During my last encounter with the police, they treated me in the way I thought I should be treated.
  - (1) Strongly disagree
  - (2) Disagree
  - (3) Neither agree nor disagree
  - (4) Agree
  - (5) Strongly agree

6. Even after the police make a decision about arresting me, there is nothing I can do to appeal it. [Reverse coded]

- (1) Strongly disagree
- (2) Disagree
- (3) Neither agree nor disagree
- (4) Agree
- (5) Strongly agree

7. Even after the police make a decision about arresting me, someone in higher authority can listen to my case, and even in some cases, change the decision.

- (1) Strongly disagree
- (2) Disagree
- (3) Neither agree nor disagree
- (4) Agree
- (5) Strongly agree

8. Police considered the evidence/viewpoints in this incident fairly.

- (1) Strongly disagree
- (2) Disagree
- (3) Neither agree nor disagree
- (4) Agree
- (5) Strongly agree

9. Police overlooked evidence/viewpoints in this incident. [Reverse coded]

- (1) Strongly disagree
- (2) Disagree
- (3) Neither agree nor disagree
- (4) Agree
- (5) Strongly agree

10. Police were honest in the way they handled their case.

- (1) Strongly disagree
- (2) Disagree
- (3) Neither agree nor disagree
- (4) Agree
- (5) Strongly agree

11. Police used evidence that was fair and neutral.

- (1) Strongly disagree
- (2) Disagree
- (3) Neither agree nor disagree

- (4) Agree
- (5) Strongly agree

12. Police made up their mind prior to receiving any information about the case.  
[Reverse coded]

- (1) Strongly disagree
- (2) Disagree
- (3) Neither agree nor disagree
- (4) Agree
- (5) Strongly agree

13. Think back to the last time the police accused you of doing something wrong.  
Did the police treat you with respect and dignity or did they disrespect you?  
[Reverse coded] [Converted to 5 pt. Likert scale]

- (1) Respect/Dignity
- (2) Neutral Treatment
- (3) Disrespect

14. Think back to the last time the police accused you of doing something wrong.  
Did the police show concern for your rights? [Reverse coded] [Converted to 5  
pt. Likert scale]

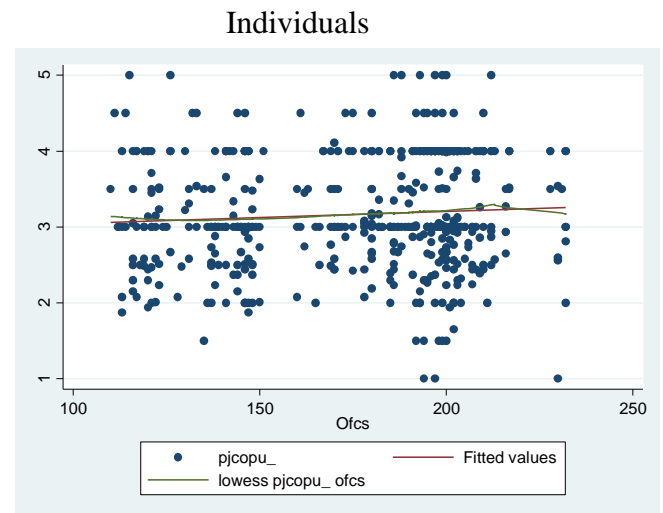
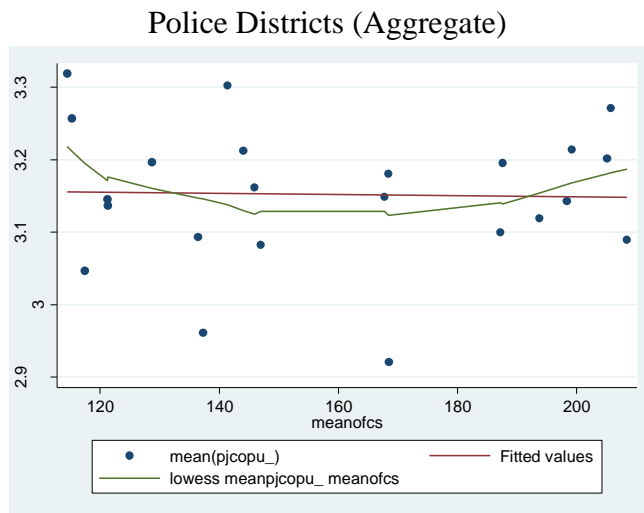
- (1) Showed a lot of concern
- (2) Showed some concern
- (3) Showed little concern
- (4) Showed no concern

Appendix C: Pathways to Desistance Police Procedural Justice: Vicarious Experience

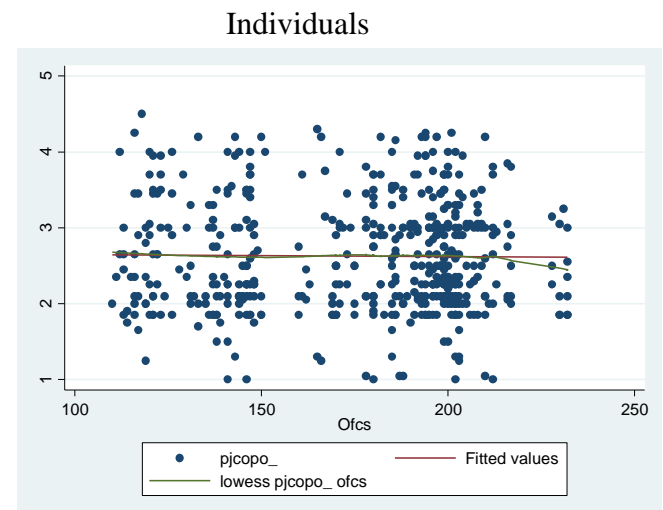
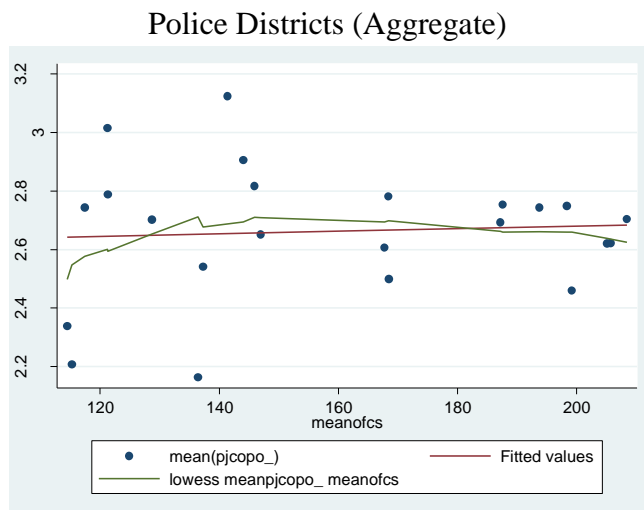
1. Of the people you know who have had a contact with the police (in terms of crime accusation), how much of their story did the police let them tell?  
[Reverse coded] [Converted to 5 pt. Likert scale]
  - (1) All of it
  - (2) Most of it
  - (3) Some of it
  - (4) None of it
2. Police treat males and females differently. [Reverse coded]
  - (1) Strongly disagree
  - (2) Disagree
  - (3) Neither agree nor disagree
  - (4) Agree
  - (5) Strongly agree
3. Police treat people differently depending how old they are. [Reverse coded]
  - (1) Strongly disagree
  - (2) Disagree
  - (3) Neither agree nor disagree
  - (4) Agree
  - (5) Strongly agree
4. Police treat people differently depending on their race/ethnic group. [Reverse coded]
  - (1) Strongly disagree
  - (2) Disagree
  - (3) Neither agree nor disagree
  - (4) Agree
  - (5) Strongly agree
5. Police treat people differently depending on the neighborhoods they are from. [Reverse coded]
  - (1) Strongly disagree
  - (2) Disagree
  - (3) Neither agree nor disagree
  - (4) Agree
  - (5) Strongly agree

## Appendix D: Procedural Justice and Police Scatterplots

### Personal Experience x Total Number of Officers

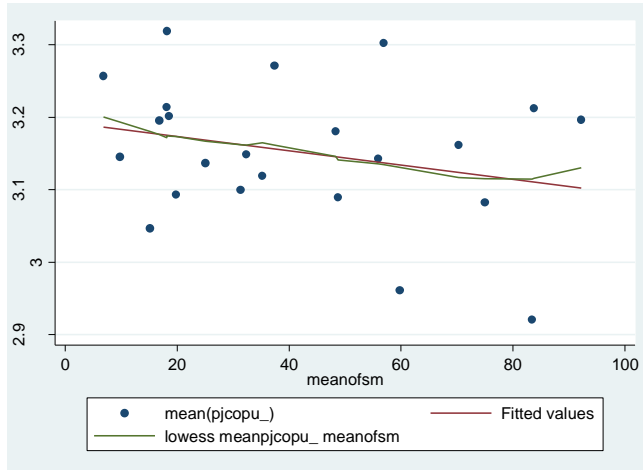


### Vicarious Experience x Total Number of Officers

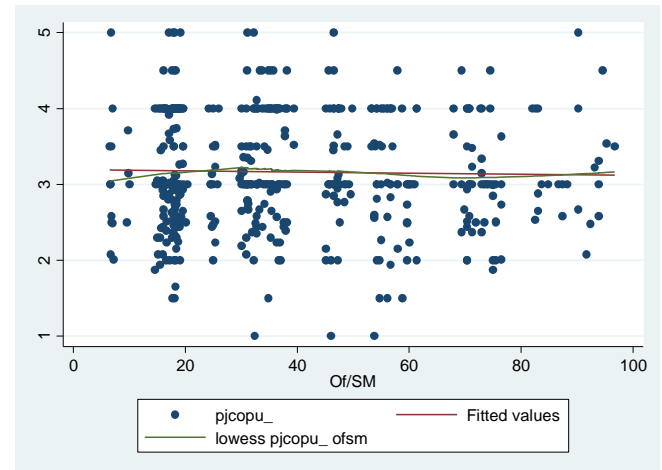


## Personal Experience x Officers per Square Mile

Police Districts (Aggregate)

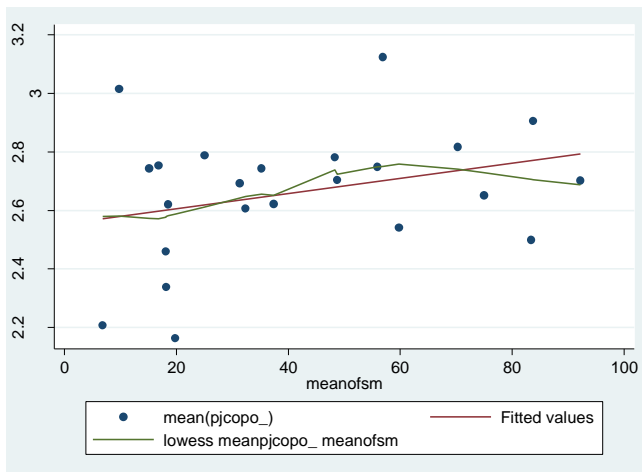


Individuals

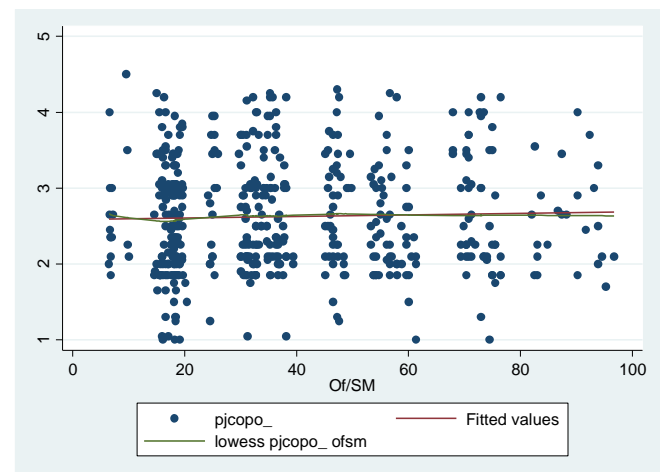


## Vicarious Experience x Officers per Square Mile

Police Districts (Aggregate)

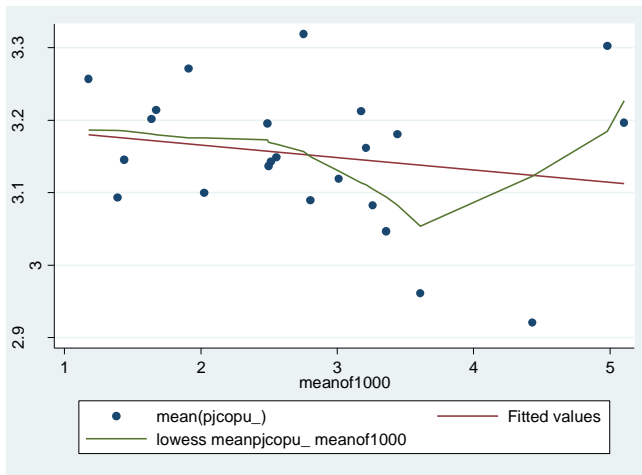


Individuals

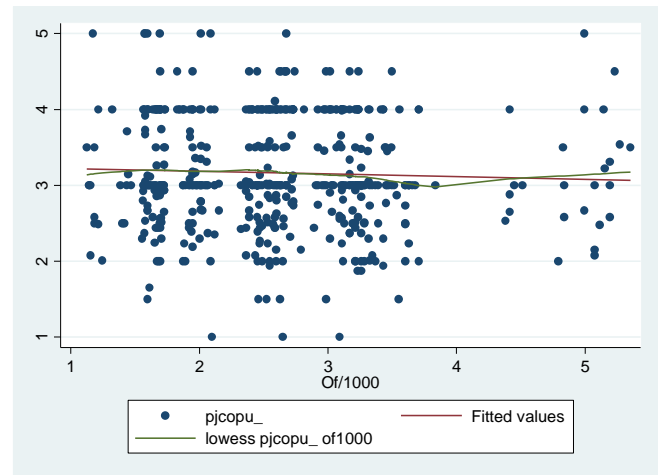


## Personal Experience x Officers per 1,000 Population

Police Districts (Aggregate)

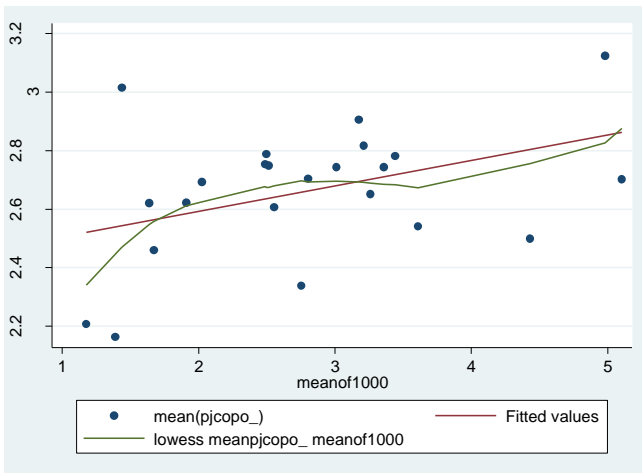


Individuals

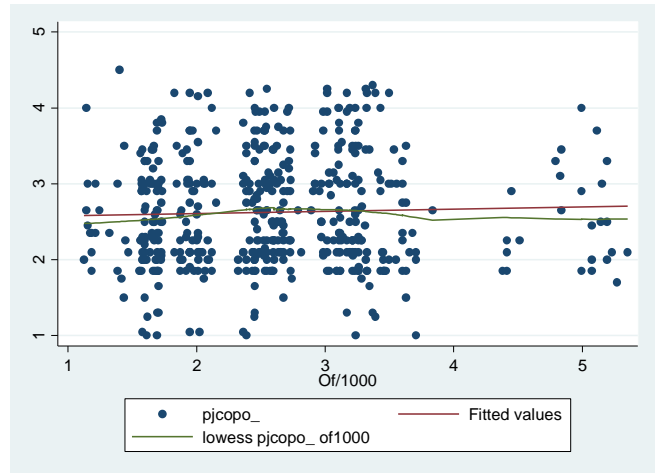


## Vicarious Experience x Officers per 1,000 Population

Police Districts (Aggregate)



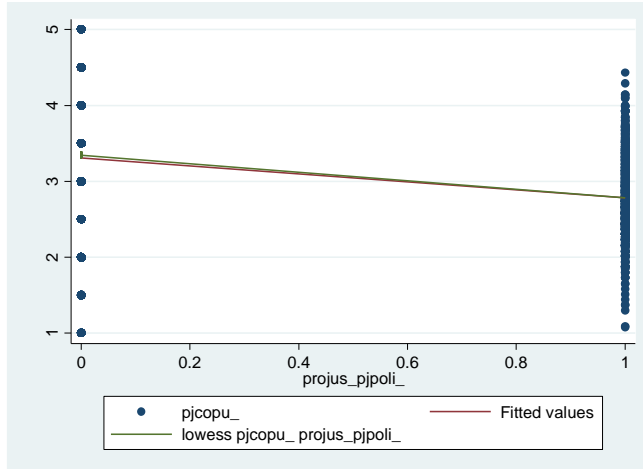
Individuals



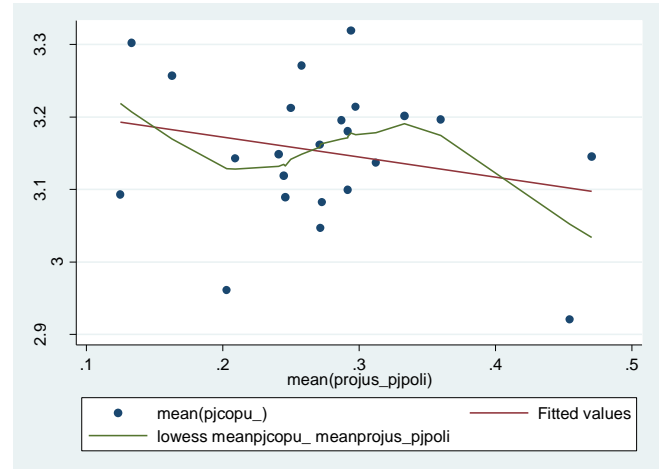


Personal Experience x If Police Picked You up and Accused You of Something (in recall time)

Police Districts (Aggregate)

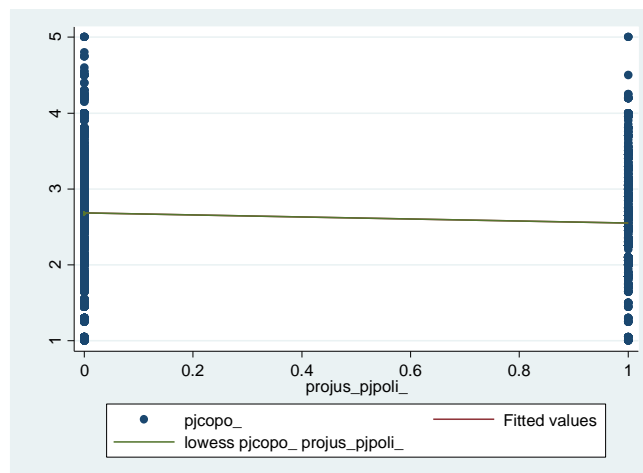


Individuals

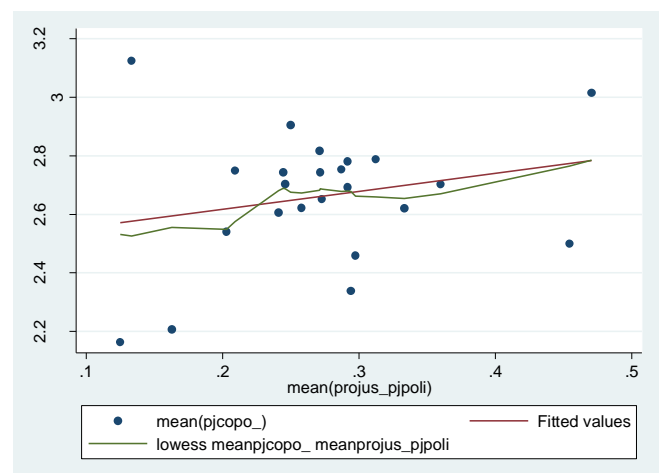


Vicarious Experience x If Police Picked You up and Accused You of Something (in recall time)

Police Districts (Aggregate)

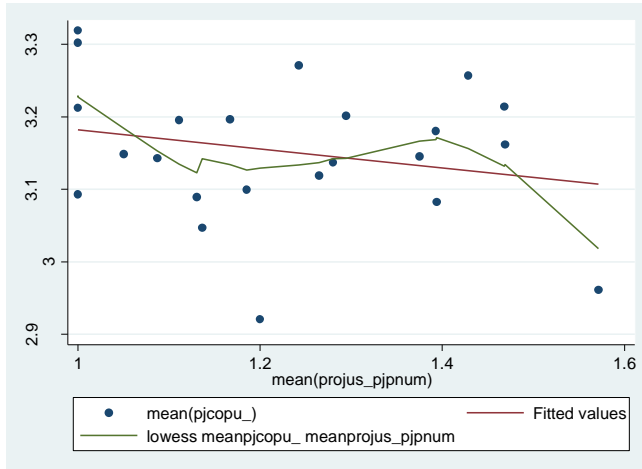


Individuals

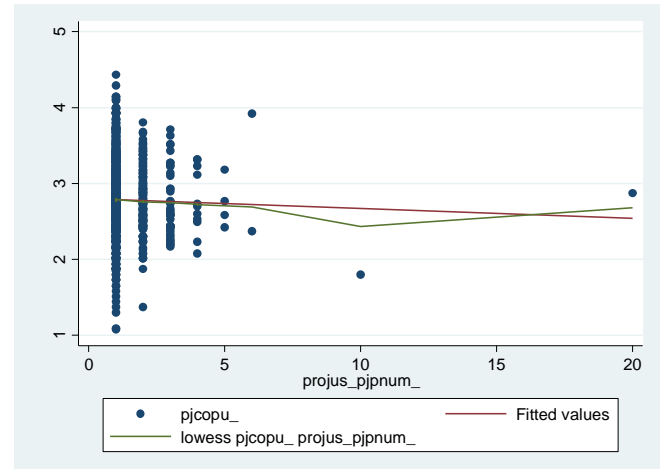


## Personal Experience x Number of Times Police Picked You up and Accused You of Something

Police Districts (Aggregate)

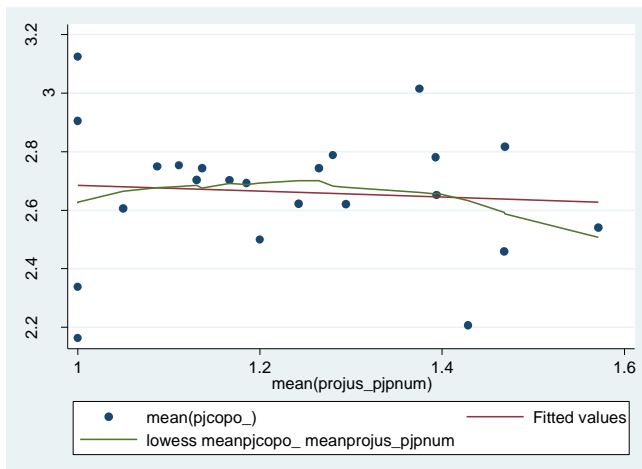


Individuals

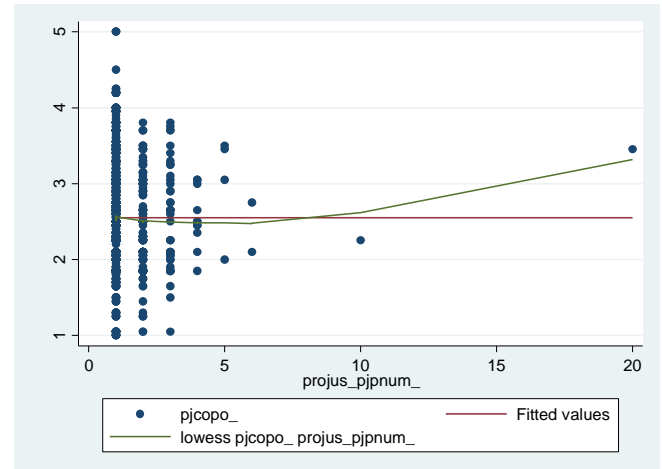


## Personal Experience x Number of Times Police Picked You up and Accused You of Something

Police Districts (Aggregate)



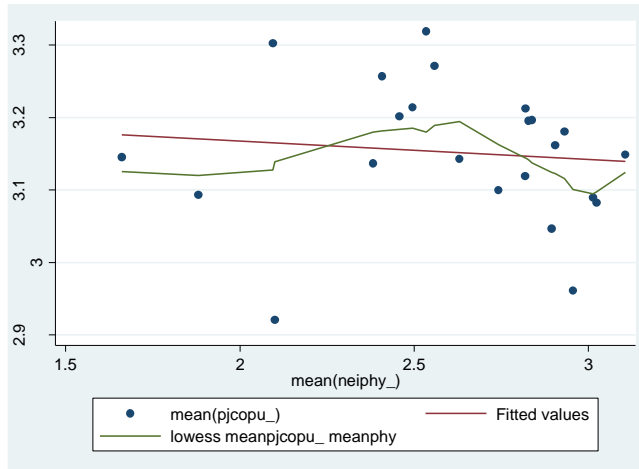
Individuals



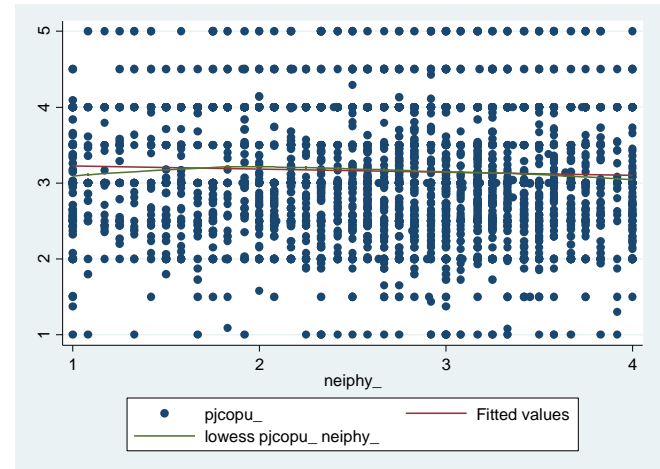
*Appendix E: Procedural Justice and Neighborhood/District Variables Scatterplots*

Personal Experience x Neighborhood Physical Disorder

Police Districts (Aggregate)

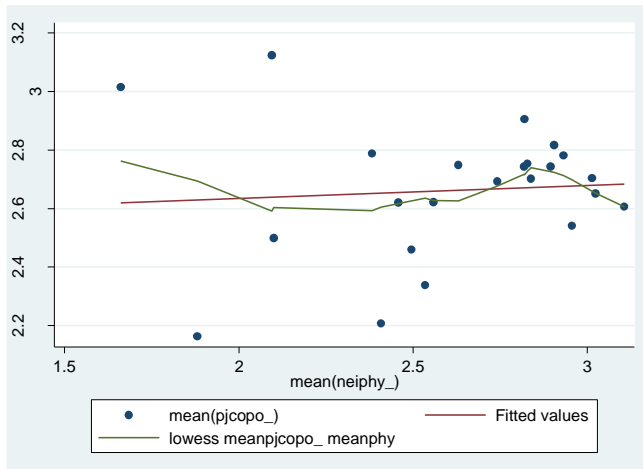


Individuals

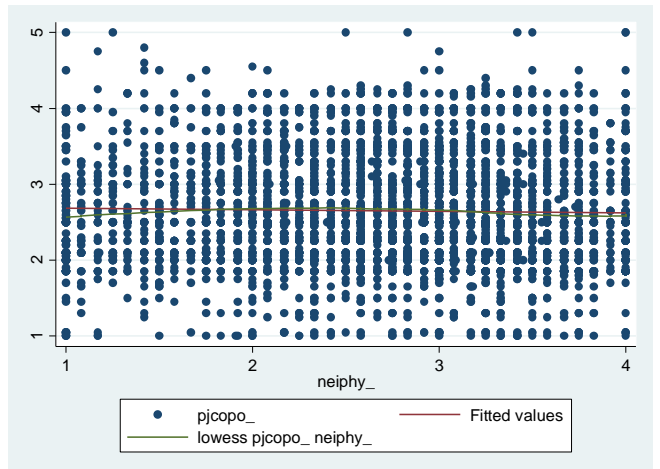


Vicarious Experience x Neighborhood Physical Disorder

Police Districts (Aggregate)

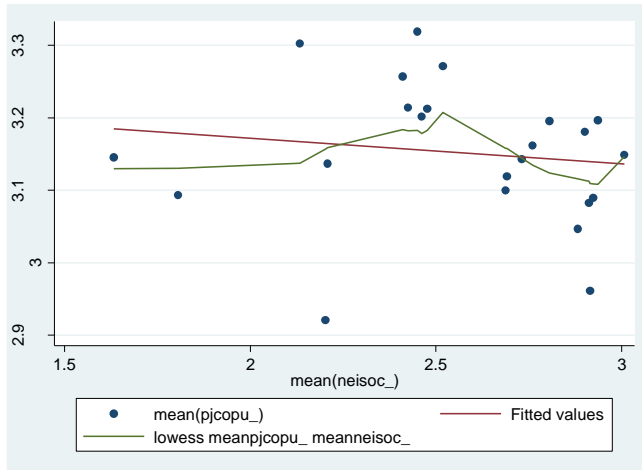


Individuals

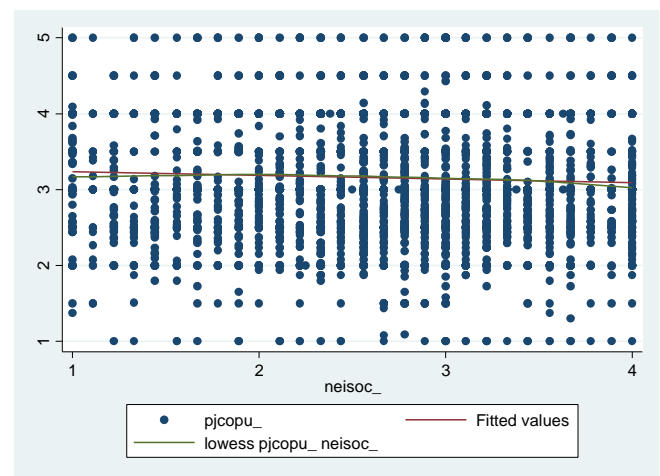


## Personal Experience x Neighborhood Social Disorder

Police Districts (Aggregate)

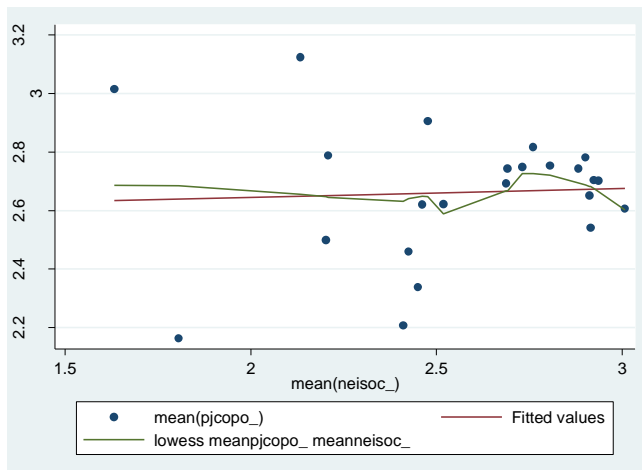


Individuals

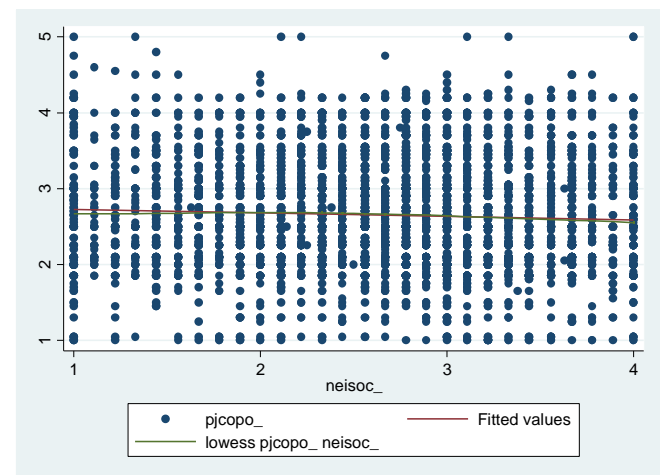


## Vicarious Experience x Neighborhood Social Disorder

Police Districts (Aggregate)

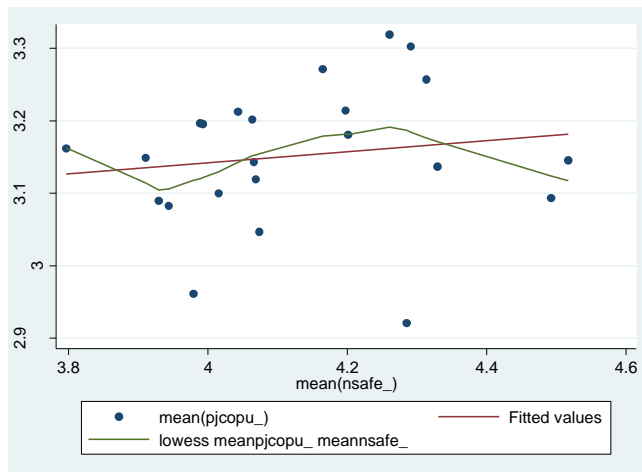


Individuals

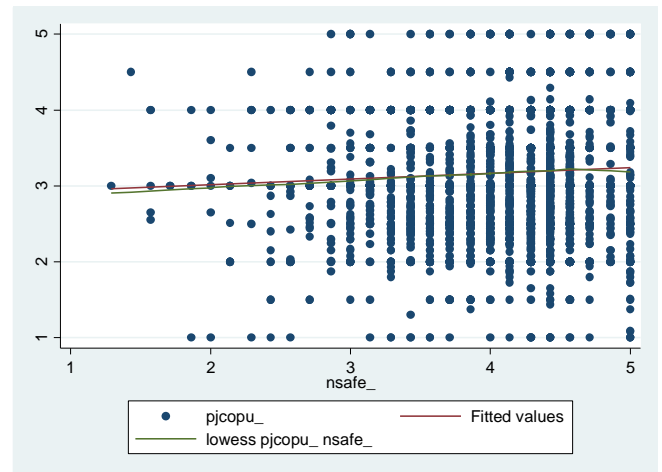


## Personal Experience x Neighborhood Safety

### Police Districts (Aggregate)

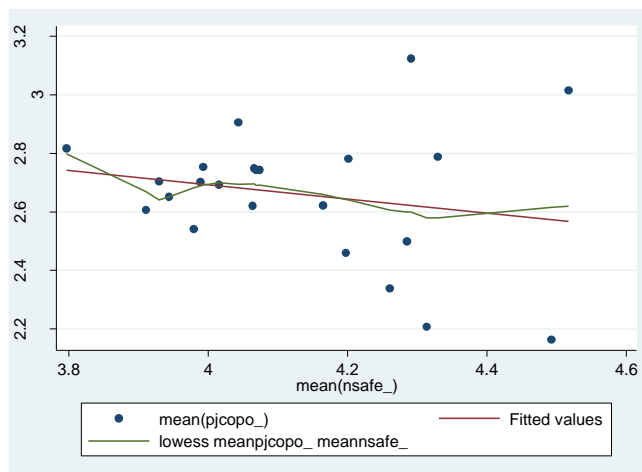


### Individuals

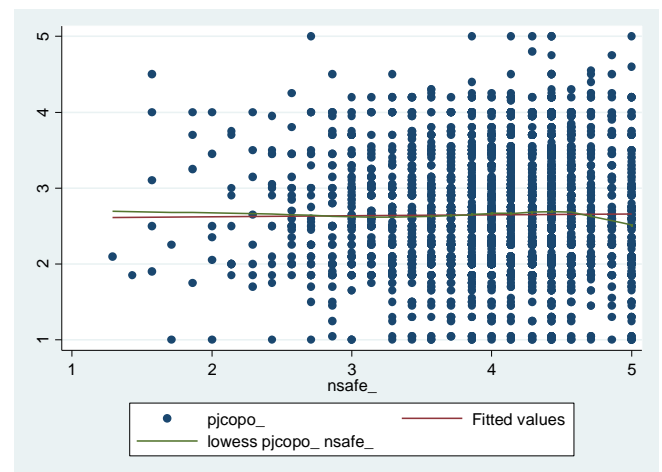


## Vicarious Experience x Neighborhood Safety

### Police Districts (Aggregate)

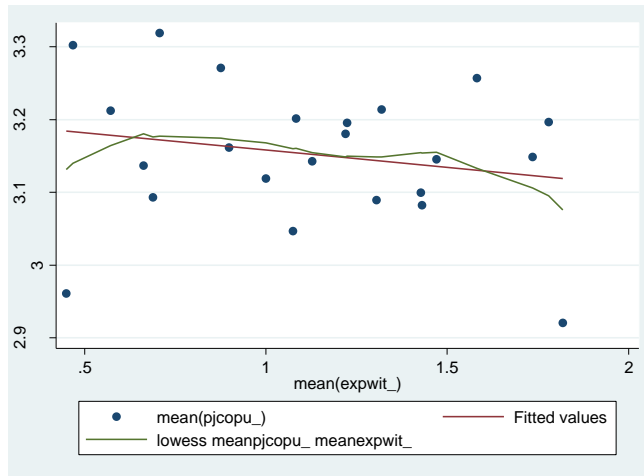


### Individuals

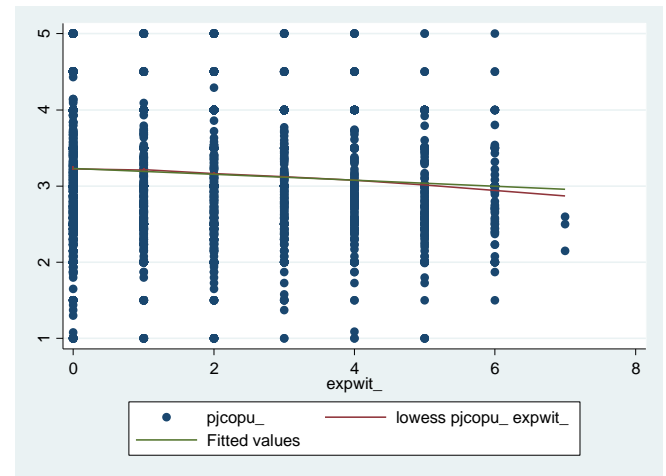


## Personal Experience x Exposure to Violence (Witness)

### Police Districts (Aggregate)

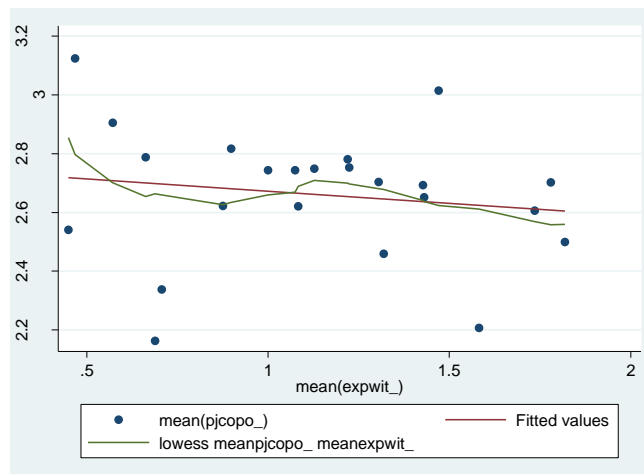


### Individuals

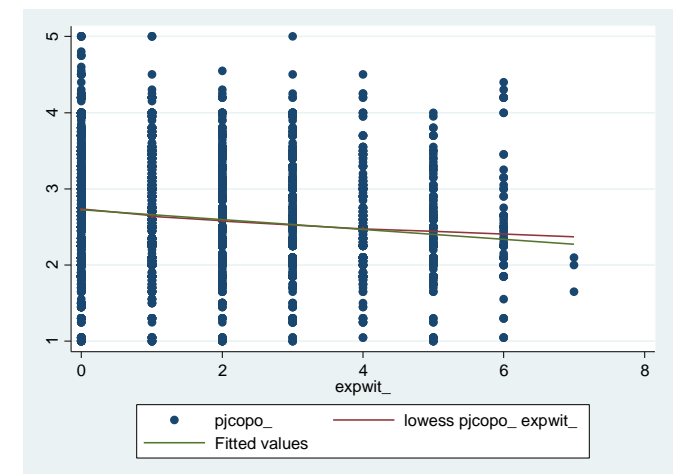


## Vicarious Experience x Exposure to Violence (Witness)

### Police Districts (Aggregate)

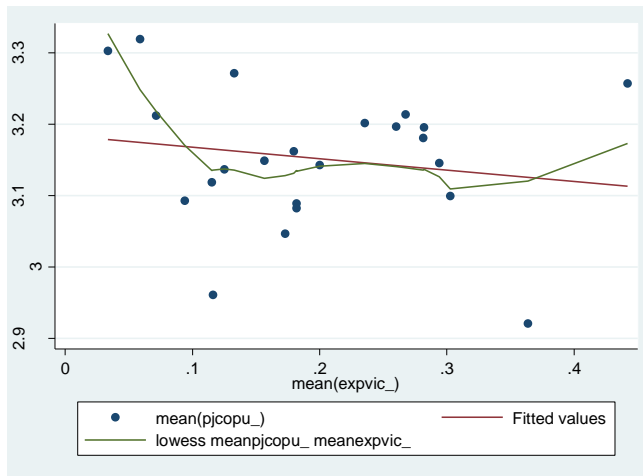


### Individuals

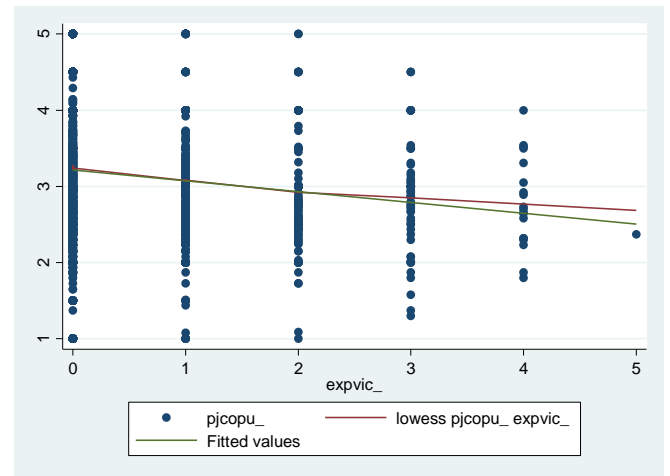


## Personal Experience x Exposure to Violence (Victim)

### Police Districts (Aggregate)

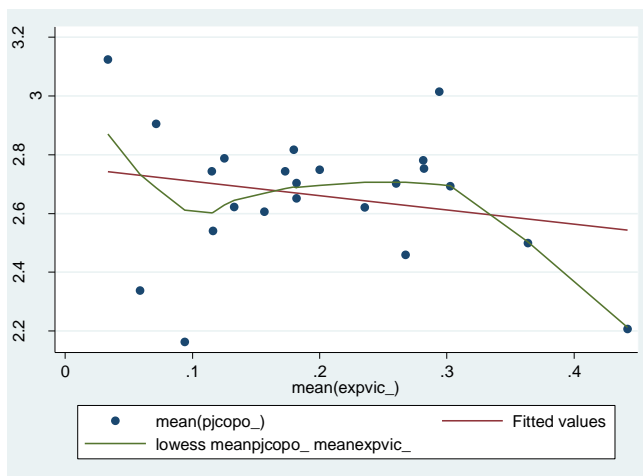


### Individuals

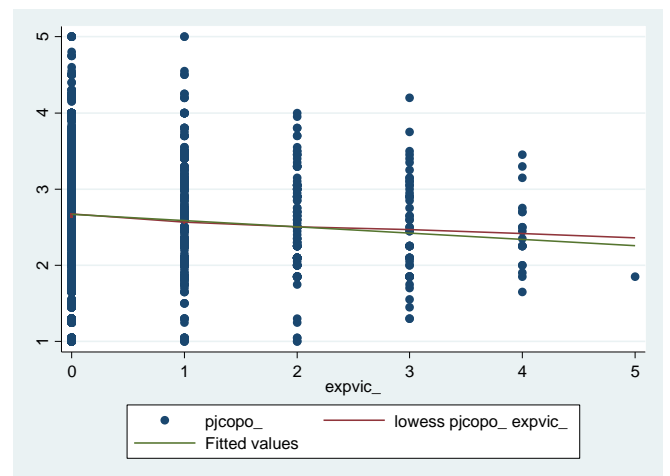


## Vicarious Experience x Exposure to Violence (Victim)

### Police Districts (Aggregate)

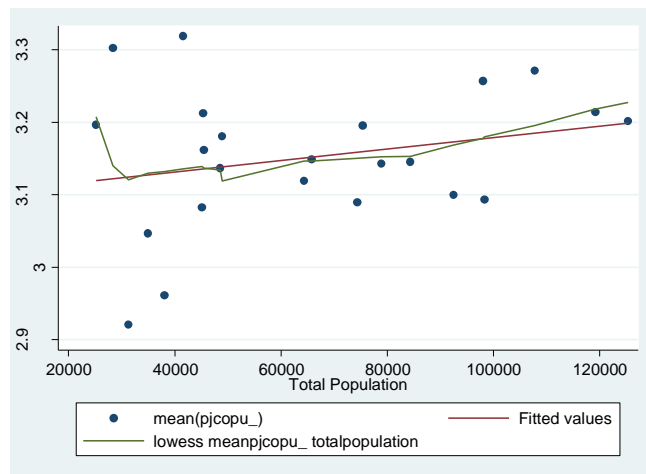


### Individuals

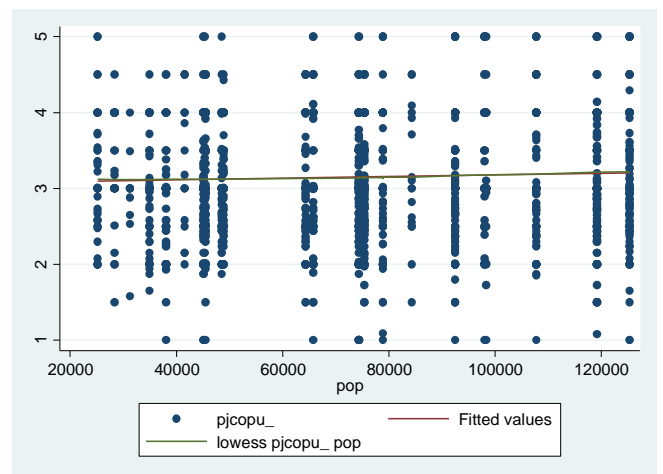


## Personal Experience x Total Population

### Police Districts (Aggregate)

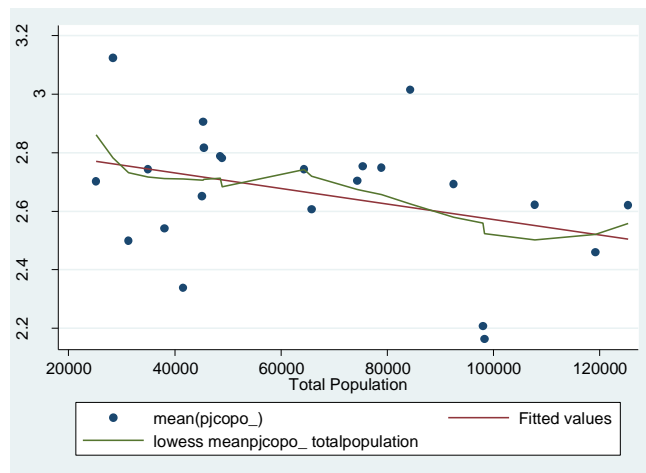


### Individuals

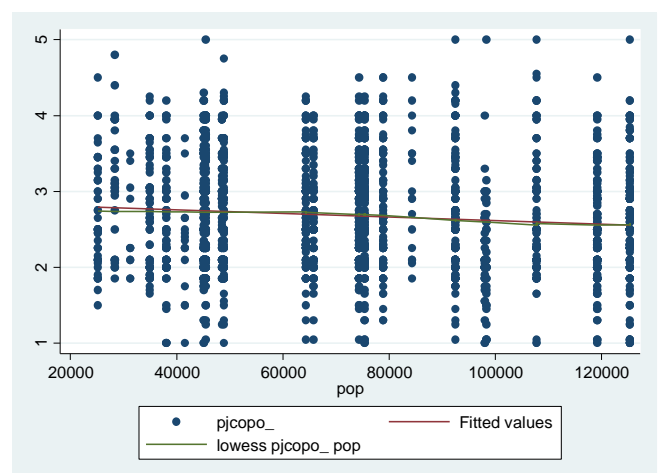


## Vicarious Experience x Total Population

### Police Districts (Aggregate)



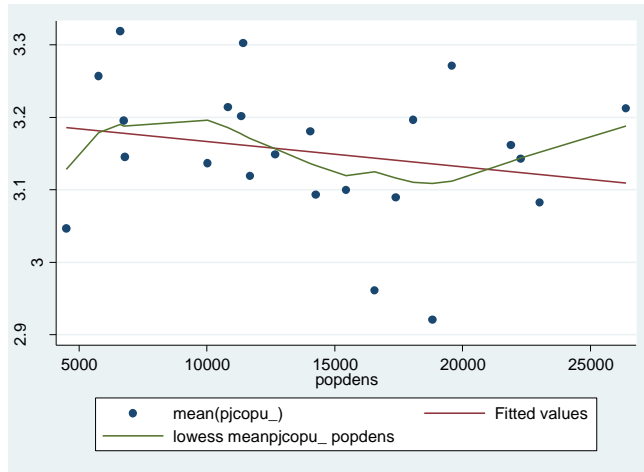
### Individuals



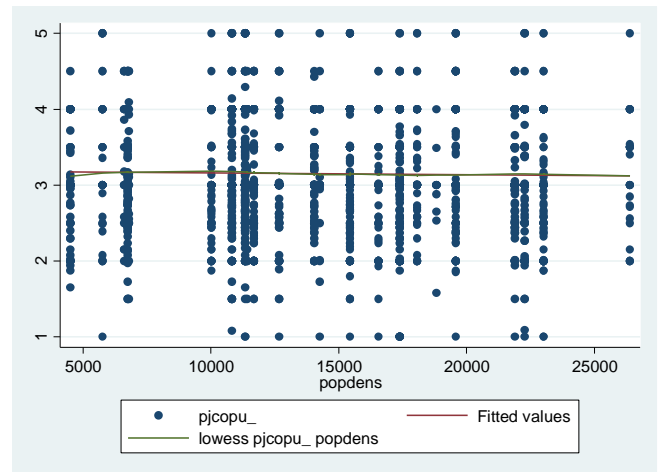


## Personal Experience x Population Density

### Police Districts (Aggregate)

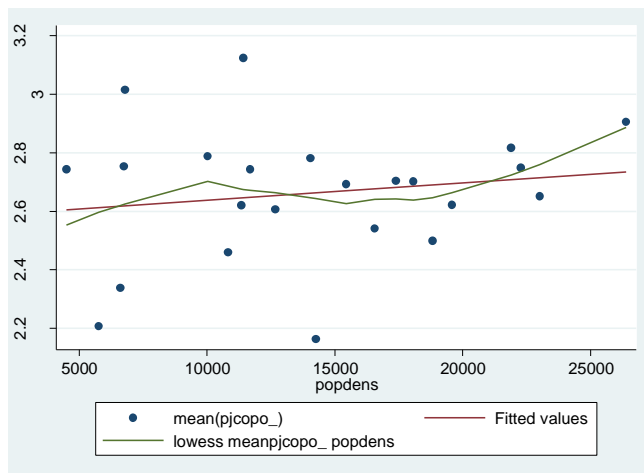


### Individuals

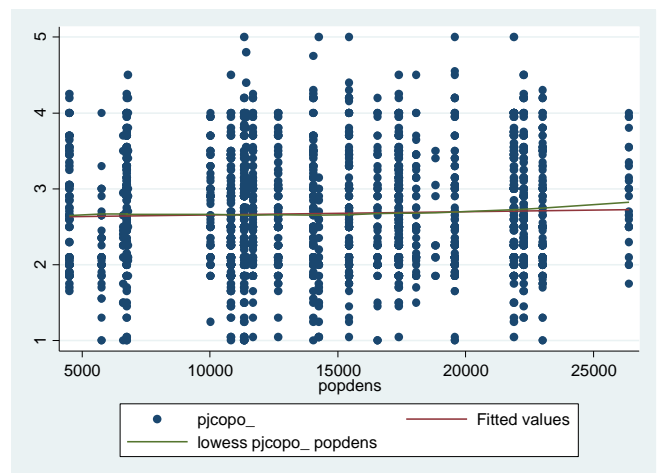


## Vicarious Experience x Population Density

### Police Districts (Aggregate)

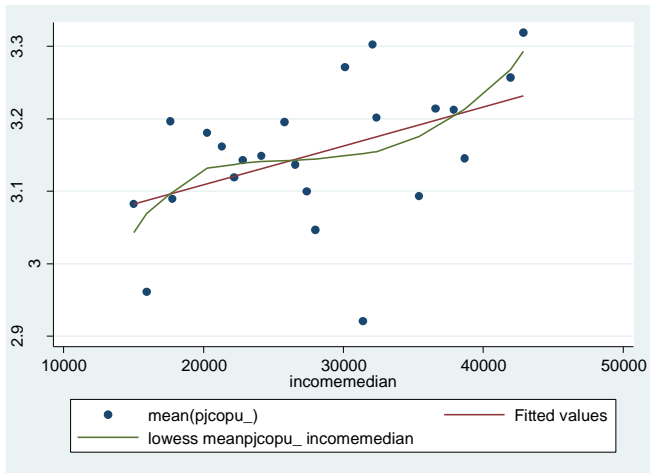


### Individuals

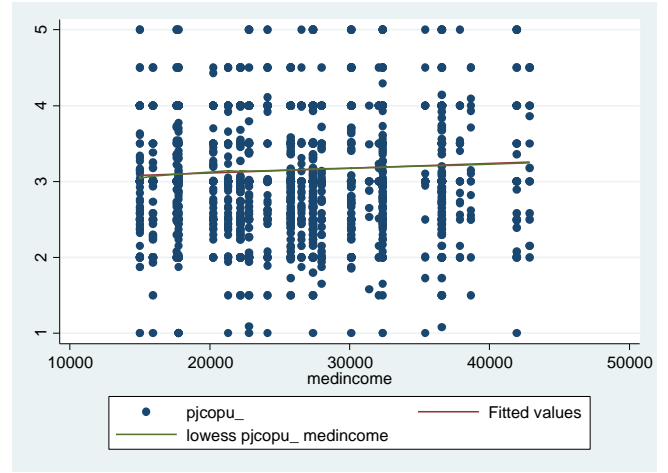


## Personal Experience x Median Income

### Police Districts (Aggregate)

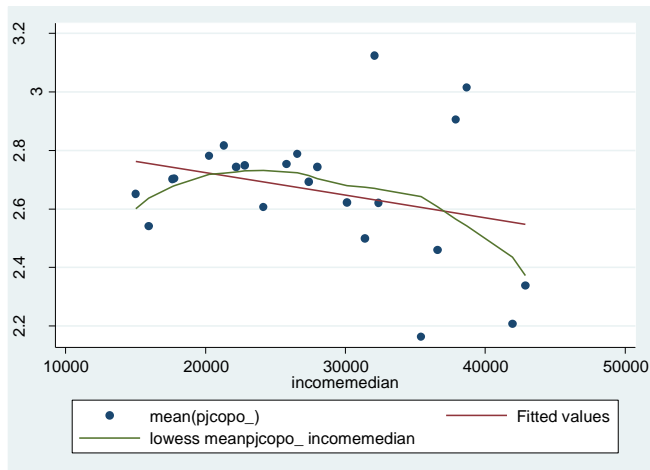


### Individuals

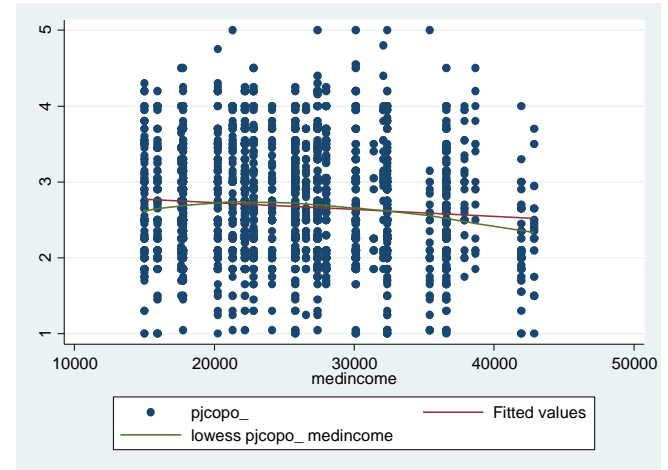


## Vicarious Experience x Median Income

### Police Districts (Aggregate)

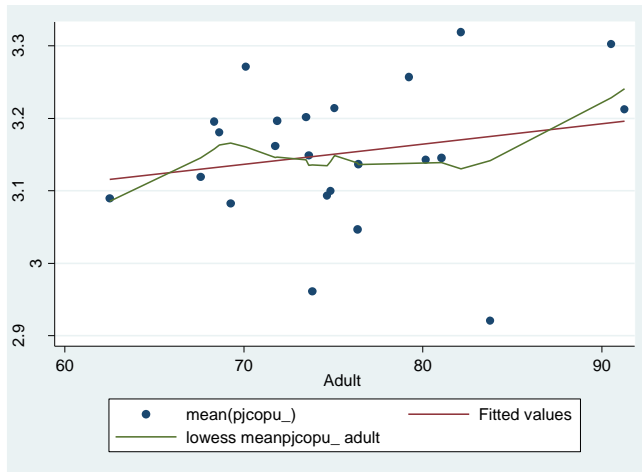


### Individuals

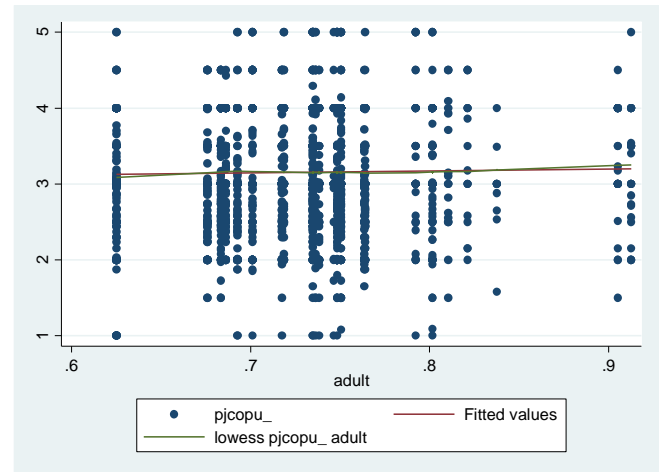


## Personal Experience x Proportion Adult

### Police Districts (Aggregate)

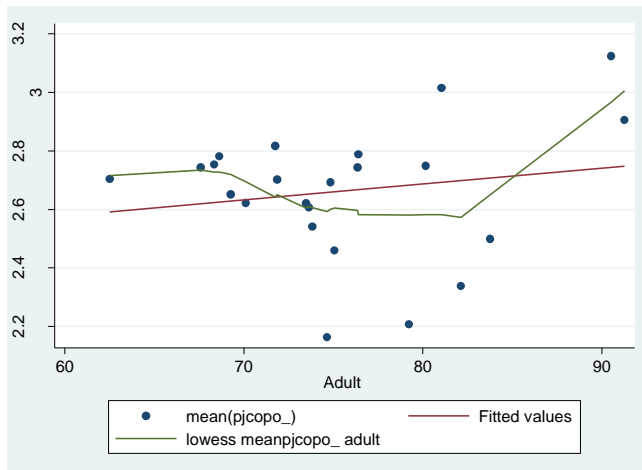


### Individuals

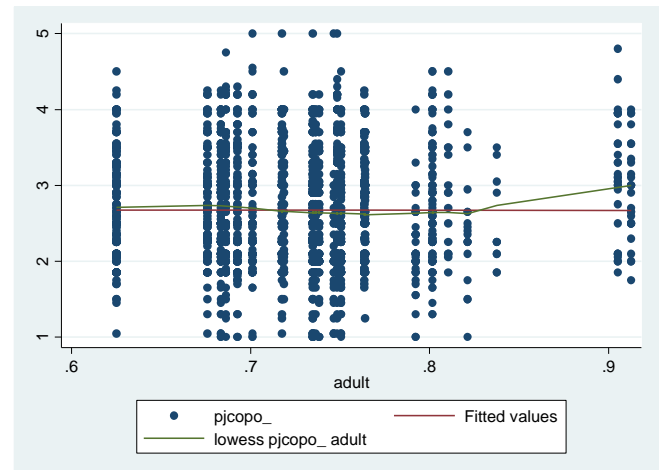


## Vicarious Experience x Proportion Adult

### Police Districts (Aggregate)

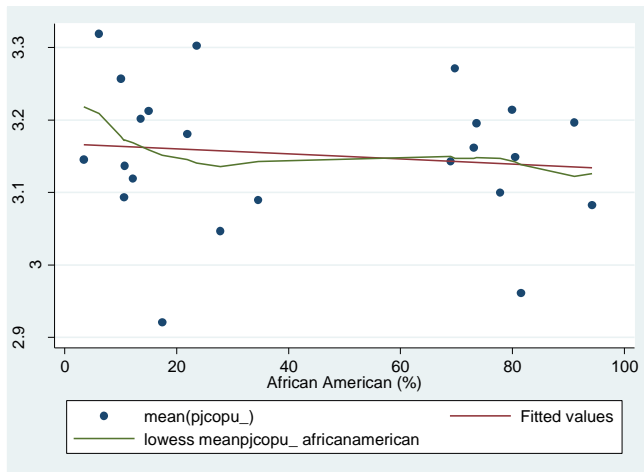


### Individuals

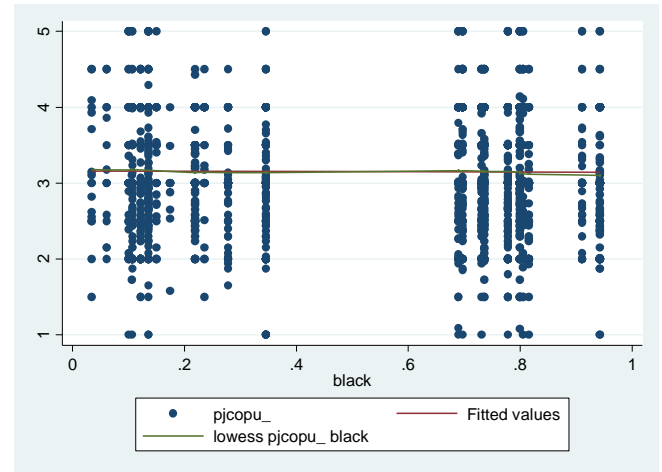


## Personal Experience x Proportion Black

Police Districts (Aggregate)

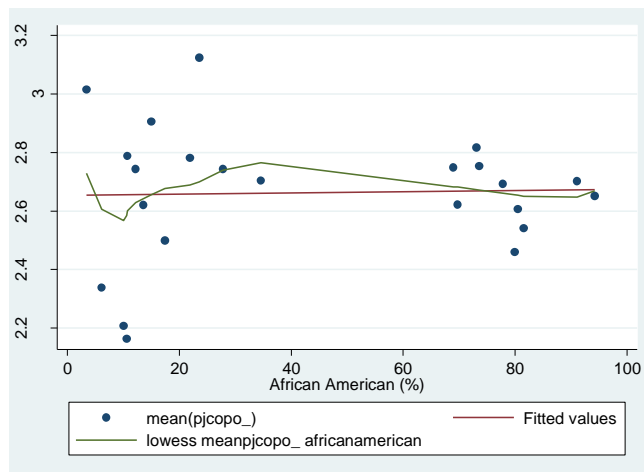


Individuals

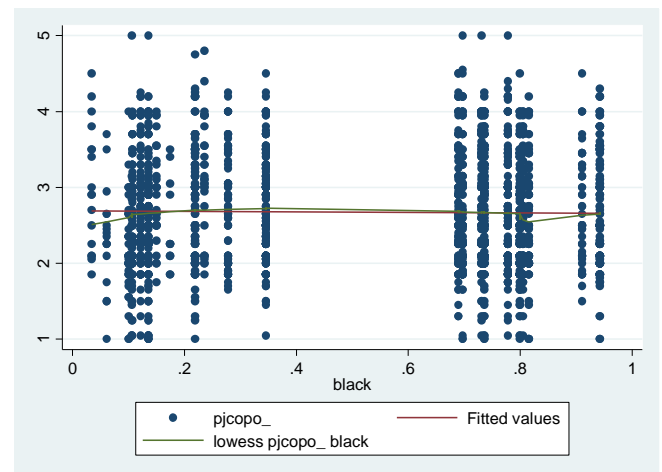


## Vicarious Experience x Proportion Black

Police Districts (Aggregate)

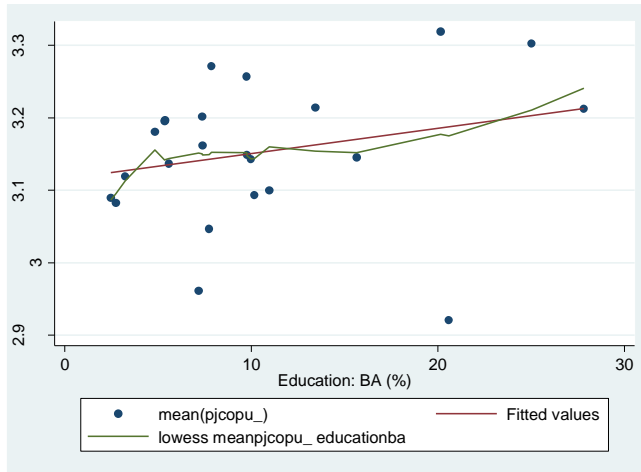


Individuals

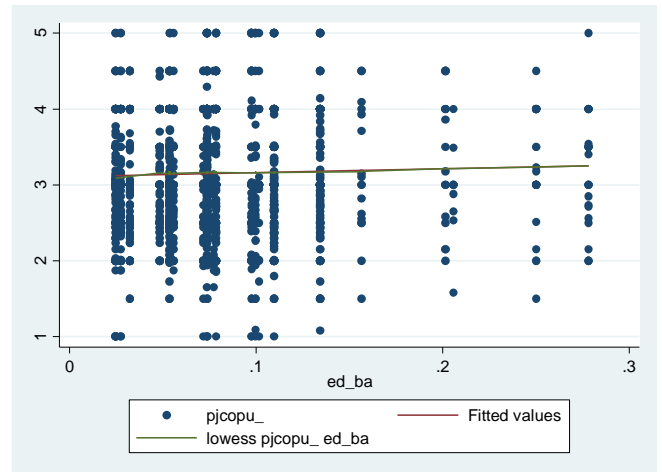


## Personal Experience x Proportion with a BA

### Police Districts (Aggregate)

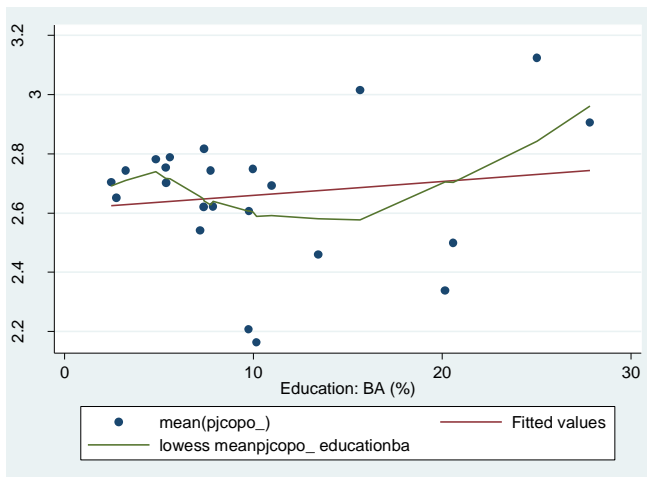


### Individuals

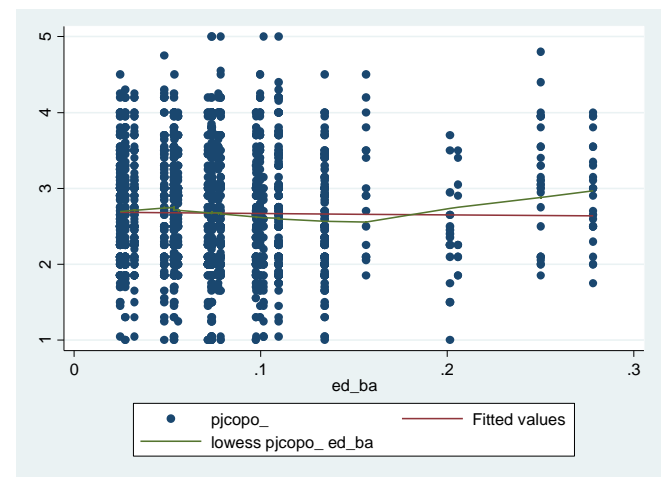


## Vicarious Experience x Proportion with a BA

### Police Districts (Aggregate)



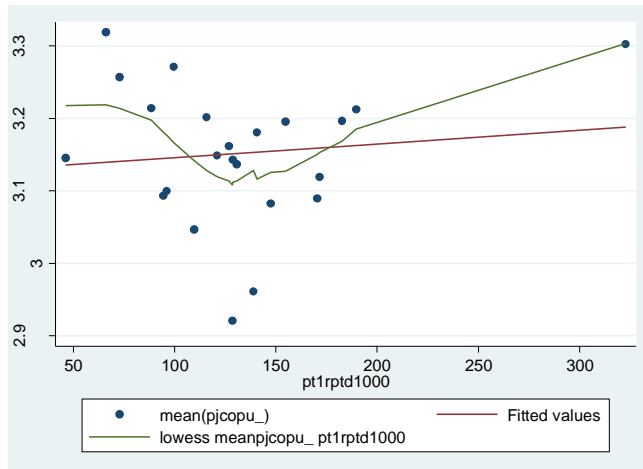
### Individuals



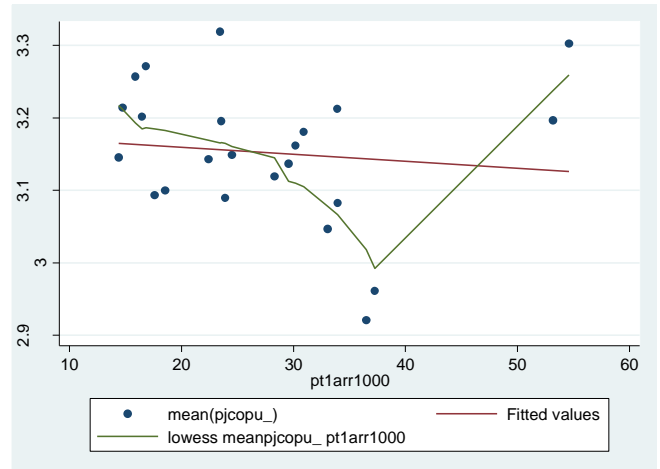
## Appendix F: Procedural Justice and Crimes Reported/Arrests Scatterplots

### Personal Experience x Part I Crimes/1,000 Population

Crimes Reported

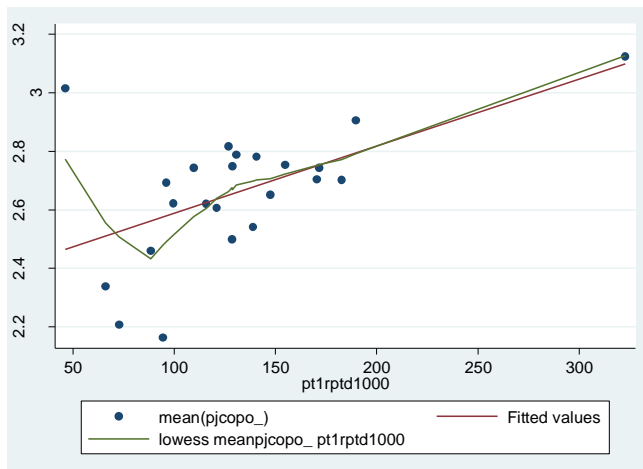


Arrests

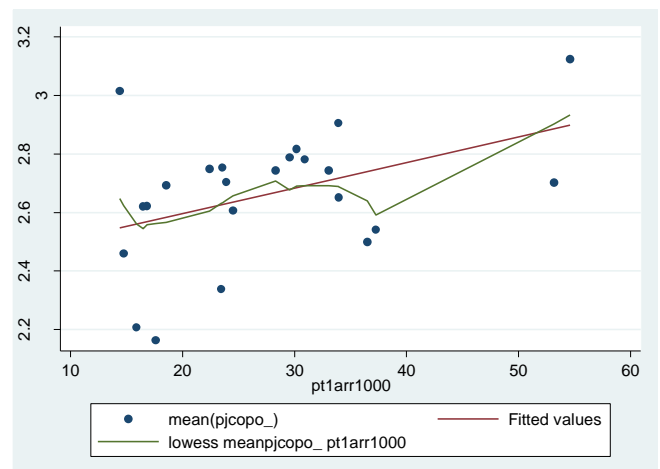


### Vicarious Experience x Part I Crimes/1,000 Population

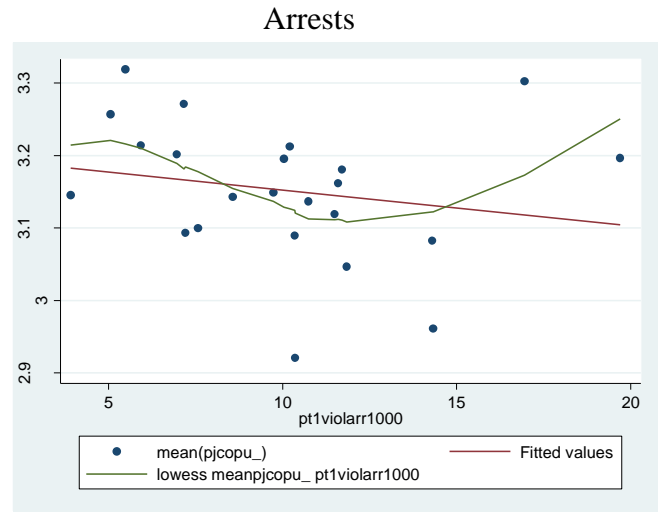
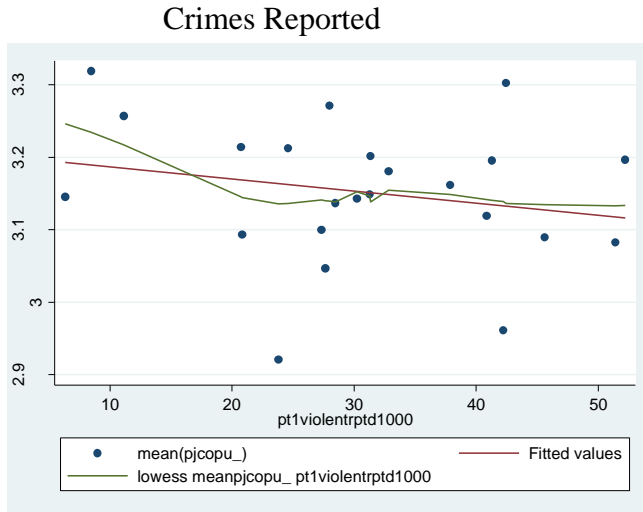
Crimes Reported



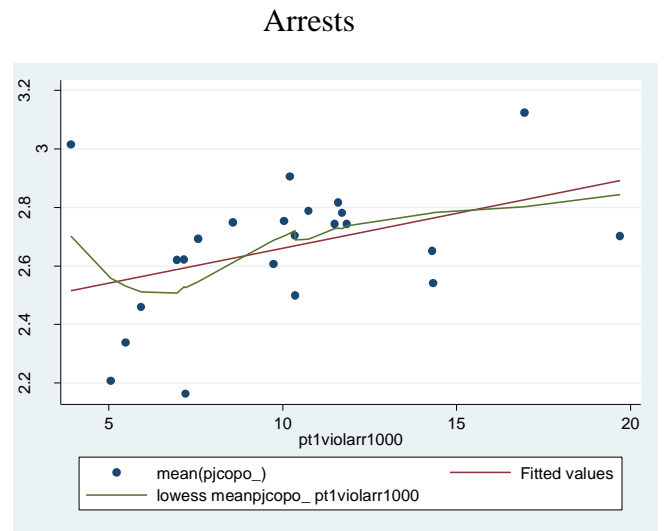
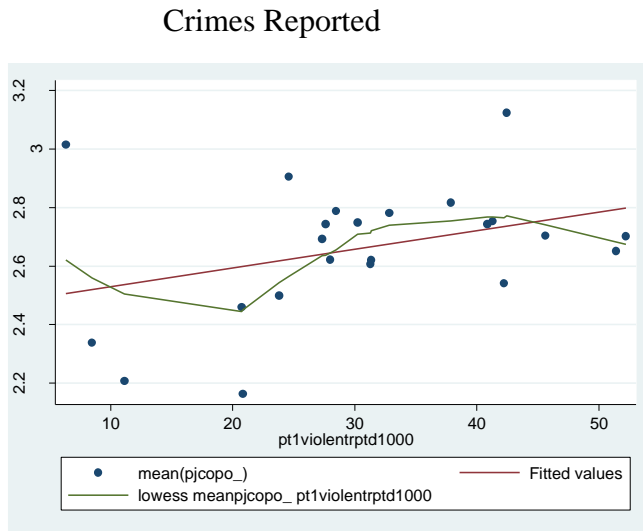
Arrests



## Personal Experience x Part I Violent Crimes/1,000 Population

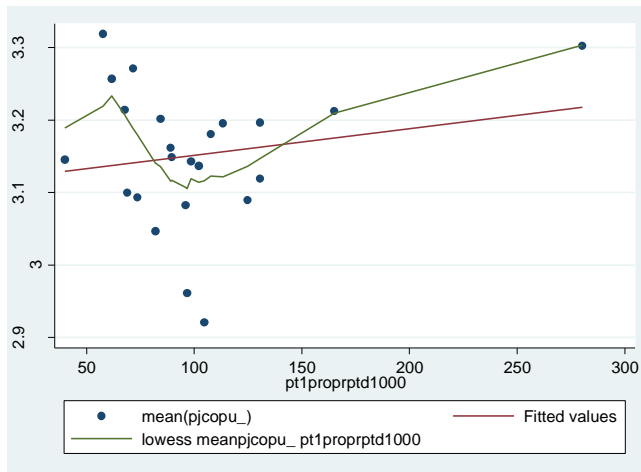


## Vicarious Experience x Part I Violent Crimes/1,000 Population

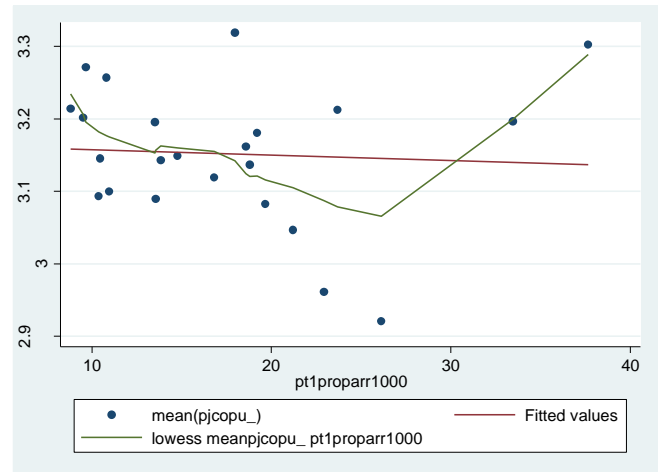


## Personal Experience x Part I Property Crimes/1,000 Population

### Crimes Reported

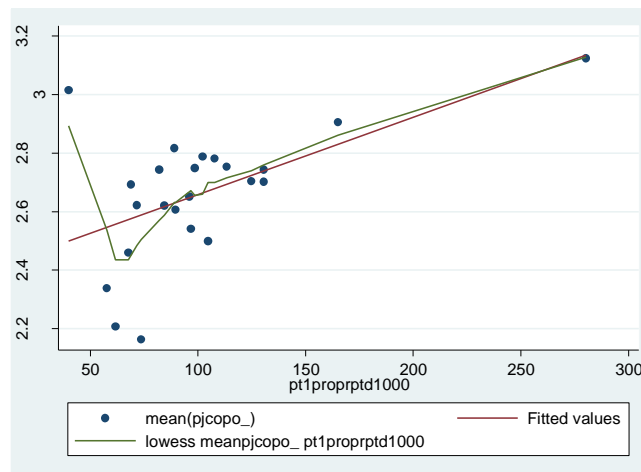


### Arrests

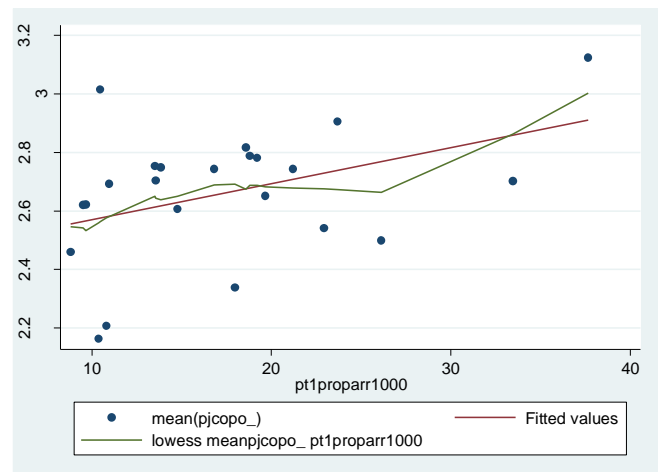


## Vicarious Experience x Part I Property Crimes/1,000 Population

### Crimes Reported



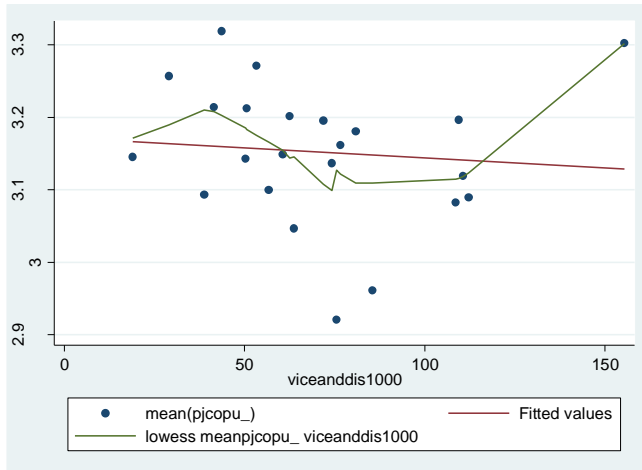
### Arrests



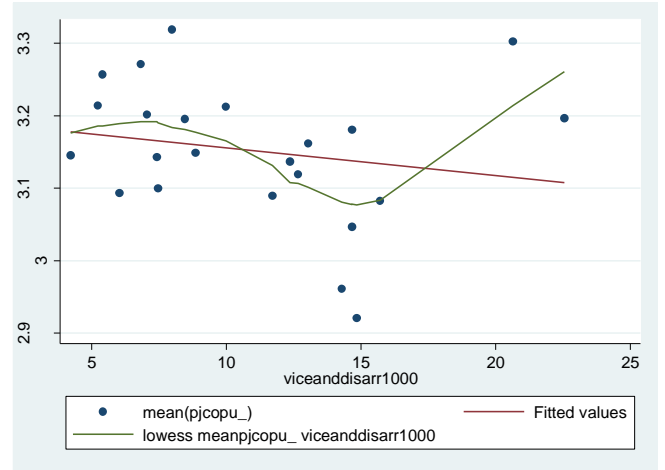


## Personal Experience x Vice and Disorder Crimes/1,000 Population

### Crimes Reported

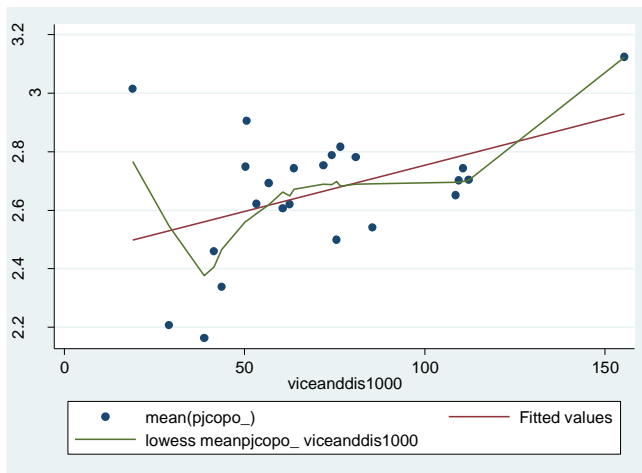


### Arrests

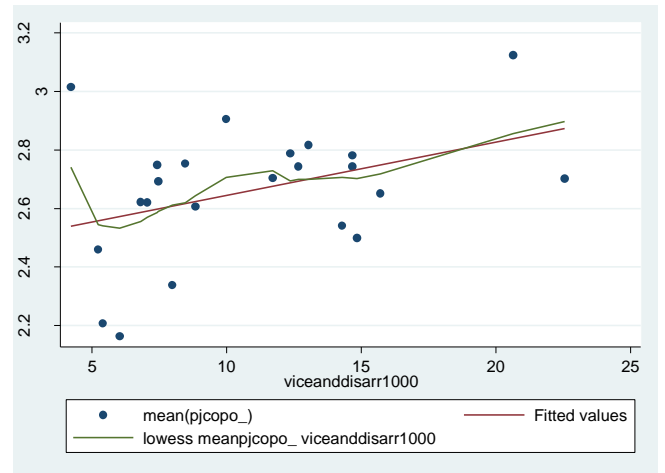


## Vicarious Experience x Vice and Disorder Crimes/1,000 Population

### Crimes Reported



### Arrests



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