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Abstract

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Keywords

Clark University, Mosakowski Institute, Community violence assessment, practitioner-academic partnership, early childhood trauma, action research

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Title Page

Problem Analysis in Community Violence Assessments: Revealing Early Childhood Trauma as a Driver of Youth and Gang Violence

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Abstract

Problem analysis conducted by a university-based research partner can provide communities with data-driven options to address the local drivers of serious youth and gang violence. Situated in Worcester, Massachusetts, this article describes how after early childhood trauma was identified as a potential driver of adolescent and young adult violence, problem analysis using local data confirmed that being the victim or witness of a traumatic incident before the age of 12 was significantly correlated with involvement in violence in adolescence or young adulthood. While there is a robust literature on the relationship between early childhood trauma and later delinquency, local decision-makers did not consider this knowledge actionable until the research partner used the city's own police records to demonstrate the extent of the problem in the city. Rigorous problem analysis, conducted collaboratively between practitioners and an academic research partner, helped to compel local change and ensured that strategies addressed the right risk factors and directed service to the appropriate target population.

Keywords

Community violence assessment; problem analysis; practitioner-academic partnership; early childhood trauma; action research

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Introduction

Youth violence—including gang-related violence—is a pressing public health concern for cities across the United States. According to the Centers for Disease Control and Prevention, in 2014 homicide was the third leading cause of death among youth aged 10–24 years old and violence was a major cause of nonfatal injuries among youth. In 2014, a total of 431,264 young people aged 10–24 years were treated and released from emergency departments for nonfatal injuries sustained from assaults. The 2015 Youth Risk Behavior Survey revealed that among youth in grades 9-12, 22.6% reported being in a physical fight in the 12 months preceding the survey and 16.2% reported carrying a weapon (gun, knife or club) on one or more days in the 30 days preceding the survey. The CDC estimated that each year youth homicides and assault-related injuries result in an estimated \$16 billion in medical and work loss costs (CDC Datasheet, 2012). Although difficult to track definitively, the FBI estimates that 13% of the nation’s homicides are gang related. Because the causes of youth violence are multi-faceted and complex, there is growing recognition that relying on law enforcement and suppression alone is an inadequate response to this public health problem.

The Comprehensive Gang Model (CGM) is a multi-sector, collaborative approach that can address the numerous risk factors that contribute to gang and youth violence in a community (Gebo, Bond, & Campos, 2015; Spergel 1995). The CGM, as a framework and not a prescribed program, responds to a community’s particular risk factors by strategically directing intervention, opportunity provision, and suppression resources toward gang-involved and high-risk youth while mobilizing the community and increasing organizational capacity through training, policy, and procedure change. The CGM has been shown to decrease gang-related robberies and reduce levels of violent crime and drug arrests among gang members (McGarrell et

al., 2012). Yet due to the complexity of the CGM, many communities have faced implementation challenges that have weakened its effectiveness (Gebo, Bond & Campos, 2015; Howell, 2012).

Implementation challenges can occur when communities adopt the CGM without first conducting a comprehensive and methodically rigorous analysis of their youth and gang violence problem (Braga & Hureau, 2012; Braga, McDevitt, & Pierce, 2006; Gebo, Bond & Campos, 2015; Howell, 2010). Absent a thorough assessment, communities are unable to identify the appropriate target population for prevention, intervention and suppression strategies and may not understand organizational factors that are inadvertently contributing to the gang and youth violence problem. Without pertinent data, communities risk wasting resources on replicating what has been traditionally done, but perhaps has not worked, rather than developing data-driven responses to a community's particular dynamics and risk factors (Braga & Hureau, 2012). The lack of problem analysis also leaves a community without meaningful baseline data to track progress and strategy effectiveness. The Office of Juvenile Justice and Delinquency Prevention produced a detailed guide for a community gang assessment process (OJJDP, 2009); yet, communities may lack the capacity to conduct the rigorous analysis needed to develop a community assessment that can guide strategy development and implementation.

To address this limitation, the field of criminal justice is increasingly moving toward the inclusion of university-based research partners in comprehensive approaches to public safety issues (Braga & Hureau, 2012; Burkhardt, et al., 2015; Rojek, Smith & Alpert, 2012; Worden, McLean, & Bonner, 2014). The inclusion of research partners has been credited with reducing youth gun use (Braga, McDevitt, & Pierce, 2006); assisting police in interactions with individuals with mental illness (Burkhardt et al., 2015); and increasing community understanding of gang presence and activities (Takata & Tyler, 1995). Referred to as 'real time social science,'

the inclusion of academic research partners supports community members and practitioners in a five-phase action research cycle consisting of problem identification, problem analysis, strategy development, assessment of strategy performance, and strategy modification (Braga & Hureau, 2012) (see Figure One).

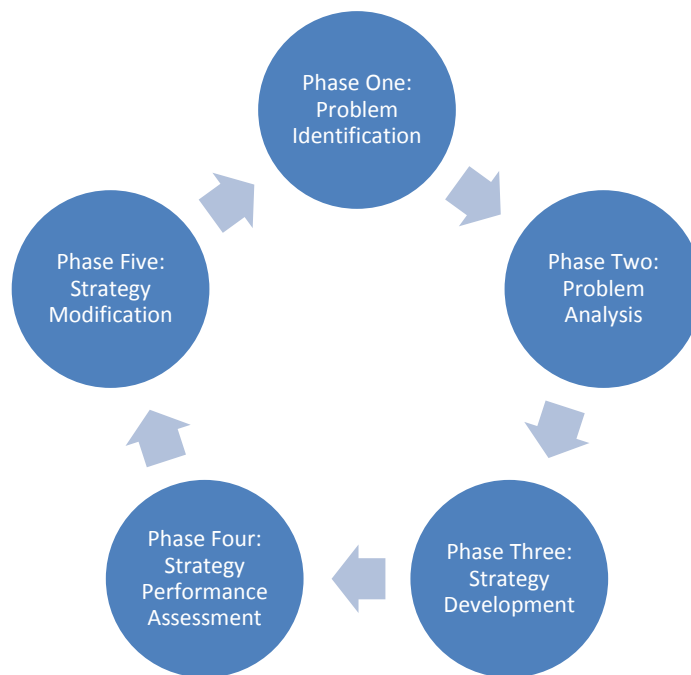


Figure One: Action Research Cycle

Academic research partners are particularly important in the problem analysis phase. Problem analysis involves in-depth, multi-dimensional, systematic assessment of crime problems at the local level, including an examination of underlying factors that lead to crime and disorder in order to develop informed responses (Boba, 2003; Braga, McDevit, & Pierce, 2006). This analysis is necessary to develop relevant and effective strategies; yet, it has been found to be the weakest and most overlooked phase of the action research cycle. Reasons for this are that problem analysis requires different forms of data, knowledge, analysis capacities and skills than traditional crime analysis (Boba, 2003; Santos, 2014). Rigorous and comprehensive problem

analysis is difficult to achieve if police cannot build these capacities internally and/or lack partnerships with external researchers.

This article features a Worcester, MA initiative based on the CGM called Project Sure Steps and this initiative's problem analysis phase in its comprehensive community violence assessment. During the problem identification phase, early childhood trauma was identified as a potential risk factor in the local violence landscape that had previously gone unrecognized. The problem analysis phase revealed dimensions about the relationship between early childhood trauma and later involvement in violence that were critical to motivating local action and developing appropriate strategies. The major conclusions of this article are two-fold. One, rigorous problem analysis—assisted by a research partner—is needed for effective strategy development. Two, problem analysis using local data can catalyze new stakeholders and community resources to be directed to youth violence prevention and intervention efforts.

Project Background

Launched in 2006, Project Sure Steps is a multi-sector approach to reduce gang violence, recidivism and retaliation and to increase the education and employment opportunities for high-risk and gang involved youth and young adults. Directed by a police sergeant, the project brings together partners from youth agencies, workforce development providers, mental health organizations, and the schools along with juvenile and criminal justice sectors, and research partners from xxx University.

In 2006, when Project Sure Steps began, the city of Worcester (population over 185,000) had a variety of characteristics that rendered young people vulnerable to gang involvement and violence. Nearly one-third of all youth in Worcester lived in poverty; the percentage was 44% for Hispanic youth. One-third of Worcester households were headed by a single female, and the

four-year graduation rate was lower than that of the state of Massachusetts. Young people ages 16 to 24 were disproportionately affected by unemployment and limited job prospects. They were also disproportionately affected by violence.

In an initial analysis of the city's gang problem, Braga (2006) found that young people were committing a great deal of the violent crime in the city. For example, 38% of arrests for assault and battery, disorderly conduct, distribution and sales of drugs, and firearms related incidents were of young people under age 24. Much of the violent crime was gang related. There were approximately 700-900 gang members in the city, the average age of a gang member was seventeen years old, and gang activity was estimated to be responsible for 43% of homicides and 37% of non-fatal shootings. Black and Latino males were disproportionately the victims and perpetrators of violent and gang crime (Braga, 2006). In this context, Project Sure Steps combined targeted suppression for the most violent offenders, with the provision of case management, street outreach, youth employment, education support, and other engagement opportunities for high risk youth.

Fast forward to 2013. Homicides in Worcester had been in the single digits each year since the project was launched. Gang turf remained limited to 2% of the city, and the pool of gang victims and offenders was relatively small. Worcester's juvenile arrest rate had declined by 40% since 2006. Hundreds of high-risk youth had received workforce development training and employment and many had reconnected with school through Project Sure Steps efforts. Community-based agencies, the schools, and the WPD were sharing information and working together. In spite of these successes, the victims of shootings and homicides continued to be disproportionately Black and Latino men between the ages of 17 and 27. In 2013, although only constituting roughly 20% of the juvenile population, Latino males accounted for 55% of all

juvenile male arrests. We saw that the arrest rate for Latino males rise, as arrests for other juveniles fell.

It was these latter two data points that caused Project Sure Steps leadership great concern. They began to ask why—in spite of six years of programmatic effort—were these patterns in violent crime and juvenile arrest persisting. Project leadership asked the research partner team to take on a comprehensive community assessment of the factors driving youth and gang violence in Worcester. The action research team consisted of two faculty members who are social scientists, a project manager, and master's level graduate students with specializations in youth development, geographic information sciences, econometrics, and community development.

The research team followed procedures recommended by the Office of Juvenile Justice and Delinquency Prevention (2009) to analyze community gang and youth violence problems. We convened a leadership group of key decision-makers including individuals from the schools, the city, business, and the project's advisory committee. The team adopted Howell's (2012) framework to identify Worcester-specific youth violence risk factors across age and ecological domains, including individual, family, school, peer group, and neighborhood/ community.

The assessment drew on available secondary data including the 2010 Census, MA Department of Early and Secondary Education, and the Worcester Community Health Assessment in order to identify unaddressed factors that could potentially be driving violence in Worcester. We examined the police records of 100 young men between 14 and 24 years old who had been identified by the police department as victims or perpetrators of gun or knife violence and referred to a special program to connect these men to employment, education, and behavioral health supports. By reviewing their case records we learned that over 30% of these individuals had their first police contact before the age of 12, the majority of the time as a victim or witness.

At least one-third of these young men were fathers of infants and very young children. This glimpse into the cyclical and generational nature of violence among this group compelled the leadership team to want to know more about the relationship between early trauma and later involvement in violence among Worcester males and what could be done to interrupt this cycle.

Guided by the project's leadership group, the research team assembled these data into a report that was disseminated to community stakeholders including city government, youth serving agencies, parents, and youth for comment. Over the course of four months, the research team organized discussions and community meetings to gain public input into the findings, to prioritize the issues, and to guide strategic planning. Hundreds of residents of all ages deliberated over the findings and potential priorities for action. Public engagement prioritized the issue of early childhood trauma for more in-depth problem analysis.

Methodology

Once community members identified early childhood trauma as a priority area, the research team's problem analysis consisted of a literature review on the relationship between early childhood trauma and later delinquency and a quantitative analysis of a larger police data set. The literature revealed a robust connection between early childhood trauma and later involvement in delinquency including violence; yet, to foster change in community conditions it was important to demonstrate these connections in the local context.

Quantitative analysis was based on an extract from the city's police database consisting of males under the age of 28. The extract included 25,375 males involved in a total of 98,914 incidents. Due to changes that occurred in WPDs data management system, males over the age of 27 were unlikely to have comprehensive records of early childhood experiences. The lead author of this article is CJIS certified to handle law enforcement data. The research team was

able to explore the hypotheses generated in the problem identification phase where the city did not have the capacity to perform this type of analysis internally.

WPD assigned each individual in the dataset a unique numeric code to protect their identities while still allowing tracking of the same individual across incidents and over time. WPD coded individuals based on their role in incidents. The roles included in this analysis were ‘victims’, ‘witnesses’, or ‘arrests.’ Of the individuals in the dataset, 6,790 had ever been arrested, or 26.9%; 11,083 had ever been a victim, or 44%; and 2,526 had ever been a witness, or 9.95% (See Table One). The mean age of the individuals was 22 and the median age was 23. The mean age of first incident was fourteen and the median age of first incident was sixteen.

The main independent variable was witness- and victim-based police contact before the age of 12, which we refer to as *Early Police Contact*. This variable is a proxy for early childhood trauma. An individual was defined as having *Early Police Contact* if they had at least one recorded incident of police contact before the age of twelve where their role was coded as a witness or a victim. This includes incidents such as an ambulance call, assault and battery, assault with a dangerous weapon, injured person, or to check on the welfare of a child. In the dataset, 4,940 individuals, or 19.47% experienced at least one police encounter before age 12 as a witness or victim.

Early Police Contact was tested in multiple models. For the first version of the model *Early Police Contact* was a dummy variable equal to one if the individual was reported as a victim or witness in the police dataset before the age of 12, and zero if they were not. A second model was used to explore differences in the effects of witness- and victim-based trauma. For this purpose *Early Police Contact* was represented by four categorical groups. The first group had a police contact before the age of twelve and was coded as a victim, the second group had a

police contact before the age of 12 and was coded as a witness, and the third group had police contacts before the age of 12 and was coded as both a victim and a witness. Individuals who did not have a police contact before the age of 12 were the fourth group and were used as the base group.

We tested the relationship between *Early Police Contact* and three variables: *Violent Incidents*, *Involved in Violence*, and *Perpetration of Violence*. *Violent Incidents* is a non-negative variable ranging from 0-20 representing the number of violent incidents recorded for an individual after the age of 12 regardless of whether he was the victim, witness, or the alleged perpetrator. This variable was used to test whether individuals who experience childhood trauma were also involved in more violence. The dummy variable *Involved in Violence* is equal to one if the individual was involved in at least one incident of violence over the age of 12, meaning the individual has a value of one or more for *Violence Incidents*. Overall, 8,113 individuals, or 32% of the sample were involved in at least one violent incident over the age of 12. *Perpetration of Violence* is a dummy variable equal to one if an individual has been arrested at least once for a violent incident and zero if they have not.

The correlation between *Early Police Contact* and *Violent Incidents* was tested using a tobit model with a restricted dependent variable to control for the non-negative nature of the variable. The tobit model is as follows:

$$\mathbf{Violent\ Incidents^* = x\beta + u, u/x \sim Normal(0,\sigma^2) \quad \text{Where } y = \max(0,20)}$$

$$- (\beta = \beta_1 \mathbf{Early\ Police\ Contact} + \beta_2 \mathbf{Demographics})$$

This model also controlled for available demographics and informed whether early police contact increases the risk of multiple incidents. The largest portion of individuals in the dataset (41%) was involved in one incident, followed by individuals involved in two incidents (22%); over

20% of the individuals were involved in five or more incidents. Of the 8,113 individuals recorded as being involved in a violent incident, 2,493 were arrested for their involvement, or 9.82% of the individuals in the dataset.

A dprobit model was used to understand whether early police contact is associated with increased likelihood for involvement in violence in any role, whether as a perpetrator, a witness, or a victim later in life. Dprobit displays the estimated marginal effect at the sample means allowing the marginal effects of the independent variables across the models to be compared. The dprobit model used the binary dependent variable, *Involved in Violence*. The model is shown below:

$$\text{Pr(Involved in Violence = 1)} = \Phi (\text{Early Police Contact, Race, Age})$$

The dprobit model was also used to understand whether incidents of trauma affect the risk of perpetrating violence later in life. This was classified using the dependent variable *Perpetration of Violence*. Both models were also run with the categorical variables for *Early Police Contact* to understand the differing effects of witness- and victim-based trauma.

The other variables included in each of the models are control variables, including race, gender, and age. Gender is restricted to males. Race is implemented as a control using the following categories of race: Black; Hispanic; Other Race, Race Missing; and White. While socioeconomic status, mental health, family structure, and neighborhood are also important factors in studying delinquency and gang involvement they were not included in the models as they are not available using the Worcester Police Department data (Eitle et al., 2004).

[INSERT TABLE ONE ABOUT HERE]

Findings

In the estimated models for the effect of childhood trauma on violence, we found that early trauma had a positive and highly statistically significant impact on violence. A male that was coded as a witness or a victim in an early police contact was 20.9% more likely to perpetrate, be a victim, or be a witness to violence later in life than a male who had no documented early childhood police contacts, statistically significant at the 1% level. A male who had an early police contact in the role of witness was 21.2% more likely to be involved in a violent incident later in life either as a victim, witness, or arrested, statistically significant at the 1% level. Counter-intuitively, a male who had early police contact as a victim was 2.3% less likely to be involved in a violent incident later in life. A male who had an early police contact as both a victim and witness was 49.2% more likely to be involved in a violent incident later in life than a male who did not experience any trauma, statistically significant at the 1% level (See Table 2).

A male who had an early police contact was 2.58% more likely to perpetrate violence later in life than an individual who had no documented early police contacts, statistically significant at the 1% level. An individual who was a victim in an early police contact was 1% more likely to perpetrate violence later in life, statistically significant at the 1% level. The correlation between witness based early police contacts and *Perpetration of Violence* was not statistically significant. An individual who experienced childhood trauma as both a witness and victim was 15.6% more likely to perpetrate violence later in life, statistically significant at the 1% level (See Table 2).

Table 2 about here

In Table Two, we see that any incident involving early police contact increased an individual's likelihood of perpetrating violence; this supports the findings from the probit model. Any incident involving early police contact increased the number of violent incidents later in life by .8 for the average individual, statistically significant at the 1% level.

The number of violent incidents later in life was increased by a larger magnitude if an individual had solely experienced witness-based trauma, an increase in violent incidents of .531 ($p < 0.01$), than if an individual had solely experienced victim-based trauma, an increase in violent incidents of .458 ($p < 0.01$). The number of violent incidents was not surprisingly increased by the largest magnitude for individuals who had experienced both witness- and victim-based childhood trauma. This group had 3.078 more incidents of violence than the base group, individuals who had no trauma, statistically significant at the 1% level (See Table 3).

Table 3 about here

Worcester's Response

After using these findings to secure a small planning grant from the local community foundation, the Project Leadership Team and the research partner convened a working group made up of pediatricians, psychologists, early childcare education professionals, domestic violence victim advocates, youth mobile crisis team behavioral health specialists, the Worcester Police Department Crisis Intervention Team and Gang Unit officers, and a representative from the city manager's office. This team spent nine months developing an intervention consisting of a police-community health worker (CHW) co-responder model that directs child and family intervention at the point of trauma as well as a robust referral network for longer-term family support for both witnesses and victims (See Figure Two). The intervention—referred to locally as Worcester ACTs (Worcester Addresses Childhood Trauma) is envisioned to start before

symptoms even have time to manifest in a child. The working group felt that CHW's with specialized trauma-informed training would be best suited in this co-responder model in that they would have a greater likelihood of success gaining the trust of these very high risk families who tend to distrust social service agencies and institutions.

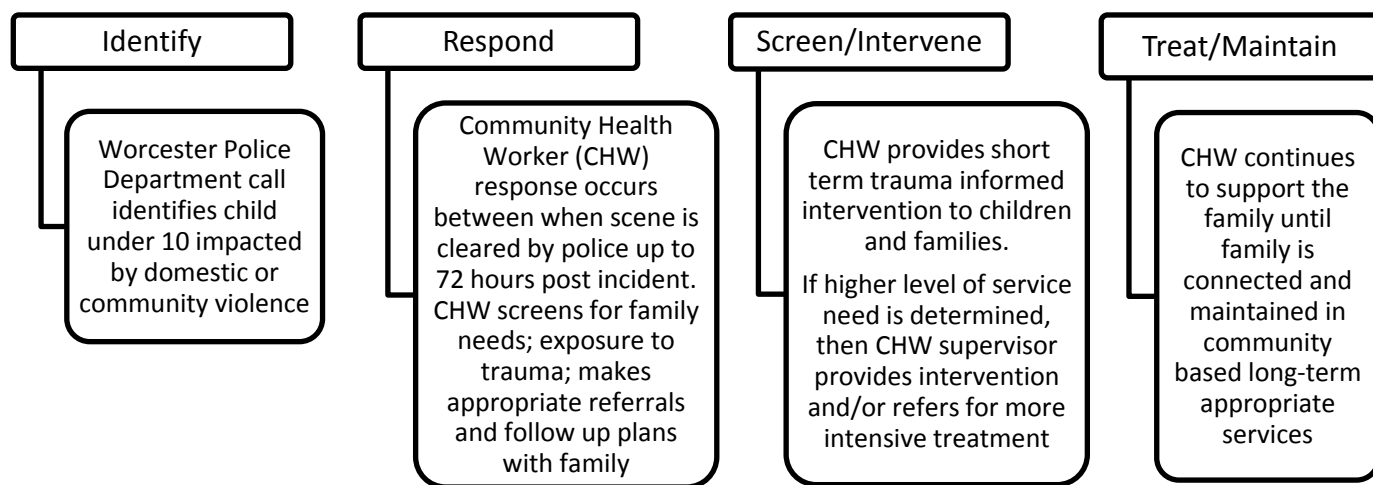


Figure 2: Worcester ACTs: Early Childhood Co-responder Model

Co-responding models have been shown to reduce the likelihood of injuries to children, youth, bystanders and police during police encounters (Reuland, Draper, & Norton 2012) and facilitate connecting children and youth to mental health and trauma services (Markey, Usher, Gruttadaro, Honberg, & Cochran, 2011). Several local funders have committed resources to support the development of Worcester ACTs. Additionally, the findings of this problem analysis convinced police leadership to include in-service training about the impact of trauma on child development. To date, all 400+ officers in the Worcester Police Department have received a first round of this training. Early childhood trauma is also a special module in the training of Crisis Intervention Team Officers and all new recruits.

Discussion

It is well documented that children who experience childhood trauma—either as a victim or witness—are at greater risk to engage in serious delinquent behaviors in adolescence, including violence (Dahlberg & Potter, 2001; Howard et al. 2002; Smith & Thornberry, 1995; Widom & Maxfield, 2001; Wood et al., 2002; see Berg, Stewart, Schreck, & Simons, 2012; Jennings, Piquero, Reingle, 2012; Lauritsen, Sampson, & Laub, 1991; Ousey, Wilcox, & Fisher, 2011; Posick, & Gould, 2015 for evidence of the offender-victim overlap). Trauma in early childhood has detrimental effects on brain development in areas that regulate fear response, impulse control, reasoning, planning, and academic learning (Eckenrode, et al., 1993; Herrenkohl, et al., 2013). These effects on the brain can cause children to have extreme reactions to seemingly low-stress incidents. Hypervigilance and exaggerated reactions result from the stress response system activating more frequently and for longer periods than is necessary (Fisher, et al., 2000). Long-term, unaddressed trauma, also known as toxic stress, is associated with mental and physical health disorders as well as overall shorter life expectancy as adults (Felitti et al., 1998; Shonkoff & Garner, 2012). Although the brain continues to develop over the lifespan, some stress-related changes are resistant to reversal. Therefore early intervention to address the effects of trauma while the child’s brain is still sufficiently ‘plastic’ or open to influence is essential (Davidson & McEwen, 2012).

Worcester’s comprehensive community assessment exposed drivers of youth and gang violence that previously had gone unaddressed. Revealing early childhood trauma as one of those drivers helped to explain why certain patterns in Worcester’s youth violence problem have persisted in spite of years of programmatic intervention. In depth-problem analysis allowed city decision-makers to understand that there was a significant correlation between recorded incidents

in which boys were a witness or victim to a traumatic event and later involvement in violence, either as a victim, witness, or being arrested. As the research partner, we were able to establish that boys who experienced both witness and victim-based trauma had a significantly higher likelihood of engaging in violence later in life than boys who had not experienced early trauma. These boys were over 49% more likely to have a violent incident later in life and predicted to be involved in roughly three more recorded incidents involving violence as adolescents or young adults than boys who had no early police-recorded incidents, controlling for age and race. As the majority of individuals in the dataset only had one recorded incidence of violence, the serious risk of early exposure to violence cannot be emphasized enough.

Of particular surprise to the decision-makers was the predictive nature of witnessing violence. Boys who only witnessed violence were more likely to experience violence later in life than boys who were victims only. We hypothesize the reason for this counter-intuitive finding is because victims are more likely to receive an intervention than witnesses. This finding about witnessing violence proved particularly powerful in catalyzing new stakeholders to come to the table. While the literature is robust about the relationship between early childhood trauma and later involvement in delinquency, it was not until we demonstrated this relationship locally that it became actionable evidence for Worcester stakeholders. Phase two, problem analysis, proved critical to the action research cycle.

Limitations

The data is limited to police documented incidents that occurred within the jurisdiction of the city in this study. This means that incidents of victimization, witness, or arrest outside of Worcester are unknown and cannot be factored into the regression analysis. Further, traumatic incidents that individuals in this dataset experienced to which police were not called are also not

captured in this analysis. In addition, many individuals were missing information on race. This limits the ability of race to be analyzed; however, race was examined during problem identification. Finally, this is a dataset of men with police contact, excluding all other males who may have been exposed to violence but who never had contact with the police in Worcester. These factors limit the findings of this study in terms of generalizability to other populations but not in terms of usefulness for informing the current patterns and practices in Worcester. In spite of these documented limitations, the results were compelling and revealed to local decision-makers that not only was victimization associated with cycles of violence, but also incidents of trauma as a witness. This information was used to inform the strategy development for an intervention to break the cycle of violence in Worcester that included witnesses, which had traditionally been overlooked.

Conclusion

Youth and gang violence are major public health problems requiring comprehensive approaches that are responsive to local dynamics. ‘Real-time social science’, as part of an action research cycle that includes rigorous problem identification and analysis conducted collaboratively between practitioners and an academic research partner, can help communities overcome some of the implementation challenges inherent in comprehensive youth and gang violence reduction approaches. While the analysis is collaborative, practitioners and academics play different roles in the process.

Law enforcement and other stakeholders suggest researchable questions that arise from their practice. They have access to needed data. They have practice-based hypotheses about problem causes and reasons interventions do not or may not work. The academic research partner has theory, content, methodological, and analytical expertise that they use collaboratively and

iteratively to respond to and build on practitioner-partners' knowledge and analysis. In the absence of a research partner, the problem analysis phase has traditionally been the weakest component of this action research cycle leading communities to adopt new or faddish programs without full consideration about the extent to which the program is relevant to local conditions and/or to continue to use the same strategies that have not worked (Boba, 2003). In this context, the Worcester, MA case offers an example of how robust problem analysis can reveal new options and evidence to address the local drivers of serious youth and gang violence.

This type of 'real time social science' is a form of community engaged scholarship that offers university faculty an opportunity to work in mutually beneficial partnership with practitioners and other community stakeholders to achieve practical, data-driven solutions to pressing social issues (Boba, 2003; Boyer, 1996; Burkhart et al., 2015). As research partners transform data into actionable information, new partners can be mobilized to engage in the dialogue on youth violence. New partners bring different knowledge, strategies and resources. By disrupting the traditional dialogue on youth and gang violence we are also seeing the possibility of disrupting persistent patterns and generational cycles of this complex societal problem.

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**Table One: Worcester Police Dataset
(N=25,375)**

Breakdown by Gender	
	Percent
Male	100
Female	0
Breakdown by Current Age	
0-10 Years-old	7.42
10-15 Years-old	8.6
16-18 Years-old	8.8
19-22 Years-old	21.34
23-27 Years-old	53.82
Breakdown by Race	
Black or African American	7.9
Hispanic/ Latino	15.33
White	28.15
Other Race	2.75
Race Missing	45.87
Breakdown by Childhood Police Contact (Age 12 and under)	
No Childhood Police Contact	80.53
One Contact	9.97
Two Contacts	6.15
Three Plus Contacts	3.35
Police Contact as Victim	18.24
Police Contact as Witness	3.78
Police Contact as Witness & Victim	2.2
Roles	
Witness (ever)	9.95
Victim (ever)	44.04
Ever Arrested	26.76
One Arrest	8.15
Two Plus Arrests	18.61
Ever Violent	32.04
Violent Arrest	9.82

Table 2: Effects of Childhood Trauma on Involvement in Violence and Violent Arrests

VARIABLES	Involvement in Violence	Perpetration of Violence	Involvement in Violence	Perpetration of Violence
	(1)	(2)	(3)	(4)
Victim	-0.0230**	0.0101***		
Witness	0.212***	-0.00179		
Victim and Witness	0.492***	0.156***		
Early Police Contact			0.209***	0.0258***
Observations	25,375	25,362	25,375	25,362

*** p<0.01, ** p<0.05, * p<0.1

Source: Results of probit estimations on Worcester Police Dataset (2015).

Notes: Marginal effects are shown instead of coefficients. *Involvement in Violence*=1 if an individual has at least once incident of violence recorded in the Worcester Police Dataset, 0 if they do not.

Perpetration of Violence=1 if an individual has been arrested for a violent incident recorded in the Worcester Police Dataset, 0 if they have not. *Victim*=1 if an individual has a recorded incident of victimization before age twelve, 0 if they do not. *Witness*=1 if an individual has a recorded incident as a witness before age twelve, 0 if they do not. *Victim and Witness*=1 if an individual has recorded incidents as both a victim and a witness before age twelve, 0 if they do not. *Early Police Contact*=1 if an individual has any recorded incident of childhood trauma (victim or witness before the age of 12), 0 if they do not. The base group is individuals who have no recorded incidents of childhood trauma. Race and age are controlled for in both models.

Table 3: Effects of Childhood Trauma on Total Violent Incidents

VARIABLES	# of Violent Incidents	# of Violent Incidents
	(1)	(2)
Victim	0.458***	
Witness	0.531***	
Victim and Witness	3.078***	
Early Police Contact		0.800***
σ	1.291***	1.342***
Observations	25,375	25,375

*** p<0.01, ** p<0.05, * p<0.1

Source: Results of tobit estimations on Worcester Police Dataset (2015).

Notes: Estimation using tobit model where the dependent variable, *Violent Incidents* is constrained from 0-20, representing the number of violent incidents. Standard errors in parentheses. *Victim*=1 if an individual has a recorded incident of victimization before age twelve, 0 if they do not. *Witness*=1 if an individual has a recorded incident as a witness before age twelve, 0 if they do not. *Victim and Witness*=1 if an individual has recorded incidents as both a victim and a witness before age twelve, 0 if they do not. Race is controlled for in the model. The base group for Age is 0-10. Restricted to males only.

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