CONTENTS

VOLUME 12 • ISSUE 2 • MAY 2013

DUI RECIDIVISM

LOCAL IMMIGRATION ENFORCEMENT

Guide to Preparing Manuscripts

Editorial Policy—*Criminology & Public Policy* (CPP) is a peer-reviewed journal devoted to the study of criminal justice policy and practice. The central objective of the journal is to strengthen the role of research findings in the formulation of crime and justice policy by publishing empirically based, policy-focused articles. Authors are encouraged to submit papers that contribute to a more informed dialogue about policies and their empirical bases. Papers suitable for CPP not only present their findings, but also explore the policy-relevant implications of those findings. Specifically, appropriate papers for CPP do one or more of the following:

- Strengthen the role of research in the development of criminal justice policy and practice
- Empirically assess criminal justice policy or practice, and provide evidence-based support for new, modified, or alternative policies and practices
- Provide more informed dialogue about criminal justice policies and practices and the empirical evidence related to these policies and practices
- Advance the relationship between criminological research and criminal justice policy and practice

The policy focus of the journal requires articles with a slightly different emphasis than is found in most peer-reviewed academic journals. Most academic journals look for papers that have comprehensive literature reviews, provide detailed descriptions of methodology, and draw implications for future research. In contrast, CPP seeks papers that offer literature reviews more targeted to the problem at hand, provide efficient data descriptions, and include a more lengthy discussion of the implications for policy and practice. The preferred paper describes the policy or practice at issue, the significance of the problem being investigated, and the associated policy implications. This introduction is followed by a description and critique of pertinent previous research specific to the question at hand. The methodology is described briefly, referring the reader to other sources if available. The presentation of the results includes only those tables and graphs necessary to make central points (additional descriptive statistics and equations are provided in appendices). The paper concludes with a full discussion of how the study either provides or fails to provide empirical support for current, modified, or new policies or practices. The journal is interdisciplinary, devoted to the study of crime, deviant behavior, and related phenomena, as found in the social and behavioral sciences and in the fields of law, criminal justice, and history. The major emphases are theory; research; historical issues; policy evaluation; and current controversies concerning crime, law, and justice.

Manuscript Submissions—**Manuscripts are to be submitted electronically to cpp@fsu.edu. The manuscript should be submitted in one Word (.doc) file with tables and figures in the same document as the manuscript text.** Additional documents, including cover letters or memos to the editor, may also be e-mailed as supplemental files. Although we strongly encourage on-line submission, those who prefer not to submit on-line may send a CD to Julie Mestre Brancale, Managing Editor, Florida State University, Center for Criminology & Public Policy Research, 325 John Knox Road Building L-102, Tallahassee, FL 32303.

An executive summary of approximately 150 words and a brief biographical paragraph describing each author's current affiliation, research interests, and recent publications should accompany the manuscript.

Papers accepted for publication should comply with American Psychological Association guidelines concerning nonsexist language. We accept three formats for digital artwork submission: Encapsulated PostScript (EPS), Portable Document Format (PDF), and Tagged Image Format (TIFF). We suggest that line art be saved as EPS files. Alternately, these may be saved as PDF files at 600 dots per inch (dpi) or better at final size. Tone art, or photographic images, should be saved as TIFF files with a resolution of 300 dpi at final size. For combination figures, or artwork that contains both photographs and labeling, we recommend saving figures as EPS files, or as PDF files with a resolution of 600 dpi or better at final size. More detailed information on the submission of electronic artwork can be found at:

http://authorservices.wiley.com/bauthor/illustration.asp

The American Society of Criminology regards submission of a manuscript to this journal as a commitment to publish herein; simultaneous submission to another journal is unacceptable. Every effort will be made to notify authors of editorial decisions within 3 months of manuscript and processing fee receipt. Note that CPP publication decisions arrive by postal mail, so please indicate whether you prefer e-mail correspondence to postal mail upon submission of your manuscript.

Please consult and conform to the CPP Style Sheet, which is available at cpp.fsu.edu, prior to submission.

Criminology & Public Policy (Print ISSN #1538-6473/On-line ISSN #1745-9133) is published quarterly on behalf of the American Society of Criminology, 1314 Kinnear Road, Suite 212, Columbus, OH 43212 by Wiley Subscription Services, Inc., a Wiley Company, 111 River St., Hoboken, NJ 07030-5774.

Information for subscribers. *Criminology & Public Policy* is published in four issues per year. Institutional print and on-line subscription prices for 2013 are: US$328 (U.S.), US$403 (rest of world), €258 (Europe), £206 (U.K.). Prices are exclusive of tax. Asia-Pacific GST, Canadian GST and European VAT will be applied at the appropriate rates. For more information on current tax rates, please go to www.wileyonlinelibrary.com/tax-vat. The price includes online access to the current and all online back files to January 1st 2009, where available. For other pricing options, including access information and terms and conditions, please visit www.wileyonlinelibrary.com/access. A subscription to *Criminology & Public Policy* also includes 4 issues of *Criminology.*

Delivery Terms and Legal Title. Where the subscription price includes print issues and delivery is to the recipient's address, delivery terms are Delivered at Place (DAP); the recipient is responsible for paying any import duty or taxes. Title to all issues transfers FOB our shipping point, freight prepaid. We will endeavour to fulfil claims for missing or damaged copies within six months of publication, within our reasonable discretion and subject to availability.

Journal customer service. For ordering information, claims, and any inquiry concerning your journal subscription, please visit www.wileycustomerhelp.com or contact your nearest office. *Americas* e-mail: cs-journals@wiley.com; telephone: +1 781 388 8598 or +1 800 835 6770 (toll free inside the U.S. and Canada). *Europe, Middle East, and Africa* e-mail: cs-journals@wiley.com; telephone: +44 (0) 1865 778315. *Asia Pacific* e-mail: cs-journals@wiley.com; telephone: +65 6511 8000. *Japan* For Japanese speaking support, email: cs-japan@wiley.com; telephone: +65 6511 8010 or telephone (toll free): 005 316 50 480. ***Visit our Online Customer Get-Help*** available in 6 languages at www.wileycustomerhelp.com.

Membership. American Society of Criminology membership is available to all interested people. Individuals interested in joining should complete and return the application forms on the American Society of Criminology Web site (www.asc41.com). Membership in the American Society of Criminology includes a subscription to *Criminology* and *Criminology & Public Policy*.

Back issues. Information about the availability and prices of back issues can be obtained from the American Society of Criminology by e-mail (asc@asc41.com) or telephone (614-292-9207).

Mailing and on-line access. Journal Customer Services, John Wiley & Sons, Inc., 350 Main St., Malden, MA 02148-5020. Postmaster: Send all address changes to *Criminology & Public Policy.* View this journal online at wileyonlinelibrary.com. For submission instructions, subscription and all other information, visit http://onlinelibrary.wiley.com/journal/10.1111/(ISSN)1745-9133.

Access to this journal is available free online within institutions in the developing world through the AGORA initiative with the FAO, the HINARI initiative with the WHO and the OARE initiative with UNEP. For information, visit www.aginternetwork.org, www.healthinternetwork.org, and www.oarescience.org. *Criminology & Public Policy* is published by Wiley Periodicals, Inc., Commerce Place, 350 Main Street, Malden, MA 02148; Tel: (781) 388-8200; Fax: (781) 388-8210.
ISSN 1538-6473 (Print)
ISSN 1745-9133 (Online)

Wiley contacts. Ang Wen Ting, Production Editor (e-mail: CAPP@wiley.com); Kristin McCarthy, Advertising (e-mail: kmccarthy@wiley.com).

Wiley's Corporate Citizenship initiative seeks to address the environmental, social, economic, and ethical challenges faced in our business and which are important to our diverse stakeholder groups. Since launching the initiative, we have focused on sharing our content with those in need, enhancing community philanthropy, reducing our carbon impact, creating global guidelines and best practices for paper use, establishing a vendor code of ethics, and engaging our colleagues and other stakeholders in our efforts. Follow our progress at www.wiley.com/go/citizenship.

Printed in the USA by The Sheridan Group.

DUI RECIDIVISM

The Challenges of Screening DUI Offenders

Alan Cavaiola
Monmouth University

Prior to 1970, most states in the United States had strict penalties that were imposed on convicted DUI offenders. These penalties usually included monetary fines and suspension of driving privileges with sanctions for multiple offenses (e.g., longer driving privilege suspensions and sometimes jail time). Naturally penalties imposed on recidivists were much greater than for first offenders. However, by the mid-1970s, the National Highway Traffic Safety Administration began to implement alcohol safety action programs (ASAPs), which were instituted in 35 communities across the United States and were sometimes referred to as alcohol countermeasure programs, whereby convicted DUI offenders were legally mandated to attend alcohol education programs. Many of these alcohol countermeasure programs would include some type of screening assessment to determine whether alcohol education was sufficient or whether alcohol counseling or treatment might be necessary. This came at a time when it was determined that strict DUI laws and penalties alone were not sufficient in reducing recidivism rates, which then were often as high as 33% of first offenders who would consequently receive a second DUI offense.

It has been estimated that approximately 50% of first-time DUI offenders may have an alcohol use disorder, whereas the other half probably comprise individuals who made a poor decision to drink and drive after attending an event such as a wedding or party (Vingilis, 1983). It was hypothesized that these poor decision makers probably do not drink and drive on a consistent basis, as do those with an alcohol use disorder, whereby drinking and driving is likely to occur on a regular basis (White and Gasperin, 2007). In this regard, it has been estimated that this group of drivers will make somewhere in the area of 400 drinking and driving trips, prior to coming to the attention of the police. In the new DSM-5 (American Psychiatric Association, 2013), included in their diagnostic criteria for a Substance Use Disorder, "Recurrent substance use (includes alcohol and other mood altering substances) in situations in which it is physically hazardous (criteria 8)." Physically hazardous use would obviously include drinking and driving; however, the operative word here is "recurrent." To

Direct correspondence to Alan Cavaiola, Psychological Counseling Department, Monmouth University, 400 Cedar Avenue, West Long Branch, NJ 07764-1898 (e-mail: acavaiol@monmouth.edu).

DOI:10.1111/1745-9133.12032

meet the diagnostic criteria, one would have to manifest at least 1 of the other 11 criteria within a 12-month period. Therefore, for someone who is arrested for a DUI offense, this may represent an isolated instance of excessive drinking and driving and may not necessarily meet the criteria for an alcohol use disorder.

The problem that has confounded those who screen convicted DUI offenders is that, by and large, this is a group of individuals who often are not willing or collaborative participants in the screening process. By the time most DUI offenders have arrived at the point where they are screened, they often have had negative experiences with the legal system. Many often have concluded that honesty is "not the best policy" and that self-disclosure may result in their having to participate in longer or more intensive programs at their own expense. Screeners have, therefore, had to rely on other means of collecting objective information. One of those seemingly objective measures is the BAC or blood alcohol content level at the time of the arrest. The principle behind using a BAC level is that extremely high BAC levels are presumed to imply an increased tolerance to alcohol. Tolerance is symptomatic of a potential for an alcohol use disorder because to achieve tolerance, one must be a frequent drinker. However, BAC levels are not without faults. For example, screeners must keep in mind that the BAC is only a single measure of alcohol intake prior to the arrest and therefore really does not reveal anything about alcohol dependence, frequency of use, or other problems related to alcohol or drug use. Also, depending on the timing of when the BAC is measured, the reading may reflect ascending or descending blood alcohol levels (e.g., if the DUI offender's last drink was within an hour or so of their arrest, the alcohol may still be in the process of being absorbed from the stomach and small intestine into the bloodstream). Also important to keep in mind is that women metabolize alcohol differently (usually more slowly) than men and women, therefore, will have higher BAC readings for the same amount of alcohol consumed given these differences in metabolism. Therefore, it will take fewer drinks for a woman to peak over the 0.08-g/dl limit than it would for male drinkers (Chan, 1987; Wieczorek, Miller, and Nochajski, 1992).

Although DUI screening often is intended to be a brief process in comparison with an in-depth biopsychosocial assessment, in some instances, offenders are assessed using a combination of both a standardized measure along with a structured interview similar to the approach used in the Mortimer Filkins Inventory. It is important to note, however, that one problem inherent with some standardized screening measures (e.g., Simple Screening Inventory [SSI]; Michigan Assessment Screening Test for Alcohol & Drugs [Westermeyer, Yargic, and Thuras, 2004] [MAST/AD]; and the Alcohol Use Disorders Identification Test [AUDIT]) is that they rely solely on honest self-disclosure to yield accurate, useful results. Some measures, however, attempt to surmount this problem by asking indirect questions that pertain to correlates of alcohol use disorders and by including validity scales. The purpose of these validity subscales is to pick up on false responding that may result from defensiveness, evasiveness, or a lack of insight. Examples of measures that include some type of validity measure are the Research Institute on Addictions Self Inventory (Nochajski and Miller,

1995) (RIASI), the Substance Abuse Subtle Screening Inventory (Miller, 2000) (SASSI-3), and the MacAndrews Alcoholism Scale-Revised (MAC-R), which is a supplementary scale of the Minnesota Multiphasic Personality Inventory-2 (MMPI-2). These measures often require additional time and training to administer and interpret and may not be suitable for all screening situations.

Another approach to screening DUI offenders is to examine the characteristics of individuals who become DUI recidivists and then compare whether the first offender's profile correlates with that of recidivists. This approach is taken by the Research Institute on Addictions Self Inventory (RIASI), whereby DUI offenders are screened by examining both drinking patterns and correlates of those who are most likely to become DUI recidivists by using indirect questions that are less prone to defensive responding. For example, traits such as high sensation seeking, impulsivity, and risk taking along with a history of criminal behavior and risky driving behaviors often are characteristic of DUI recidivists; therefore, the RIASI examines how DUI first offenders score on these traits and behaviors (Nochajski and Stasiewicz, 2006).

The current study by Dugosh, Festinger, and Marlowe (2013, this issue) takes a somewhat similar approach by looking at various correlates or predictors of DUI recidivism (e.g., arrest record, arrest for an alcohol- or drug-related offense, driving record, driving arrests for moving violations, and first DUI occurred as a young adult) and by determining whether these correlates will distinguish a group of first offenders from those with repeat offenses. Dugosh et al. found that certain variables were useful in distinguishing the two offender groups (e.g., earlier age of substance use onset, criminal arrests, drug arrests, and moving violation arrests), whereas other variables (including BAC) were not robust predictors in discriminating the two groups. The intention of Dugosh et al. in developing a 26-question, risk-based screening measure is to create a screening tool that has potential use not only in assessing DUI offenders but also in guiding policy and sentencing guidelines.

Included in this section are three insightful policy essays written by well-known experts in the field of DUI offender research who help to provide greater depth and context to Dugosh et al.'s (2013) research. For example, Fell and Voas (2013, this issue) agree on the importance of having effective screening measures for use with the first-offender population but question whether such measures will be employed given the current zeitgeist of dwindling court resources. Also, as only a small percentage of the approximate 1.4 million Americans who are arrested annually for DUI will actually be properly screened, Fell and Voas make three cogent recommendations for helping to prevent DUI offenses and DUI recidivism. First is the implementation of sobriety checkpoints, which have proven effective both in the United States as well as in other countries where they have had wider application. Second is the lowering of the BAC limit to 0.05, which has been adopted and has been proven effective in at least 91 other countries. Third is that screening and brief alcohol interventions be moved to medical facilities where they can be easily conducted

by medical personnel who most likely would be trained in using screening, brief intervention, and referral to treatment (SBIRT)-type screening approaches based on a public health model. Medical settings may provide a perfect setting for use of the 26-item screening instrument developed by Dugosh et al. even though it was designed for use in criminal justice settings.

Wieczorek (2013, this issue), in the second policy essay, points out that the criminal justice approach to DUI has traditionally been based on deterrence theory (i.e., the likelihood of being caught, the swiftness of punishment, and the severity of sanctions). He focuses on the importance of general deterrence versus specific deterrence policies. With regard to general deterrence policy, increased sanctions for elevated BAC are discussed. Wieczorek points out that graduated sanctions or penalties for more elevated BAC levels could be maintained even though Dugosh et al. (2013) conclude that the BAC itself was not predictive of recidivism in the population they studied. With regard to specific deterrence policies, Wieczorek suggests it is logical to apply some type of sanction (e.g., educational groups) to all first DUI offenders and that additional sanctions such as alcohol interlocks and treatment interventions be applied as an alternative to "traditional sanctions" such as fines or jail time. Wieczorek also concludes that although BAC levels alone are not a valid indicator of an alcohol use disorder that the "lack of predictive utility for BAC, however, does not obviate the systemic need to identify first offenders that would benefit, by reduced risk for recidivism, from more intensive interventions."

In the third policy essay, DeMichele and Payne (2013, this issue) raise many important considerations regarding which predictive tools are used in screening DUI offenders, how they are created, and how they fit into the broader context of reducing DUI recidivism. They make an important point that using risk assessment tools to inform and redefine policy may be a reasonable use; however, using assessment measures to "inform sentencing guidelines" may place the screening process within the purview of punitive sanctions, which is usually not how screening tools have been used. Also, they take into account that punitive approaches alone have not been successful in reducing DUI recidivism. As a result, DeMichele and Payne recommend that risk assessment tools should explore questions of when and why people begin to drink and drive, the frequency of such behavior, and if there are periods of spontaneous remission. They also point to statistical methodologies (e.g., the Poisson distribution and algorithmic methods) that may provide more effective strategies for developing effective assessment measures for use in criminal justice settings. Furthermore, DeMichele and Payne caution that criminal justice professionals need to be aware of the limitations of risk assessment measures in predicting DUI recidivism.

Taken together, the policy essays point out several potential challenges for those professionals (i.e., probation officers and counselors) who have the task and challenge of screening DUI offenders and who provide cogent, efficacious recommendations that will help to reduce DUI recidivism and improve public safety. Dugosh et al. (2013) provide a potential measure toward realizing this goal.

References

Chan, Arthur W. 1987. Factors affecting the drinking driver. *Drug and Alcohol Dependence*, 19: 99–119.

DeMichele, Matthew and Brian Payne. 2013. If I had a hammer, I would not use it to control drunk driving: Using predictive tools to respond to persistent drunk driving. *Criminology & Public Policy*, 12: 213–225.

Dugosh, Karen L., David S. Festinger, and Douglas B. Marlowe. 2013. Moving beyond BAC in DUI: Identifying who is at risk of recidivating. *Criminology & Public Policy*, 12: 181–193.

Fell, James C. and Robert B. Voas. 2013. Deterring DUI behavior in the first place: A bigger bang for the buck? *Criminology & Public Policy*, 12: 203–211.

Miller, Glenn A. 2000. *The Substance Abuse Subtle Screening Inventory-III*. Bloomington, IN: The SASSI Institute.

Nochajski, Thomas H. and Brenda A. Miller. 1995. *Training Manual for the Research Institute on Addictions Self Inventory (RIASI)*. Buffalo, NY: Research Institute on Addictions.

Nochajski, Thomas H. and Paul R. Stasiewicz. 2006. Relapse to driving under the influence (DUI): A review. *Clinical Psychology Review*, 26: 179–185.

Vingilis, Evelyn. 1983. Drinking drivers and alcoholics: Are they from the same population? In (Reginald G. Smart, Frederick B. Glaser, Yedy Israel, Harold Kalant, Robert E. Popham, and Wolfgang Schmidt, eds.), *Research Advances in Alcohol and Drug Problems*, Vol. 7. New York: Plenum Press.

Westermeyer, Joseph, Ilhan Yargic, and Paul Thuras. 2004. Michigan assessment-screening test for alcohol and drugs: Evaluation in a clinical sample. *American Journal on Addictions*, 13: 151–162.

White, William L. and David L. Gasperin. 2007. The "hard core drinking driver": Identification, treatment and community management. *Alcoholism Treatment Quarterly*, 25: 224–242.

Wieczorek, William F. 2013. Criminal justice and public health policies to reduce the negative impacts of DUI. *Criminology & Public Policy*, 12: 195–201.

Wieczorek, William F., Brenda A. Miller, and Thomas H. Nochajski. 1992. The limited utility of BAC for identifying alcohol-related problems among DWI offenders. *Journal of Studies on Alcohol*, 53: 415–419.

Alan Cavaiola is a professor and a member of the graduate faculty in the Department of Psychological Counseling at Monmouth University, West Long Branch, NJ. He has been involved in screening and treating DUI offenders since 1979 and has co-authored several research studies that examine characteristics of DUI offenders and predictors of recidivism. He is the co-author of *Assessment and Treatment of the DWI Offender* (2000) published by Taylor & Francis.

EXECUTIVE SUMMARY

DUI RECIDIVISM

Overview of: "Moving beyond BAC in DUI: Identifying Who Is at Risk of Recidivating"

Karen L. Dugosh
Treatment Research Institute

David S. Festinger
Treatment Research Institute and The University of Pennsylvania

Douglas B. Marlowe
Treatment Research Institute, The University of Pennsylvania and National Institute of Drug Court Professionals

Research Summary

Driving under the influence (DUI) represents a significant threat to public safety in the United States, and a significant proportion of first-time DUI offenders go on to become repeat offenders. Substantial resources have been expended to identify variables that predict DUI recidivism, but less progress has been made in developing clinically useful tools to predict recidivism accurately. In the current study, we developed a brief empirically based tool containing markers of recidivism risk and treatment need and conducted a small study to examine the ability of items to discriminate between first-time and repeat DUI offenders. Analyses identified several criminal risk and treatment need variables that discriminated between the two groups; however, blood alcohol concentration (BAC) did not.

Policy Implications

Further validation of these findings and the refinement of the triage tool could provide a practical, evidence-based means of screening and triaging first-time DUI offenders and help to inform and refine policy and sentencing guidelines.

Keywords

driving under the influence, *driving while intoxicated*, *blood alcohol concentration (BAC)*, *risk assessment*, *DUI recidivism*

DOI:10.1111/1745-9133.12019

Moving beyond BAC in DUI

Identifying Who Is at Risk of Recidivating

Karen L. Dugosh
Treatment Research Institute

David S. Festinger
Treatment Research Institute and The University of Pennsylvania

Douglas B. Marlowe
Treatment Research Institute, The University of Pennsylvania and National Institute of Drug Court Professionals

Driving under the influence (DUI) is one of the nation's top risks to public safety. According to the National Highway Traffic Safety Administration (NHTSA) (2010), approximately one third of all traffic fatalities in the United States are alcohol related. Furthermore, almost 20% of fatally injured drivers test positive for illicit substances, and when one considers only those cases where the fatally injured driver was tested for illicit substances, this proportion rises to approximately one third. Importantly, these statistics only reflect traffic accidents that resulted in a fatality. Although the majority of first-time offenders arrested for driving while impaired do not go on to repeat the offense, it is estimated that between 20% and 35% will become recidivist DUI offenders (e.g., Cornish and Marlowe, 2003; Schell, Chan, and Morral, 2006; Timken, 2002). In fact, impaired drivers who are involved in fatal car crashes are four times more likely to have a prior DUI conviction than nonimpaired drivers (NHTSA, 2012), and approximately 40% of fatally injured drunk drivers have a history of repeat DUI offenses (Lapham, Skipper, Hunt, and Chang, 2000). These alarming statistics highlight the need to identify first-time DUI offenders who may be at risk for becoming recidivist offenders. Although there has

This research was supported by a 1-year Pennsylvania Department Health SAP Grant #4100050911. The authors declare no potential conflicts of interest with respect to the research, authorship, and/or publication of this article. The authors gratefully acknowledge the continuous collaboration of the staff and clients of the 17th Judicial District Union/Snyder County Pennsylvania Drug Treatment Court. The authors also thank Lois Benishek, Chloe Brown, Adam Christmann, Nicolle Clements, Jason Croft, Matthew Haines, Ashley Harron, and Brittany Seymour for their assistance with this project.
Direct correspondence to Karen L. Dugosh, Treatment Research Institute, 600 Public Ledger Building, 150 S. Independence Mall West, Philadelphia, PA 19106-3414 (e-mail: kdugosh@tresearch.org).

DOI:10.1111/1745-9133.12020

been a significant amount of research conducted to identify predictors of DUI recidivism (see Nochajski and Stasiewicz, 2006, for a review), the field has made fewer strides in identifying practical methods to determine who is at risk of recidivating in a way that is clinically useful to stakeholders and decision makers.

Predictors of Recidivism

Decades of research have provided a wealth of reliable predictors of DUI recidivism. The most frequently identified DUI risk factors include current age, marital status, educational attainment, employment status, blood alcohol concentration (BAC) at the time of arrest, number of prior DUI arrests, number of prior criminal arrests, number of prior moving motor vehicle offenses, alcohol use severity, and co-morbid psychiatric disorders (e.g., Beerman, Smith, and Hall, 1988; Bishop, 2011; Cavaiola, Strohmetz, and Abreo, 2007; C'de Baca, Miller, and Lapham, 2001; Lapham, C'de Baca, McMillan, and Lapidus, 2006; Nochajski, Miller, Wieczorek, and Whitney, 1993; Nochajski and Stasiewicz, 2006; Peck, Arstein-Kerslake, and Helander, 1993; Portman et al., 2010; Schell et al., 2006; Timken, 2002).

Despite the identification of many highly robust predictors, most states and jurisdictions rely heavily on BAC level to determine the severity of the DUI charge and level of treatment or prevention services for first-time offenders (NHTSA, 2001, 2005). In fact, most states have developed mandatory minimum sentencing guidelines that are based largely on level of BAC at the time of the arrest (National Conference of State Legislatures, 2012). As an example of this practice, the Commonwealth of Pennsylvania has a graduating scale of penalties related to BAC levels (Pennsylvania Department of Transportation Driver and Vehicle Services, 2003). According to this graduating scale, a BAC of less than 0.08 represents the legal limit, a BAC of 0.08–0.099 is considered general impairment, a BAC of 0.10–0.159 is considered a high rate of alcohol, and a BAC of 0.16 and greater is considered the highest rate of alcohol. Although sentencing guidelines for repeat offenders can be mitigated by number of prior DUI convictions, BAC level can the make the difference between a sentence of short-term probation and 6 months of incarceration for first-time offenders. In either case, the law is unambiguous on this issue—the higher the rate of alcohol in the driver's system, the stricter the punishment. This results in higher legal fees, longer jail time, and possibly mandatory screening and treatment.

Accurately Screening for Treatment Need

BAC level is often used as a determinant of placement in treatment or clinical services, or as a factor in the administration of a jurisdiction's diagnostic battery or screening tool (e.g., Filkins, Mortimer, Post, and Chapman, 1973; Voas, DuPont, Talpins, and Shea, 2011; White, 2003). Treatment for DUI offenders may range from a brief psychoeducational course on driver safety and driving under the influence to intensive individualized treatment for alcohol and substance abuse. Although the decision to drive while impaired may be a

marker of alcohol or drug abuse or dependence, it is not a reliable indicator of these disorders especially among first-time offenders. In fact, research has suggested that BAC level at the time of arrest may not be a reliable marker for level of alcohol-related problems including abuse and dependence diagnoses. Wieczorek, Miller, and Nochajski (1992) examined 235 DUI offenders who were referred for an alcoholism evaluation. Their findings revealed no significant relationship between BAC level and alcohol-related problems, problem drinking, and alcohol abuse or dependence diagnoses. These findings call into question the utility of using this single marker for diagnostic and placement decisions.

Several instruments have been developed to screen for alcohol abuse and dependence including the Alcohol Use Disorders Identification Test (AUDIT; Babor, de la Fuente, Sanders, and Grant, 1989), the Michigan Alcohol Screening Test (MAST; Selzer, 1971), and the CAGE Questionnaire (Ewing, 1984). Although these instruments have generally demonstrated good psychometric properties, the evidence for their diagnostic value is inconsistent (e.g., Aertgeerts, Buntinx, and Kester, 2004; Bradley, Boyd-Wickizer, Powell, and Burman, 1998; Carey, Carey, and Chandra, 2003; Cherpitel, 1997). Furthermore, these instruments focus on alcohol abuse and dependence. Screening for drug abuse and dependence would require the administration of drug-specific versions of these instruments (e.g., Drug Abuse Screening Test, Skinner, 1982; Drug Use Disorders Identification Test, Berman, Bergman, Palmstierna, and Schlyter, 2005), which could substantially increase screening time.

The Structured Clinical Interview for the DSM-IV (SCID; First, Spitzer, Gibbon, and Williams, 1997) is considered by many to be the gold standard of diagnostic assessments. The SCID provides a comprehensive diagnosis of alcohol or drug abuse or dependence that can be used for treatment and placement purposes. Despite its diagnostic capabilities, the SCID is designed to be administered by highly trained clinicians, takes a relatively long time to administer, and relies on an accurate self-report. Other assessments that are relevant to and widely used with the DUI offender population include the Addiction Severity Index (McLellan et al., 1992), Comprehensive Drinker Profile (Marlatt and Miller, 1984), and the Mortimer Filkins (Mortimer, Filkins, and Lower, 1971). However, these instruments, like the SCID, are lengthy, require significant training to administer, use a structured interview format, and rely on accurate self-report.

Need for Brief Triage Assessment Tool

There is a critical need for a brief, evidence-based tool to assess reliably DUI offenders as soon as possible after the point of arrest to help inform their dispositions and to refer them into the most effective and cost-efficient programs. This approach would optimally require simultaneous attention to offenders' risk of recidivating and need for clinical services. Despite the well-supported predictive validity of BAC level in this regard, it is only a single variable that is unable to provide adequate information on a first-time offender's level of risk of recidivism and/or need for substance abuse treatment. As such, BAC level alone should

arguably not be used as a sole determinant for increasing the severity of a DUI offender's case disposition. A more reasonable strategy could be to take several predictor variables into account when making such determinations.

A brief triaging tool that encompasses the most essential and pathognomonic diagnostic criteria from the DSM-IV-TR (American Psychiatric Association, 2000) could help criminal justice and addiction professionals to make more accurate diagnostic and placement decisions after the DUI offense. Pathognomonic criteria are those factors that can independently and definitively serve as indicators of the disorder. For drug or alcohol dependence, pathognomonic criteria may include (a) withdrawal, (b) binge use and loss of control, (c) cravings or compulsions to use, and (d) a chronic substance-abuse–related medical condition. The presence of any of these symptoms may presumably be a sufficient indicator of dependence.

This study represents an initial systematic effort to develop a risk-and need-based screening tool. The purpose of the current study was to identify empirically supported predictors of risk and treatment need that discriminate between first-time and repeat DUI offenders. These items were designed to be administered by non–clinically trained individuals in a relatively short amount of time to help inform initial sentencing and appropriate interventions.

Methods

Item Development

Literature Review. A systematic literature review was conducted to identify articles providing data on predictors of DUI recidivism. We identified 14 search terms related to DUI (i.e., Drinking and Driving, Driving Under the Influence, Driving Under the Influence of Drugs, Driving While Impaired, Driving While Intoxicated, Driving While Under the Influence, Drug Driving, Drugged Driving, Drunk Driving, DUI, DWI, Impaired Driving, OUI, and OVI) and 14 terms related to recidivism (i.e., Multiple Offender, Multiple Offense, Rearrest, Re-arrest, Recidivate, Recidivism, Reconviction, Re-conviction, Reentry, Re-entry, Reoffense, Re-offense, Repeat Offender, and Second Offense). The DUI and recidivism terms were crossed and literature searches were conducted in PsycINFO, PubMed, and Criminal Justice Abstracts bibliographic databases, and abstracts were collected. Articles meeting the following criteria were retained: (a) published in the year 1990 or later, (b) written in English, (c) conducted in the United States, (d) data driven, and (e) reported predictors of DUI recidivism. Fifty-three relevant articles were identified. An annotated bibliography was created to summarize the findings of these 53 articles, and a list of identified predictors was created.

Expert Panel. An expert panel participated in a 4-hour meeting designed to select the predictors to be included in the assessment tool. The panel consisted of eight professionals from a variety of disciplines and included a public defender, a probation officer, and researchers with expertise in the areas of impaired driving, alcohol and drug abuse diagnostic

assessment and treatment, and instrument development. Panel members reviewed and discussed the importance of each identified predictor variable, its level of empirical support, and any redundancy between identified variables. The panel also made suggestions for the wording of items, item format, directions for administration, and ways in which the items could be externally validated. This process resulted in the creation of a 26-item assessment that is described in more detail in the Measure section.

Participants

A total of 59 DUI offenders convicted of a DUI charge in Union and Snyder counties in Pennsylvania participated in the current study. A total of 29 individuals were first-time DUI offenders, and 30 individuals were repeat DUI offenders. The mean age in the sample was 31.6 years (standard deviation [SD] = 9.3), with first-time offenders being significantly younger than repeat offenders ($M = 29.1$, SD = 9.4 vs. $M = 34.0$, SD = 8.7, respectively; $t(57) = 2.09$, $p = .04$). Most of the sample was male (76%, $n = 45$) with a slightly higher percentage of males in the first-time offender sample than in the repeat offender sample (86% vs. 67%, $X^2(1) = 3.11$, $p = .08$. Most of the sample (75%) had a high-school diploma or GED, while 19% had a college degree, and educational level did not differ significantly between first-time and repeat offenders ($p = .39$). The average number of prior DUI convictions in the repeat offender sample was 1.5 (SD = 0.7; range = 1–3).

Study Procedures

Probation officers (POs) collected the data for the current study. Prior to beginning data collection, POs were trained by research staff on procedures for obtaining informed consent and participants' rights, interviewing and data collection, and data storage. POs informed potential participants about the study at the first probation appointment after their DUI conviction and sentencing on a rolling basis. Importantly, individuals were approached post-conviction and sentencing so that the data they provided for the study could not be used against their case and to reduce the likelihood of perceived coercion from the PO. Interested participants completed the consent process, and those who wished to participate provided verbal consent. All individuals who were approached consented to participate, and they received a $25 gift card to a department store as compensation for completing the assessment. Questionnaire items were completed by the PO using available offender records and, when necessary, self-report data from the study participants. All items were completed for each participant. No data were collected prior to obtaining approval from the Treatment Research Institute's Institutional Review Board to conduct this study.

Measure

The 26-item assessment was completed for both first-time and repeat offenders. A total of 20 items reflected key predictors of DUI recidivism based on our extensive literature review, while 6 items could be considered markers of substance dependence. For first-time DUI

offenders, the items were completed using the date of arrest for the current conviction as a point of reference. For repeat DUI offenders, the items were completed using the date of arrest for their *first conviction* as point of reference. For example, a repeat offender's answer to the item "number of prior misdemeanor arrests" would reflect the number of prior misdemeanor arrests at the time of his or her first DUI arrest.

Data Analysis

We identified meaningful cutoff values for each item based on the extant literature, examination of how the items were distributed in the sample, current statutes, and advice from the expert panel. Chi-square analyses were used to evaluate the extent to which each item differentiated between first-time and repeat offenders. Given that this was a pilot study that was not adequately powered, we relied on effect sizes rather than on p values to identify which items discriminated between the two groups of clients. An effect size (w) of 0.2 was used as the criterion to indicate a practically significant effect based on the recommendation of Ferguson (2009).

Results

The percentage of first-time and repeat offenders who met the predetermined criterion for each risk item is presented in Table 1 along with the corresponding effect size value. As shown in the table, 10 risk items were identified that discriminated between first-time and repeat offenders using a meaningful effect size criterion of 0.2. A total of 43% of repeat offenders reported having criminal associations at the time of their first DUI arrest compared with 10% of first-time offenders. Earlier age of onset of substance use and criminal activity and age at the time of the first DUI conviction also differentiated between the two groups of DUI offenders. Having prior arrests for (a) a summary alcohol or drug-related offense, (b) a misdemeanor offense, (c) a misdemeanor arrest for a crime against persons, or (d) prior moving violations was also more common among repeat-offenders than among first-time offenders. Finally, having had a prior treatment episode or having been fired from a job or expelled from school because of drug or alcohol use was more likely among repeat offenders than among first-time offenders. Importantly, BAC at the time of arrest did not differentiate between the two groups of DUI offenders using our criterion for a meaningful effect.

Similarly, the percentage of first-time and repeat offenders who met each predetermined criterion for each need item is presented in Table 2 along with the corresponding effect size value. Four need items discriminated between first-time and repeat offenders using an effect size criterion of 0.2. Experiencing binge use and loss of control or cravings and compulsions in the 12 months prior to their first DUI arrest was much more common in the sample of repeat offenders (60%) than in the sample of first-time offenders (3% and 10%, respectively). Likewise, rates of substance-use–related injuries and withdrawal syndrome were higher among repeat offenders than among first-time offenders. The two

TABLE 1

Endorsement of Risk Items for First-Time and Repeat Offenders

Item Content Area	First-Time Offender (29) Percent (N)	Repeat Offender (30) Percent (N)	Effect Size Size (*w*)
Criminal associates	10% (3)	43% (13)	0.37
Early engagement in substance use	10% (3)	37% (11)	0.31
Prior arrest for summary alcohol- or drug-related offense	14% (4)	40% (12)	0.29
Fired, suspended, or expelled for reasons related to alcohol or drug use	7% (2)	27% (8)	0.26
Prior misdemeanor arrest	10% (3)	30% (9)	0.24
Prior misdemeanor arrests for a crime against persons	0% (0)	10% (3)	0.23
Prior alcohol or substance abuse treatment	3% (1)	17% (5)	0.22
Early engagement in criminal activities	10% (3)	27% (8)	0.21
Frequent arrests for moving violations	10% (3)	27% (8)	0.21
First DUI conviction as young adult	14% (4)	30% (9)	0.20
Prior misdemeanor alcohol- or drug-related arrest	10% (3)	23% (7)	0.17
Markedly high BAC at the time of arrest	31% (9)	47% (14)	0.16
No valid driver's license at the time of the DUI	10% (3)	3% (1)	0.14
Involvement in prior criminal justice diversion programs	7% (2)	13% (4)	0.11
Prior driver's license suspension or revocation	38% (11)	47% (14)	0.09
Prior bench warrant	7% (2)	3% (1)	0.08
Prior felony arrest	3% (1)	3% (1)	0.00
Prior non-DUI felony alcohol- or drug-related arrests	7% (2)	7% (2)	0.00
Refusal of breathalyzer/ blood testing at time of arrest	7% (2)	7% (2)	0.00
Prior felony arrest for a crime against persons	3% (1)	0% (0)	n/a

Note. Item responses for first-time DUI offenders are based on 12 months prior to current conviction; item responses for repeat DUI offenders are based on 12 months prior to their initial DUI conviction.

TABLE 2

Endorsement of Substance-Abuse–Related Items for First-Time and Repeat Offenders

Item Content Area	First-Time Offender (29) Percent (N)	Repeat Offender (30) Percent (N)	Effect Size (*w*)
Binge use	3% (1)	60% (18)	0.60
Cravings	10% (3)	60% (18)	0.52
Substance-abuse–related injuries	0% (0)	17% (5)	0.30
Withdrawal symptoms	3% (1)	17% (5)	0.22
Substance-abuse–related medical condition	0% (0)	7% (2)	0.18
Mental health diagnoses	7% (2)	10% (3)	0.06

Note. Item responses for first-time DUI offenders are based on 12 months prior to current conviction; item responses for repeat DUI offenders are based on 12 months prior to their initial DUI conviction.

groups of offenders did not differ meaningfully on rates of substance-abuse–related medical conditions or major DSM-IV-TR Axis I diagnoses.

Discussion

DUI policies throughout the United States may be seen as being overly reliant on BAC for both mandatory sentencing and required treatment. For first-time DUI offenses in particular, most states generally rely on BAC levels to make administrative decisions not only about the type of sentence and treatment but also even for requiring further drug or alcohol assessment. Despite the widely demonstrated utility of BAC as a predictor of future recidivism (e.g., Cavaiola, Strohmetz, Wolf, and Lavender, 2003; C'de Baca, 1999; C'de Baca et al., 2001; Chang, Lapham, and Wanberg, 2001; Jones and Lacey, 2000; Ryb, Dischinger, Kufera, and Read, 2006), the results of the current study comport with findings from other studies (e.g., Marowitz, DeYoung, and Yu, 1996; Wieczorek et al., 1992) in demonstrating that BAC is not sufficient *in and of itself* for reliably assessing the future risk or current needs of individuals who commit a DUI offense. In fact, the BAC level at the time of the first DUI arrest did not discriminate between first-time and repeat offenders in the current study. However, several objective and verifiable risk indicators did differentiate between first-time and repeat offenders. Many of these verifiable risk variables related to offenders' criminal histories including age at time of first arrest for any criminal act, age at time of first DUI conviction, having a prior summary of alcohol- or drug-related offense, having a prior misdemeanor offense, having a misdemeanor arrest for a crime against persons, or having five or more prior moving violations. Other risk variables that differentiated the two groups included age of onset of substance abuse, having a prior treatment episode, or loss of employment or expulsion from school because of drug or alcohol use.

Taking into account these other potential indicators of DUI recidivism is likely to increase our ability to identify better individuals who are at risk for a future DUI arrest and to develop more informed sentencing guidelines and related policies. According to a study by Marowitz (1996) and consistent with statistical practice (Tabachnick and Fidell, 2007), a multivariate model is likely to result in a more accurate prediction of DUI recidivism. More informed policies could serve to improve public safety further by reducing the devastating consequences of individuals driving under the influence of alcohol and drugs.

In addition, the current study identified several clinical needs variables that discriminated between first-time and repeat DUI offenders. These variables included reporting binge use, cravings and compulsions, withdrawal symptoms, and substance-abuse–related injuries. Importantly, endorsing any of these symptoms may be a sufficient indicator of drug or alcohol dependence and the need for further assessment and/or treatment. In reviewing current DUI statutes, it is clear that there is a lack of standardization with regard to what triggers alcohol or substance use evaluations for DUI offenders. As was the case for criminal sentencing, the call for such evaluations is very likely tied to an offender's BAC level. Use of a brief screening tool that incorporates pathognomonic symptoms of chemical dependence

would presumably be a more effective and efficient way to identify which offenders may require additional services. Providing treatment services that match an offender's level of need is likely to reduce maladaptive behaviors, improve clinical outcomes, and further promote public safety.

There are several limitations to the current study. First, the sample size is relatively small for this pilot study, which reduces statistical power. To help address this limitation, we identified markers of risk and need using effect size indices rather than statistical significance levels. This approach is consistent with that suggested by Cohen (1990). In addition to statistical power, the relatively small sample size may limit the representativeness and generalizability of our findings. This may be compounded by the fact that the sample was drawn from a single judicial district with a somewhat homogenous population. Third, given the retrospective nature of the study, an unknown percentage of the first-time offenders are likely to become repeat offenders. However, this is true of most studies of this nature including medical trials in which the "normal" sample may go on to experience the event (e.g., cancer or heart attack). Finally, the study design attempts to examine determinants of DUI recidivism by comparing characteristics of first-time and repeat DUI offenders at the time of their first arrest. Although most of the variables considered were objectively validated through record checks, some of the more subjective variables such as the dependence symptoms and criminal associations are vulnerable to errors in recall or intentional misrepresentation.

The importance of identifying ways to determine who is at risk of recidivating in a way that is clinically useful to stakeholders and decision makers is undeniable. This study represents the first empirically driven initial effort to develop an assessment tool that will meet this crucial need. Given the critical nature of this endeavor, future research should be conducted to evaluate the validity and generalizability of these findings. Further validation of these findings and the refinement of the triage tool would provide a practical, evidence-based means of screening and triaging first-time DUI offenders and help to inform and refine policy and sentencing guidelines. Furthermore, a multivariate, empirically based tool such as this would have more clinical and practical utility than relying on BAC level alone to guide punitive sanctions or treatment recommendations given that the BAC index is relevant only to drivers who are alcohol impaired rather than drug impaired (i.e., drugged drivers) and that multitrait/multimethod approaches are more accurate in assessment (Campbell and Fiske, 1959). Future research also should incorporate longitudinal designs with larger and more heterogeneous samples of DUI offenders to evaluate the predictive validity of these markers in a prospective manner.

References

Aertgeerts, Bert, Frank Buntinx, and Arnold Kester. 2004. The value of the CAGE in screening for alcohol abuse and alcohol dependence in general clinical populations: A diagnostic meta-analysis. *Journal of Clinical Epidemiology*, 57: 30–39.

American Psychiatric Association. 2000. *Diagnostic and Statistical Manual of Mental Health Disorders*, 4th Edition. Washington DC: Author.

Babor, Thomas F., Juan R. de la Fuente, John B. Saunders, and Marcus Grant. 1989. *AUDIT The Alcohol Use Disorders Identification Test: Guidelines for Use in Primary Health Care*. Geneva, Switzerland: World Health Organization.

Beerman, Kathy A., Margaret M. Smith, and Roberta L. Hall. 1988. Predictors of recidivism in DUIs. *Journal of Studies on Alcohol*, 49: 443–449.

Berman, Anne H., Hans Bergman, Tom Palmstierna, and Frans Schlyter. 2005. Evaluation of the Drug Use Disorders Identification Test (DUDIT) in criminal justice and detoxification settings and in a Swedish population sample. *European Addiction Research*, 11: 22–31.

Bishop, Nicholas J. 2011. Predicting rapid DUI recidivism using the Driver Risk Inventory in a sample of Floridian DUI offenders. *Drug and Alcohol Dependence*, 118: 423–429.

Bradley, Katherine A., Jodie Boyd-Wickizer, Suzanne H. Powell, and Marcia L. Burman. 1998. Alcohol screening questionnaires in women: A critical review. *The Journal of the American Medical Association*, 280: 166–171.

Campbell, Donald T. and Donald W. Fiske. 1959. Convergent and discriminant validation by the multitrait-multimethod matrix. *Psychological Bulletin*, 56: 81–105.

Carey, Kate B., Michael P. Carey, and Prabha S. Chandra. 2003. Psychometric evaluation of the alcohol use disorders identification test and short drug abuse screening test with the psychiatric patients in India. *Journal of Clinical Psychiatry*, 64: 767–774.

Cavaiola, Alan, David B. Strohmetz, and Sandra D. Abreo. 2007. Characteristics of DUI recidivists: A 12-year follow-up study of first time DUI offenders, *Addictive Behaviors*, 32: 855–861.

Cavaiola, Alan, David B. Strohmetz, Jamie M. Wolf, and Neil J. Lavender. 2003. Comparison of DWI offenders with non-DWI individuals on the MMPI-2 and the Michigan Alcoholism Screening Test. *Addictive Behaviors*, 28: 971–977.

C'de Baca, Janet. 1999. *Risk Factors for Recidivism among DWI Offenders Entering Screening: A 4-year Follow-up*. Unpublished doctoral dissertation, University of New Mexico, Albuquerque, NM.

C'de Baca, Janet, William R. Miller, and Sandra Lapham. 2001. A multiple risk factor approach for predicting DWI recidivism. *Journal of Substance Abuse Treatment*, 21: 207–215.

Chang, Iyiin, Sandra C. Lapham, and Kenneth W. Wanberg. 2001. Alcohol use inventory: Screening and assessment of first-time driving-while-impaired offenders, I. Reliability and profiles. *Alcohol and Alcoholism*, 36: 112–121.

Cherpitel, Cheryl J. 1997. Brief screening instruments for alcoholism. *Alcohol Health and Research World*, 21: 348–351.

Cohen, Jacob. 1990. Statistical power analysis. *Current Directions in Psychological Science*, 3: 98–101.

Cornish, James and Douglas B. Marlowe. 2003. Alcohol treatment in the criminal justice system. In (Bankole A. Johnson, Pedro Ruiz, and Marc Galanter, eds.), *Handbook of Clinical Alcoholism and Treatment*. Baltimore, MD: Lippincott, Williams & Wilkins.

Ewing, John A. 1984. Detecting alcoholism: The CAGE questionnaire. *Journal of the American Medical Association*, 252: 1905–1907.

Ferguson, Christopher J. 2009. An effect size primer: A guide for clinicians and researchers. *Professional Psychology: Research and Practice*, 40: 532–538.

Filkins, Lyle D., Rudolf G. Mortimer, David V. Post, and Marion M. Chapman. 1973. *Field Evaluations of Court Procedures for Identifying Problem Drinkers*. Washington, DC: U.S. Department of Transportation.

First, Michael B., Robert L. Spitzer, Miriam Gibbon, and Janet B. W. Williams. 1997. *User's Guide for the Structured Clinical Interview for the DSM-IV Axis I Disorders.* Washington, DC: American Psychiatric Press.

Jones, Ralph K. and John H. Lacey. 2000. *State of Knowledge of Alcohol Impaired Driving: Research on Repeat DWI Offenders* (DOT HS 809 027). Washington, DC: National Highway Traffic Safety Administration, Department of Transportation.

Lapham, Sandra C., Janet C'de Baca, Garnett P. McMillan, and Jodi Lapidus. 2006. Psychiatric disorders in a sample of repeat impaired-driving offenders. *Journal of Studies on Alcohol*, 67: 707–713.

Lapham, Sandra C., Betty J. Skipper, William C. Hunt, and Iyiin Chang. 2000. Do risk factors for re-arrest differ for female and male drunk-driving offenders? *Alcoholism: Clinical and Experimental Research*, 24: 1647–1655.

Marlatt, Gordon A. and William R. Miller. 1984. *Comprehensive Drinker Profile*. Odessa, FL: Psychological Assessment Resources.

Marowitz, Leonard A. 1996. Predicting DUI recidivism. *Blood Alcohol Concentration and Driver Record Factors*. Vol. 1. Sacramento, CA: California Department of Motor Vehicles, Licensing Operations Division, Research and Development.

Marowitz, Leonard A., Dennis DeYoung, and Jiang Yu. 1996. Drunk-driving recidivism: Predicting factors from arrest context and case disposition [Commentary]. *Journal of Studies on Alcohol*, 57: 679–680.

McLellan, Andrew T., Harvey Kushner, David Metzger, Roger Peters, Iris Smith, Grant Grissom, Helen Pettinati, and Milton Argeriou. 1992. The fifth edition of the Addiction Severity Index. *Journal of Substance Abuse Treatment*, 9: 199–213.

Mortimer, Rudolf G., Lyle D. Filkins, and Jerold S. Lower. 1971. *Development of Court Procedures for Identifying Problem Drinkers: Final Report*. Report No. DOT-HS-800–631. Washington, DC: U.S. Department of Transportation, National Highway Traffic Safety Administration.

National Conference of State Legislature. 2012. *Increased Penalties for High Blood Alcohol Content*. Retrieved February 2013 from National Conference of State Legislature ncslorg/issues-research/transport/.increased-penalties-for-high-blood-alcohol-content.aspx.

National Highway Traffic Safety Administration. 2001. *Alcohol and Highway Safety 2001: A Review of the State of Knowledge*. DOT HS 809 383. Retrieved February 2013 from nhtsa.gov/people/injury/researchalcoholhighway/index.htm.

National Highway Traffic Safety Administration. 2005. *Traffic Safety Facts 2005 Data*. DOT HS 810 616. Retrieved February 2013 from nrd.nhtsa.dot.gov/Pubs/810616.pdf.

National Highway Traffic Safety Administration. 2010. *Traffic Safety Facts 2009: Alcohol-Impaired Driving*. DOT HS 811 385. Retrieved February 2013 from cdc.gov/Motorvehiclesafety/Impaired_Driving/impaired-drv_factsheet.html.

National Highway Traffic Safety Administration. 2012. *Traffic Safety Facts 2010: Alcohol-Impaired Driving*. DOT HS 811 606. Retrieved February 2013 from nrd.nhtsa.dot.gov/Pubs/811606.pdf.

Nochajski, Thomas H., Brenda A. Miller, William F. Wieczorek, and Robert Whitney. 1993. The effects of a drinker-driver treatment program: Does criminal history make a difference? *Criminal Justice and Behavior*, 20: 174–189.

Nochajski, Thomas H. and Paul R. Stasiewicz. 2006. Relapse to driving under the influence (DUI): A review. *Clinical Psychology Review*, 26: 179–195.

Peck, Raymond C., Gary W. Arstein-Kerslake, and Clifford J. Helander. 1993. Psychometric and biographical correlates of drunk-driving recidivism and treatment program compliance. *Journal of Studies on Alcohol*, 55: 667–678.

Pennsylvania Department of Transportation Driver and Vehicle Services. 2003. *.08 DUI Legislation*. Retrieved February 2013 from dmv.state.pa.us/legislation/dui.shtml.

Portman, Maria, Antti Penttila, Jari Haukka, Peter Eriksson, Hannu Alho, and Kimmo Kuoppasalmi. 2010. Predicting DUI recidivism of male drunken driving: A prospective study of the impact of alcohol markers and previous drunken driving. *Drug and Alcohol Dependence*, 106: 186–192.

Ryb, Gabriel E., Patricia C. Dischinger, Joseph A. Kufera, and Kathy M. Read. 2006. Risk perception and impulsivity: Association with risky behaviors and substance abuse disorders. *Accident Analysis and Prevention*, 38: 567–573.

Schell, Terry L., Kitty S. Chan, and Andrew R. Morral. 2006. Predicting DUI recidivism: Personality, attitudinal, and behavioral risk factors. *Drug and Alcohol Dependence*, 82: 33–40.

Selzer, Melvin L. 1971. The Michigan Alcohol Screening Test: The quest for a new diagnostic instrument. *The American Journal of Psychiatry*, 127: 1653–1658.

Skinner, Harvey A. 1982. The Drug Abuse Screening Test. *Addictive Behaviors*, 7: 363–371.

Tabachnick, Barbara G. and Linda S. Fidell. 2007. *Using Multivariate Statistics*, 5th Edition. Boston, MA: Allyn & Bacon.

Timken, David S. 2002. What works: Effective DWI interventions. In (Harry E. Allen, ed.), *What Works—Risk Reduction: Interventions for Special Needs Offenders*. Lanham, MD: American Correctional Association.

Voas, Robert B., Robert L. DuPont, Stephen K. Talpins, and Corinne L. Shea. 2011. Toward a national model for managing impaired driving offenders. *Addiction*, 106: 1221–1227.

White, William L. 2003. *Management of the High-Risk DUI Offender* [Monograph]. Springfield, IL: University of Illinois at Springfield Institute for Legal, Administrative and Policy Studies.

Wieczorek, William F., Brenda A. Miller, and Thomas H. Nochajski. 1992. The limited utility of BAC for identifying alcohol-related problems among DWI offenders. *Journal of Studies on Alcohol*, 53: 415–419.

Karen L. Dugosh is a scientist at the Treatment Research Institute. She is an investigator in the section in law and ethics and has played a key role in their National Institute on Drug Abuse (NIDA)-funded research on novel interventions for substance-abusing offenders and ethical dilemmas in substance-abuse research. Her current NIDA-funded research seeks to develop an assessment to measure coercive pressures to participate in research that is tailored to the doubly vulnerable population of substance-abusing offenders. She has disseminated her findings at scientific conferences and in peer-reviewed publications.

David S. Festinger is the Director of Law and Ethics at the Treatment Research Institute, an adjunct faculty member at the University of Pennsylvania, and a licensed clinical psychologist. His research has focused primarily on empirically isolating the active mechanisms of drug courts, developing empirically based dispositional procedures for substance abusing offenders, and bringing experimental research methods to bear on major ethical questions involving human subjects in substance abuse research. He has served as principal investigator and co-principal investigator on many state and federally funded grants and has authored numerous articles and chapters on the topics of crime and drug abuse.

Douglas B. Marlowe is a senior scientist at the Treatment Research Institute, chief scientific officer at the National Association of Drug Court Professionals, and an adjunct associate professor of psychiatry at the University of Pennsylvania. He has received numerous state and federal research grants to study the effects of drug courts and other specialized programs for drug-abusing offenders. He has published more than 100 research articles and chapters and is the editor of *Drug Court Review* and on the editorial boards of several peer-reviewed journals.

Criminal Justice and Public Health Policies to Reduce the Negative Impacts of DUI

William F. Wieczorek
State University of New York College at Buffalo State

Driving under the influence (DUI) has proven to be a persistent social problem for many decades in terms of criminal justice (e.g., laws, regulations, arrests, enforcement, adjudication, and property damage liability) and public health (e.g., crash injuries, fatalities, and substance abuse treatment) impacts. Driving while impaired by alcohol is a *malum prohibitum* offense; both behaviors (drinking by an adult and driving with a license) are legal, but they become illegal in specific circumstances (i.e., alcohol-induced impairment deemed by society to be of such a high level of risk to self and others as to be legally prohibited). Blood alcohol content (BAC) is a scientifically recognized indicator of driving impairment that increases strongly in a dose-response relationship (Zador, Krawchuk, and Voas, 2000). When technology became available to measure readily a driver's BAC, *per se* laws were enacted to codify this measure as indicative of legally proscribed impairment (Voas and Lacey, 1990).

Definitions of alcoholism and alcohol dependence typically include substantial tolerance, which is the need for higher doses to achieve the same perceived effect from the alcohol (American Psychiatric Association, 2000); this has led to the use of BAC as an indicator of alcoholism/dependence because high BACs suggest high tolerance. Alcohol dependence is known to be much more prevalent among DUI recidivists (Wieczorek and Nochajski, 2005), indicating that treatment for alcohol dependence would be an appropriate mechanism to reduce DUI recidivism. Thus, the criminal justice (e.g., definition of the offense) and public health aspects of DUI and BAC have been closely connected. The article by Dugosh, Festinger, and Marlowe (2013, this issue) raises substantial implications for criminal justice and public health policies because the findings suggest that BAC has limited, if any, potential to predict recidivism. This policy essay is focused mainly on the implications of the BAC-specific findings of the Dugosh et al. article and is not meant to

Direct correspondence to William F. Wieczorek, Center for Health and Social Research, State University of New York College at Buffalo State, Buffalo, NY 14222 (e-mail: wieczowf@buffalostate.edu).

DOI:10.1111/1745-9133.12038

be an exhaustive overview of a comprehensive approach to reducing DUI such as presented by Voas, DuPont, Talpins, and Shea (2011).

Criminal Justice Policies

The main criminal justice approach to DUI is deterrence theory, which includes three mechanisms: the likelihood of being caught by law enforcement, the swiftness of punishment (celerity), and the severity of the sanctions (Nagin and Pogarsky, 2001). General deterrence focuses on using these factors to convince the overall population of nonoffenders to avoid the prohibited behavior, whereas specific deterrence applies to reducing recidivism among the population of already apprehended offenders. The tools for achieving specific deterrence are primarily sanctions, including severe sanctions as well as alternative sanctions such as education and treatment interventions. This study has policy implications for both general and specific deterrence. DUI-specific policies can be implemented at the local, state, or national level in the United States; however, national policy making in this case would be through the federal government encouraging the states to enact specific legislation as all drivers' licensing and court or administrative sanctions are functions of the individual states. Local jurisdictions also may be able to implement policies that do not require specific legislation or regulation as part of the range of options already available.

General Deterrence Policies

The relevance to general deterrence policies of the finding that BAC is a poor predictor of recidivism is limited. Dugosh et al. (2013) argue that graduated sanctions based on elevated BAC alone should not be the basis for higher severity sanctions. This argument applies, at most, to sanctions that include treatment, rather than the severity of other penalties (e.g., fines and jail). There is a strong rationale for society to punish behaviors in proportion to the danger that the behavior poses to the public. Higher driver BACs are unarguably related to extreme increases in the risk for crashes, including fatalities (Zador et al., 2000).

Also, it is a reasonable possibility that the graduated sanctions for higher BACs have a differential effect on drinkers with alcohol use disorders, reducing their proportion in the categories of offenders with higher BACs, which may be one cause of the current lack of a relationship of BAC with recidivism. Wieczorek and Nochajski (2005) found significantly higher BACs for repeat DUI offenders as compared with first offenders; however, the sample in that study was from the 1990s, and the more recent graduated severity laws for higher BACs may have led to a general deterrent effect that changed the relationship between BAC and recidivism. Also, the potential role of moral commitment and social influence as part of a general deterrent effect (Berger and Snortum, 1986) provides support for a policy of graduated penalties for higher BACs. Thus, an important policy implication of the study by Dugosh et al. (2013) is to keep graduated sanctions based on high BACs in place, even if BAC itself is not predictive of recidivism.

Specific Deterrence Policies

The policy implications for specific deterrence of current offenders are different from those for general deterrence. A key aspect of the definition of "hardcore" persistent drinking drivers is driving at highly elevated BACs (Simpson, Beirness, Robertson, Mayhew, and Hedlund, 2004), which supported the rationale for using elevated BAC to predict recidivism. Dugosh et al.'s (2013) findings that BACs did not differentiate recidivists from first offenders strongly undermine the BAC-based rationale used to define persistent drinking drivers. A direct policy implication is that graduated penalties do not deter future offending (i.e., specific deterrence), even if these graduated penalties potentially do have a general deterrence effect.

Policies relevant to optimizing specific deterrence for all DUI first offenders regardless of BAC are necessary. It is logical to apply some sanctions to first offenders as an entire group of high-risk drivers because DUI offenders have long been recognized as a subset of all high-risk drivers (Donovan, Marlatt, and Salzberg, 1983). In addition, educational, instrumental (e.g., alcohol interlocks), and treatment interventions also can be considered a form of a sanction, rather than only an alternative to a more traditional sanctions (e.g., fine or jail time). Part of the potential impact of these interventions as sanctions on first offenders is to require that they carry the cost burden. The burden of costs increases as part of the sanctions in proportion to the total interventions needed (i.e., an indicator of increased recidivism risk). Note that the time required to participate in an intervention is also a cost. This pay-your-way concept could be viewed as unfair to those offenders that require many interventions such as addictions treatment; however, the public safety interest in deterring future impaired driving as well as the principle that individuals are responsible for the cost of their rehabilitation are arguments in support of the policy.

A policy relevant to all first-time DUI offenders, regardless of BAC level, is mandated participation in an educational program aligned with knowledge about alcohol, other drugs, and driver safety. The relevance of this policy is for offenders to be better able to make informed decisions to avoid future impaired driving, as there is some evidence of a specific deterrent impact for these educational programs (Wanberg, Milkman, and Timken, 2005). In addition to this educational policy should be a requirement for first offenders to have an alcohol interlock system if they have any driving privileges, as these systems are well known to reduce recidivism significantly during the period they remain active in the offenders' vehicle (Elder et al., 2011). The support for policies based on having all offenders totally abstain from alcohol or have their BAC checked daily (e.g., appear at a police station for a daily breath test) or continuously by some technology such as transdermal sensing should be explored in the future in terms of cost, logistics (to determine whether these systems are feasible in areas with thousands of DUI offenders), and effectiveness.

Another potential remaining role for BAC is to identify those first offenders that are in need of addiction services. Based on the Dugosh et al. (2013) study and previous research (Wieczorek, Miller, and Nachajski, 1992), elevated BAC is not a valid indicator of an

alcohol use disorder. Thus, a major change in policies that use BAC as a primary indicator of an addiction problem is strongly justified. Based on current policies, a tremendous amount of treatment resources are likely to be misused on high BAC offenders who do not have an addiction to alcohol, and even more importantly, those offenders at lower BACs who do have a true need for addiction treatment are being missed by the system. DUI offenders report much dissatisfaction with being required to participate in treatment, especially if a meaningful rationale for being assigned to treatment is lacking (Lapham and England-Kennedy, 2012).

The lack of predictive utility for BAC, however, does not obviate the systemic need to identify first offenders that would benefit, by reduced risk for recidivism, from more intensive interventions. The interventions most relevant to specific deterrence from DUI will require a complex system of assessment and programs, and corresponding policies, to be successfully implemented. The study by Dugosh et al. (2013) and previous research on repeat DUI offenders (Nochajski and Stasiewicz, 2006) identify at least two major topics for interventions: alcohol and drug use disorders (addiction problems), and other indicators of higher risk for recidivism (e.g., impulsivity, criminal behaviors, risk taking, and record of high risk driving).

In addition to alcohol addiction, new interventions specific to high-volume drinking (without dependence present) are necessary as the research by Furr-Holden, Voas, Lacey, Romano, and Jones (2011) on a national roadside sample of drivers found that the largest proportion of drivers with impaired BACs were frequent high-volume drinkers who did not qualify for a specific alcohol diagnosis. The use of motivational interviewing interventions (Miller and Rose, 2009) that use a stages-of-change approach that is based on the goals (i.e., motivations) of the DUI offender receiving the counseling should be considered as a policy alternative to traditional alcohol dependence treatment for high-volume drinkers.

No one approach to screening or triaging first DUI offenders can be recommended to guide a specific policy, although Dugosh et al. (2013) identified several addiction items and primarily criminal justice factors that could be predictive of need for treatment to reduce recidivism. Other research (Mann et al., 2009; Shuggi, Mann, Zalcman, Chipperfield, and Nochajski, 2006; Wanberg et al., 2005) has shown that screening approaches such as the Research Institute on Addiction Screening Instrument have the potential to guide the triaging of DUI offenders. Despite this research, no screening or triaging protocol is currently available or suitable (in terms of predictive validity and alignment with state-level laws and regulations) for use in most jurisdictions. There will be a need to adapt the general principle of triaging first DUI offenders to various legal requirements of states and local jurisdictions. The complexity of the triage process to assign accurately first DUI offenders to the most appropriate types of interventions will require policies that incorporate both actuarial and clinical judgment. Actuarial screening approaches should be used as a first approximation of the match for a specific level of intervention, especially decisions to be referred to traditional alcohol and drug addiction treatment programs.

Nonetheless, there is a powerful rationale in favor of policies to screen and triage first DUI offenders. These policies could be limited to specific court jurisdictions or implemented on a statewide basis. A specific policy for DUI offender screening at the highest levels of government organization (e.g., state-level Department of Motor Vehicles and state-level criminal statutes) would enhance the likelihood of a broad, specific deterrent impact. This screening policy could be accomplished through criminal laws enforced by the courts or through administrative regulations that are enforced by the state agency that licenses and regulates drivers. Local policies enforced through judicial discretion, however, are still relevant even when no statewide regulation is in place. Note that policies do not need to be fully formalized by law or regulation. Local courts typically have substantial discretion in assigning sanctions, including screening and treatment. A policy for judicial training to include regular education on how to use the entire range of sanctions and intervention options for DUI offenders could have an impact on reducing recidivism and would be relevant to statewide and local policies. Specifically, the training should emphasize that BAC has highly limited value for assigning DUI offenders to interventions; thus, other methods of triaging these offenders into sanctions and interventions are necessary.

One major issue that pertains to a policy for triaging of first offenders is that effective interventions are needed that align with each risk level assigned during screening. Policies that require screening but result in inappropriate categorization of risk and assignment to ineffective programs undermine the authority of the judicial and the traffic safety regulatory system. Regardless of the lack of universal evidence for any specific screening approach, policies can be developed that provide a flexible system of triage and interventions. The basic tenet is that it is feasible for legislation to encode the primary principles of screening and triage for DUI offenders that can allow the systems to adapt over time as research provides further guidance as to those specific interventions that are most efficacious for each level of risk. A component of this policy is a requirement to evaluate systematically the impact of the interventions on DUI recidivism over a reasonable time frame (e.g., every 5 years). The evaluation should be done both locally and statewide because there is likely to be variation in the effectiveness of the policies and how they are implemented across local jurisdictions and over time. The judicial or regulatory system that is implementing the DUI triaging and related interventions also should have a policy to assess program fidelity, processes, and impacts in a continuous quality improvement cycle; otherwise, outdated and ineffective systems will remain in place.

Summary

Dugosh et al. (2013) found that BAC does not seem to be related to DUI recidivism; this finding has great relevance to policies that make decisions based on BAC. It has relevance for both the general and the specific deterrence of DUI. For general deterrence, this finding may provide indirect support for sustaining current laws that impose differentially more severe penalties on offenders with higher BAC levels. The implications for specific deterrence of

DUI are more complex. The main policy impact is to reject the use of BAC as an indicator of the need for addictions treatment. This rejection leads to the identification of policies that are relevant to specific deterrence among all first DUI offenders. The lack of validity for BAC as a screener for treatment also leads to a cascade of other policy implications. For example, general policy guidelines for triaging DUI offenders by risk can be achieved through a variety of approaches. To reduce DUI recidivism, policies are needed to support the development, evaluation, and management of a system of assessment and linkage to effective interventions.

References

American Psychiatric Association. 2000. *Diagnostic and Statistical Manual of Mental Health Disorders*, 4th Edition. Washington DC: Author.

Berger, Dale H. and John R. Snortum. 1986. A structural model of drinking and driving: Alcohol consumption, social norms, and moral commitments. *Criminology*, 24: 139–154.

Donovan, Dennis M., Gordon A. Marlatt, and Philip M. Salzberg. 1983. Drinking behavior, personality factors and high-risk driving. *Journal of Studies on Alcohol*, 44: 395-428.

Dugosh, Karen L., David S. Festinger, and Douglas B. Marlowe. 2013. Moving beyond BAC in DUI: Identifying who is at risk of recidivating. *Criminology & Public Policy*, 12: 181–193.

Elder, Randy W., Robert Voas, Doug Beirness, Ruth A. Shults, David A. Sleet, James L. Nichols, and Richard Compton. 2011. Effectiveness of ignition interlocks for preventing alcohol-impaired driving and alcohol-related crashes. *American Journal of Preventive Medicine*, 40: 362–376.

Furr-Holden, C. Debra, Robert B. Voas, John Lacey, Eduardo Romano, and Kristina Jones. 2011. The prevalence of alcohol use disorders among night-time weekend drivers. *Addiction*, 106: 1251–1260.

Lapham, Sandra and Elizabeth England-Kennedy. 2012. Convicted driving-while-impaired offenders' views on effectiveness of sanctions and treatment. *Qualitative Health Research*, 22: 17–30.

Mann, Robert E., Gina Stoduto, Rosely F. Zalcman, Thomas H. Nochajski, Louise Hall, Patricia Dill, and Elisabeth Wells-Parker. 2009. Examining factors in the Research Institute on Addictions Self-Inventory (RIASI): Associations with alcohol use and problems at assessment and follow-up. *International Journal of Environmental Research and Public Health*, 6: 2898–2918.

Miller, William R. and Gary S. Rose. 2009. Toward a theory of motivational interviewing. *American Psychologist*, 64: 527–537.

Nagin, Daniel S. and Greg Pogarsky. 2001. Integrating celerity, impulsivity, and extralegal sanction threats into a model of general deterrence: Theory and evidence. *Criminology*, 39: 865–892.

Nochajski, Thomas H. and Paul R. Stasiewicz. 2006. Relapse to driving under the influence (DUI): A review. *Clinical Psychology Review*, 26: 179–195.

Shuggi, Rania, Robert E. Mann, Rosely F. Zalcman, Brenda Chipperfield, and Thomas Nochajski. 2006. Predictive validity of the RIASI: Alcohol and drug use and problems six months following remedial program participation. *American Journal of Drug and Alcohol Abuse*, 32: 121–133.

Simpson, H. M., D. J. Beirness, R. D. Robertson, D. R. Mayhew, and J. H. Hedlund. 2004. Hard core drinking drivers. *Traffic Injury Prevention*, 5: 261–269.

Voas, Robert B., Robert L. DuPont, Stephen K. Talpins, and Corinne L. Shea. 2011. Toward a national model for managing impaired driving offenders. *Addiction*, 106: 1221–1227.

Voas, Robert B. and John H. Lacey. 1990. Drunk driving enforcement, adjudication, and sanctions in the United States. In (R. Jean Wilson and Robert E. Mann, eds.), *Drinking and Driving: Advances in Research and Prevention*. New York: Guilford Press.

Wanberg, Kenneth W., Harvey B. Milkman, and David S. Timken. 2005. *Driving With Care: Alcohol, Other Drugs, and Impaired Driving Offender Treatment–The Provider's Guide*. Thousand Oaks, CA: Sage.

Wieczorek, William F. and Thomas H. Nochajski. 2005. Characteristics of persistent drinking drivers: Comparisons of first, second, and multiple offenders. In (Dwight A. Hennessy and David L. Wiesenthal, eds.), *Contemporary Issues in Road User Behavior and Traffic Safety*. New York: Nova Science.

Wieczorek, William F., Brenda A. Miller, and Thomas H. Nochajski. 1992. The limited utility of BAC for identifying alcohol problems among DWI offenders. *Journal of Studies on Alcohol*, 53: 415-419.

Zador, Paul L., Sheila A. Krawchuk, and Robert B. Voas. 2000. Alcohol-related relative risk of driver fatalities and driver involvement in fatal crashes in relation to driver age and gender: An update using 1996 data. *Journal of Studies on Alcohol*, 61: 387–395.

William F. Wieczorek is the Director of the Center for Health and Social Research at the State University of New York College at Buffalo. In addition to his work on impaired driving, Dr. Wieczorek's research interests include community health needs assessments, epidemiology of alcohol and drug use, prevention of drug/alcohol abuse, advanced GIS applications, spatial models, factors in suicide, evaluation of alcohol/drug abuse prevention programs, problem gambling, and applied health promotion projects. He has published over 80 peer-reviewed articles and chapters on these topics. Dr. Wieczorek is a regular reviewer of National Institutes of Health grants and is currently the Chair of the National Institute on Alcohol Abuse and Alcoholism Initial Review Group, Epidemiology, Prevention and Behavior Research Review Subcommittee.

Deterring DUI Behavior in the First Place

A Bigger Bang for the Buck?

James C. Fell

Robert B. Voas

Pacific Institute for Research and Evaluation

Dugosh, Festinger, and Marlowe's (2013, this issue) study is an important pilot study aimed at the development of a brief screening device that contains objective items to predict recidivism. We must continue to develop criteria that will help us distinguish between driving-under-the-influence (DUI) offenders who are at significant risk of repeating the offense in contrast to those offenders who learn their lesson from the first offense and never repeat the offense, no matter what sanction they experience. The identification of offenders with a high risk of repeating the offense will help prosecution and adjudication officials assign appropriate sanctions for the offense and implement appropriate monitoring of the offenders to prevent recidivism. Studies have shown that approximately one third of all offenders arrested for DUI are repeat offenders (Fell, 1995; Fell, Tippetts, and Voas, 2010) and that drivers with a DUI offense are at approximately four times the risk of being alcohol positive in a fatal crash (Fell, 1992). If we can accurately identify those first-time DUI offenders at high risk of repeating, then countermeasures can be implemented to prevent the recidivism. This approach will improve public safety.

Although identifying high-risk offenders is certainly important, it must be recognized that, as Dugosh et al. (2013) note, the criminal justice system continues to apply remedial programs based primarily on prior offenses and the blood-alcohol concentration (BAC) at the time of arrest. This process occurs despite the availability of screening tests with reasonable validity. The use of such assessment instruments was popularized 40 years ago by the National Highway Traffic Safety Administration's (NHTSA's) national Alcohol Safety Action Program (ASAP) implemented in 35 communities in the United States between 1969 and 1975. Currently, however, using these instruments has been restrained, not by the lack of useful test instruments but by the lack of court personnel resources to administer them (Voas and Fisher, 2001). As an example, it has been difficult to persuade adjudication

Direct correspondence to James C. Fell, Pacific Institute for Research and Evaluation, 11720 Beltsville Drive, Suite 900, Calverton, MD 20705-3111 (e-mail: fell@pire.org).

DOI:10.1111/1745-9133.12035

officials to use the four-question instrument of the CAGE questionnaire (Ewing, 1984) that reliably identifies problem drinkers who have a high risk of recidivating. The instrument developed by the Dugosh et al. (2013) article has 26 questions, plus the time it will take for scoring. Thus, implementation will require additional resources for most courts. How many courts will do so in this era of shrinking resources to control impaired driving? We estimate that only a few will do so and not enough to reduce the DUI problem in the United States.

There are 212,000,000 licensed drivers in the United States (Office of Highway Policy Information, 2013). Approximately 22% of these licensed drivers report driving within 2 hours of drinking alcohol within the past year (Royal, 2003). This translates to 46,600,000 drivers who take alcohol-impaired driving trips each year. According to the drinking-driving survey of 2001 (Royal, 2003), drinking drivers made between 809 million and 1 billion driving trips after drinking alcohol. A recent article on alcohol-impaired driving concludes that "whatever the level of blood alcohol concentration (BAC) examined, at least some skills can be demonstrated to be significantly impaired" (Martin et al., 2013: 10).

In the United States, approximately 1,400,000 drivers are arrested each year for DUI (Federal Bureau of Investigation, 2013), and approximately 1,000,000 are convicted of the crime. Even if we can identify precisely the 300,000 offenders who are at a high risk of recidivism, how many can be prevented? What specific deterrence measures can be instituted to ensure they do not repeat? Mandating ignition interlocks on offenders' vehicles for several years or for life might work, but will that be accepted by the courts based on a 26-question instrument?

Another approach is to try to deter drivers from driving impaired in the first place. This option is called a general deterrent strategy and has the potential to affect a substantial number of drinking drivers. Attempting to identify the 300,000 DUI offenders with a high risk of reoffending and preventing them from repeating the offense, at best, will affect just those 300,000 drivers. On the other hand, if strategies can be implemented that generally deter some portion of the current 46,000,000 drivers from driving after drinking, then it most certainly will have a greater effect on the problem. If the current number of drinking drivers can be reduced by 20%, then 9,320,000 drivers will be affected as opposed to the 300,000 drivers who were prevented from repeating. Is that option not more cost-effective?

What general deterrent strategies work to reduce alcohol-impaired driving? This policy essay provides a description of three evidence-based strategies that work: implementing sobriety checkpoints, lowering the illegal BAC limit to 0.05, and screening and brief alcohol interventions in medical facilities.

Implementing Sobriety Checkpoints

Studies of sobriety checkpoints in the United States have found that they are associated with significant decreases in alcohol-related crashes (Epperlein, 1987; Lacey et al., 1986; Levy, Asch, and Shea, 1990; Levy, Shea, and Asch, 1988; Voas, 2008; Voas, Rhodenizer, and Lynn, 1985; Wells, Preusser, and Williams, 1992). Four reviews of checkpoint programs have been

published. Peek-Asa (1999) reviewed six studies that were conducted between 1983 and 1996 and reported reductions of 17% to 75% in alcohol-related fatalities. Two related meta-analyses studies of 15 U.S. checkpoint programs were conducted between 1985 and 1999 by Shults et al. (2001) and Elder and Shults (2002). Elder and Shults (2002) found that the median reduction in crashes associated with checkpoints was 20%. A survey of state checkpoint operations by Fell, Lacey, and Voas (2004) reported effectiveness figures similar to those of Elder and Shults (2002). A cost–benefit study of sobriety checkpoints indicated that for every $1 invested in the checkpoint strategy, the community conducting the checkpoint saved $6 (Miller, Galbraith, and Lawrence, 1998). In a recent report published by the Transportation Research Board (TRB) of the National Academies of Science (TRB, 2010), the lessons from other nations indicate that frequent and sustained use of sobriety checkpoints could save up to 3,000 lives annually if similarly used in the United States.

Lowering the Illegal BAC Limit to 0.05

On May 14, 2013, the National Transportation Safety Board (NTSB), an independent federal agency dedicated to promoting transportation safety, issued a report recommending, among other measures, that states should lower the illegal BAC limit for driving from 0.08 to 0.05 (NTSB, 2013). The NTSB provided a sound rationale and concluded that lowering the BAC limit to 0.05 or lower has a strong evidence-based foundation. At least 91 countries around the world have adopted a 0.05 BAC or lower limit for driving, and 54 countries have established illegal limits of 0.06 to 0.12 BAC. The rationale behind adopting a 0.05 BAC law includes the following:

1. The driving performance of virtually all drivers is impaired at 0.05 BAC. Laboratory and test-track research has shown that most drivers, even experienced drinkers, who typically reach BACs of 0.15 or greater are impaired at 0.05 BAC and higher regarding critical driving tasks (Ferrara, Zancaner, and Georgetti, 1994; Moskowitz and Fiorentino, 2000; Moskowitz, Burns, Fiorentino, Smiley, and Zador, 2000). Significant decrements in performance in areas such as braking, steering, lane changing, judgment, and divided attention occur at 0.05 BAC. Some studies have reported that performance decrements in some of these tasks are as high as 30% to 50% at 0.05 BAC.
2. The risk of being involved in a crash increases significantly at 0.05 BAC, and at each positive BAC level exceeding 0.05, the risk of being involved in a crash increases rapidly compared with drivers with no alcohol in their blood systems (Blomberg, Peck, Moskowitz, Burns, and Fiorentino, 2005). Recent studies have indicated that the relative risk of being killed in a single-vehicle crash for drivers with BACs of 0.05 to 0.079 is at least 7 times that of drivers at 0.00 BAC (no alcohol) and could be as much as 21 times that of drivers at 0.00 BAC, depending on the age of the driver (Voas, Torres, Romano, and Lacey, 2012). These risks are significant.

3. Lowering the illegal per se limit to 0.05 BAC is a proven and effective countermeasure that has reduced alcohol-related traffic fatalities in other countries, most notably, Australia. Although studies in Europe and Australia each use a different methodology to evaluate these effects, the evidence is consistent and persuasive that fatal and injury crashes involving drinking drivers decrease at least 5% to 8% and up to 18% after a country lowers its illegal BAC limit from 0.08 to 0.05 BAC (Bartl and Esberger, 2000; Brooks and Zaal, 1992; Homel, 1994; Smith, 1988). If all states were to adopt the 0.05 BAC standard and it were enforced, then an estimated 500 to 800 lives could be saved each year (Wagenaar, Maldonado-Molina, Ma, Tobler, and Komro, 2007).
4. Setting a 0.05 BAC is a reasonable standard. A 0.05 BAC is not typically reached with a couple of beers after work or with a glass of wine or two with dinner. It takes at least four drinks for the average 170-pound male to exceed 0.05 BAC in 2 hours on an empty stomach (three drinks for the 137-pound female). The BAC level reached depends on a person's age, gender, weight, consumption of food, and metabolic rate (National Highway Traffic Safety Administration, 2005). No matter how many drinks it takes to reach 0.05 BAC, people at this level are too impaired to drive safely.
5. The public supports levels below 0.08 BAC. NHTSA's surveys show that most people would not drive after consuming two or three drinks in an hour (Royal, 2003) and believe the limit should be no higher than the BAC level associated with that. That would be 0.05 BAC or lower for most drivers.
6. Most other industrialized nations around the world have set BAC limits at 0.05 BAC or lower. All states in Australia now have a 0.05 BAC limit. Austria, France, Germany, Italy, and Spain lowered their limit to 0.05 BAC, and Japan, Norway, Russia, and Sweden have set their limit at 0.02 BAC.
7. More progress is needed in reducing alcohol-impaired driving. It has been 30 years since the first two states adopted a 0.08 BAC limit and 13 years since federal legislation provided a strong incentive to adopt a 0.08 BAC limit. Progress in reducing impaired driving has stalled over the past 15 years. Lowering the BAC limit from 0.08 to 0.05 will serve as a general deterrent to all those who drink and drive and will show that the state is getting tougher on impaired driving and will not tolerate it. Such legislation typically reduces drinking drivers in fatal crashes at all BAC levels (BACs> 0.01; BACs> 0.05; BACs> 0.08; BACs> 0.15).

Screening and Brief Alcohol Interventions in Medical Facilities

The best opportunity for deterrence using Dugosh et al.'s (2013) 26-question short assessment instrument may be in health settings. Rapid screening instruments that can be administered by nonclinically trained personnel can provide a basis for referral to brief interventions in conjunction with educational, administrative, or general health programs. These brief interventions lend themselves to delivering messages directed at influencing the drinking of individuals who may be at risk from drinking alcohol but are unaware of their

problem or at least are not actively seeking a solution. This individually oriented technique generally involves providing personal feedback to individuals on the relation of their drinking to the drinking of their peers or general normative behavior, together with the potential health consequences of continuing to over consume (Barnett, Monti, and Wood, 2001; Ritson, 2005). Brief interventions are generally directed at high-risk drinkers who have yet to suffer harm from their drinking and are not actively seeking help. To date, brief interventions directed at such risky drinkers (heavy drinkers and binge drinkers) have primarily been offered through college-student health programs and in primary care facilities.

Perhaps the most important underused opportunity to treat people with alcohol abuse problems typically rests with their primary care physician or related nursing staff (Gentilello, 2005; Solberg, Maciosek, and Edwards, 2008). Historically, physicians have not routinely provided screening and brief interventions because of time limitations, resources, and information on effectiveness. In addition, restrictions set on reimbursement by health insurance providers and the limited training of physicians in alcohol-counseling methods tend to minimize brief interventions by physicians on drinking practices. This could change because Medicare, the federal health insurance program for seniors, changed its rules as of 2007 regarding payment for such counseling. Primary care facilities offer a particularly good opportunity because less expensive, skilled medical support personnel may be more available for conducting interventions. Nurses are ideal service providers because they are highly skilled, have a higher level of contact with potential brief intervention recipients (Dyehouse and Sommers, 1995), and are less costly than physicians.

Brief interventions have decreased problem drinking across many settings and populations (Sommers, Dyehouse, and Howe, 2001). These interventions include medical settings for nonacute care, such as primary care offices (Bien, Miller, and Tonigan, 1993; Fleming, Barry, Manwell, Johnson, and London, 1997). Controlled studies in primary care settings have shown that brief interventions can effectively decrease alcohol use (Bien et al., 1993), alcohol-related problems (Israel et al., 1996), healthcare utilization, and overall consumption (Fleming et al., 1997; Israel et al., 1996). Solberg et al. (2008) conducted a meta-analysis of 10 evaluation reports of brief intervention programs by primary physicians and found that they were effective in reducing heavy drinking by an average of 17.3% and hazardous drinking by a comparable 17.6%.

In summary, whereas specific deterrent strategies such as those proposed by Dugosh et al. (2013) to reduce recidivism have merit, general deterrent strategies provide a much greater "bang for the buck" in reducing impaired driving. With limited resources to counter impaired driving, efficient and effective solutions must prevail. We have described three general deterrent strategies that can potentially reduce impaired-driving fatalities substantially.

References

Barnett, Nancy P., Peter M. Monti, and Mark D. Wood. 2001. Motivational interviewing for alcohol-involved adolescents in the emergency room. In (Eric F. Wagner

and Holly B. Waldron, eds.), *Innovations in adolescent substance abuse interventions*. Oxford, U.K.: Elsevier. Retrieved September 2006 from elsevier.com/wps/find/bookdescription.cws_home/622189/description#description.

Bartl, G. and R. Esberger. 2000. Effects of lowering the legal BAC limit in Austria. In (H. Laurell and F. Schlyter, eds.), *Proceedings of the 15th International Conference on Alcohol, Drugs and Traffic Safety - T'2000*, May 22–26, 2000. Stockholm, Sweden: International Council on Alcohol, Drugs and Traffic Safety (ICADTS).

Bien, Thomas H., William R. Miller, and J. Scott Tonigan. 1993. Brief interventions for alcohol problems: A review. *Addiction*, 88: 315–336.

Blomberg, Richard D., Raymond C. Peck, Herbert Moskowitz, Marcelline Burns, and Dary Fiorentino. 2005. *Crash Risk of Alcohol Involved Driving: A Case-Control Study*. Stamford, CT: Dunlap. Retrieved from dunlapandassociatesinc.com/crashriskofalcoholinvolveddriving.pdf.

Brooks, Chris and Dominic Zaal. 1992. *Effects of a 0.05 Alcohol Limit in the Australian Capital Territory*. Canberra, Australia: Federal Office of Road Safety MR 10.

Dugosh, Karen L., David S. Festinger, and Douglas B. Marlowe. 2013. Moving beyond BAC in DUI: Identifying who is at risk of recidivating. *Criminology & Public Policy*, 12: 181–193.

Dyehouse, Janice M. and Marilyn Sawyer Sommers. 1995. Brief intervention as an advanced practice strategy for seriously injured victims of multiple trauma. *AACN Advanced Critical Care*, 6: 53–62.

Elder, Randy W. and Ruth A. Shults. 2002. Involvement by young drivers in fatal alcohol-related motor vehicle crashes—United States, 1982–2001. *Morbidity and Mortality Weekly Report*, 51: 1089–1091.

Epperlein, Thomas. 1987. Initial deterrent effects of the crackdown on drunken drivers in the state of Arizona. *Accident Analysis and Prevention*, 19: 271–283.

Ewing, John A. 1984. Detecting alcoholism: The CAGE questionnaire. *Journal of the American Medical Association*, 252: 1905–1907.

Federal Bureau of Investigation. 2013. *Uniform Crime Reports*. Clarksburg, WV: Federal Bureau of Investigation. Retrieved August 10, 2013 from fbi.gov/about-us/cjis/ucr/crime-in-the-u.s/2011/crime-in-the-u.s.-2011/tables/table-29.

Fell, James C. 1992. Repeat DWI offenders involvement in fatal crashes. *Traffic Tech, NHTSA Technology Transfer Series*, 23.

Fell, James C. 1995. Repeat DWI offenders in the United States. *Traffic Tech, NHTSA Technology Transfer Series No. 85*. Retrieved from nhtsa.gov/people/outreach/traftech/1995/TT085.htm.

Fell, James C., John H. Lacey, and Robert B. Voas. 2004. Sobriety checkpoints: Evidence of effectiveness is strong, but use is limited. *Traffic Injury Prevention*, 5: 220–227.

Fell, James C., Scott Tippetts, and Robert B. Voas. 2010. Drinking characteristics of drivers arrested for driving while intoxicated in two police jurisdictions. *Traffic Injury Prevention*, 11: 443–452.

Ferrara, S.D., S. Zancaner, and R. Georgetti. 1994. Low blood alcohol levels and driving impairment: A review of experimental studies and international legislation. *International Journal of Legal Medicine*, 106: 169–177.

Fleming, Michael F., Kristen Lawton Barry, Linda Baier Manwell, Kristen Johnson, and Richard London. 1997. Brief physician advice for problem drinkers: A randomized controlled trial in community-based primary care practices. *Journal of the American Medical Association*, 277: 1039–1045.

Gentilello, Larry M. 2005. Alcohol intervention in trauma centers: The opportunity and the challenge. *The Journal of Trauma*, 59: S18–S20.

Homel, Ross. 1994. Drink-driving law enforcement and the legal blood alcohol limit in New South Wales. *Accident Analysis and Prevention*, 26: 147–155.

Israel, Yedy, Oscar Hollander, Martha Sanchez-Craig, Suzanne Booker, Virginia Miller, Ronald Gingrich, et al. 1996. Screening for problem drinking and counseling by the primary care physician-nurse team. *Alcoholism: Clinical and Experimental Research*, 20: 1443–1450.

Lacey, John H., J.R. Stewart, Lauren M. Marchetti, Carol L. Popkin, P.V. Murphy, Roy E. Lucke, and Ralph K. Jones 1986. Enforcement and public information strategies for DWI general deterrence: Arrest drunk driving: The Clearwater and Largo, Florida, experiences (HS-807-066). Washington, DC: National Highway Traffic Safety Administration.

Levy, David T., Peter Asch, and Dennis Shea. 1990. An assessment of county programs to reduce driving while intoxicated. *Health Education Research*, 5: 247–255.

Levy, David T., Dennis Shea, and Peter Asch. 1988. Traffic safety effects of sobriety checkpoints and other local DWI programs in New Jersey. *American Journal of Public Health*, 79: 291–293.

Martin, Teri L., Patricia A.M. Solbeck, Daryl J. Mayers, Robert M. Langille, Yvona Buczek, and Marc R. Pelletier. 2013. A review of alcohol-impaired driving: The role of blood alcohol concentration and complexity of the driving task. *Journal of Forensic Sciences*, e1–e13.

Miller, Ted R., Maury Galbraith, and Bruce A. Lawrence. 1998. Costs and benefits of a community sobriety checkpoint program. *Journal of Studies on Alcohol*, 59: 465–468 [Reprinted in Albert N. Link and John T. Scott, eds. 2011. *The Economics of Evaluation in Public Programs, International Library of Critical Writings in Economics*. Cheltenham, U.K.: Edward Elgar.]

Moskowitz, Herbert, Marceline Burns, Dary Fiorentino, Allison Smiley, and Paul Zador. 2000. *Driver Characteristics and Impairment at Various BACs* (DOT HS 809 075). Washington, DC: U.S. Department of Transportation, National Highway Traffic Safety Administration.

Moskowitz, Herbert and Dary Fiorentino. 2000. *A Review of the Literature on the Effects of Low Doses of Alcohol on Driving-Related Skills* (DOT HS 809 028). Washington, DC: U.S. Department of Transportation, National Highway Traffic Safety Administration.

National Highway Traffic Safety Administration. 2005. *The ABCs of BAC: A Guide to Estimating Blood Alcohol Concentration and Alcohol Impairment* (DOT HS 809 844). Washington, DC: Department of Transportation.

National Transportation Safety Board (NTSB). 2013. *Reaching Zero: Actions to Eliminate Alcohol-Impaired Driving* [Safety Report] (NTSB/SR-13/01 PB2013-106566). Washington, DC: National Transportation Safety Board. Retrieved from ntsb.gov/doclib/reports/2013/SR1301.pdf.

Office of Highway Policy Information. 2013. *Highway Statistics Series: Licensed Drivers by Sex and Ratio to Population—2011*. Washington, DC: U.S. Department of Transportation, Federal Highway Administration. Retrieved August 10, 2013 from fhwa.dot.gov/policyinformation/statistics/2011/dl1c.cfm.

Peek-Asa, Corinne. 1999. The effect of random alcohol screening in reducing motor vehicle crash injuries. *American Journal of Preventive Medicine*, 16: 57–67.

Ritson, Bruce. 2005. Treatment for alcohol-related problems. *British Medical Journal*, 330: 139. Retrieved June 22, 2006 from bmj.bmjjournals.com/cgi/content/full/330/7483/139.

Royal, Dawn. 2003. *Volume I: Summary Report—2001 National Survey of Drinking and Driving* (DOT HS 809 549). Washington, DC: National Highway Traffic Safety Administration, U.S. Department of Transportation.

Shults, Ruth A., Randy W. Elder, David A. Sleet, James L. Nichols, Mary O. Alao, Vilma G. Carande-Kulis, et al. 2001. Reviews of evidence regarding interventions to reduce alcohol-impaired driving. *American Journal of Preventive Medicine*, 21: 66–88.

Smith, D.I. 1988. Effect on traffic safety of introducing a 0.05% blood alcohol level in Queensland, Australia. *Medicine, Science and Law*, 28: 165–170.

Solberg, Leif I., Michael V. Maciosek, and Nichol M. Edwards. 2008. Primary care intervention to reduce alcohol misuse: Ranking its health impact and cost effectiveness. *American Journal of Preventive Medicine*, 34: 143–152.

Sommers, Marilyn Sawyer, J. M. Dyehouse, and S. R. Howe. 2001. Binge drinking, sensible drinking, and abstinence after alcohol-related vehicular crashes: The role of intervention versus screening. *Annual Proceedings of the Association for Advanced Automotive Medicine*, 45: 317–328.

Transportation Research Board (TRB). 2010. *Special Report 300. Achieving Traffic Safety Goals in the United States: Lessons from Other Nations*. Washington, DC: Transportation Research Board of the National Academies of Science, Committee for the Study of Traffic Safety Lessons from Benchmark Nations.

Voas, Robert B. 2008. A new look at NHTSA's evaluation of the 1984 Charlottesville Sobriety Checkpoint Program: Implications for current checkpoint issues. *Traffic Injury Prevention*, 9: 22–30.

Voas, Robert B. and Deborah A. Fisher. 2001. Court procedures for handling intoxicated drivers. *Alcohol Research and Health*, 25: 32–42.

Voas, Robert B., A. Eugene Rhodenizer, and Cheryl Lynn. 1985. *Evaluation of Charlottesville Checkpoint Operations*. Washington, DC: National Highway Traffic Safety

Administration. (Available in hard copy format only from the National Technical Information Service, Springfield, VA.)

Voas, Robert B., Pedro Torres, Eduardo Romano, and John H. Lacey. 2012. Alcohol-related risk of driver fatalities: An update using 2007 data. *Journal of Studies on Alcohol and Drugs*, 73: 341–350.

Wagenaar, Alexander C., Mildred M. Maldonado-Molina, Linan Ma, Amy L. Tobler, and Kelli A. Komro. 2007. Effects of legal BAC limits on fatal crash involvement: Analyses of 28 states from 1976 through 2002. *Journal of Safety Research*, 38: 493–499.

Wells, JoAnn K., David F. Preusser, and Allan F. Williams. 1992. Enforcing alcohol-impaired driving and seat belt use laws, Binghamton, New York. *Journal of Safety Research*, 23: 63–71.

James C. Fell is a Senior Research Scientist with the Pacific Institute for Research and Evaluation (PIRE) in Calverton, MD. He recently completed research on the effectiveness of graduated driver licensing laws under a grant from the National Institute of Child Health and Human Development (NICHHD) and studies on responsible beverage service, alcohol ignition interlock laws, high visibility enforcement and alcohol monitoring devices on impaired driving offenders for the National Highway Traffic Safety Administration (NHTSA). He is currently finishing a grant from the National Institute on Alcohol Abuse and Alcoholism (NIAAA) studying the effects of underage drinking laws and intense impaired driving enforcement on drinking and driving. Mr. Fell formerly worked at NHTSA from 1969 to 1999 and has 46 years of traffic safety and alcohol research experience. He has both a Bachelor's and Master's degree in Human Factors Engineering from the State University of New York at Buffalo. Mr. Fell is a member of the International Council on Alcohol, Drugs, and Traffic Safety (ICADTS); the Association for the Advancement of Automotive Medicine (AAAM); the Research Society on Alcoholism (RSA); and the Human Factors and Ergonomics Society (HFES). He received the Widmark Award from ICADTS in 2013 for outstanding, sustained, and meritorious contribution to the field of alcohol, drugs, and traffic safety.

Robert B. Voas has been involved in research on alcohol and highway safety for 40 years, initially as director of the National Highway Traffic Safety Administration's Office of Program Evaluation and more recently as Principal Investigator for government funded research programs as a Senior Research Scientist at the Pacific Institute for Research and Evaluation. His recent work has encompassed studies of impaired driving laws, law enforcement, underage drinking, vehicle alcohol interlocks, drugged driving, and court procedures for monitoring DUI offenders. He is a past president and a Widmark Lauriat of the International Council on Alcohol Drugs and traffic Safety and has received The James Howard Trailblazer Award from the Governor's Highway Safety Association and the Lifetime Achievement Award from the Research Society on Alcoholism.

DUI RECIDIVISM

If I Had a Hammer, I Would Not Use it to Control Drunk Driving

Using Predictive Tools to Respond to Persistent Drunk Driving

Matthew DeMichele
RTI International

Brian Payne
Old Dominion University

The classic song "The hammer song" by Pete Seeger and Lee Hays (1949b) includes lyrics that tell us how the musicians proposed using a hammer. The rendition by Peter, Paul, and Mary ("If I had a hammer," Seeger and Hays, 1949a) who sung about hammering all over the land all day long is particularly well known. Of course, they were not really going to use the hammer the way they suggested; instead, the hammer was a metaphor for peace and civility. The way that criminal justice professionals use tools, however, is not metaphoric and has real implications for the lives of offenders, criminal justice professionals, and community members. It is within this framework that one can realize the importance of Dugosh, Festinger, and Marlowe's (2013, this issue) study.

Criminologists have paid relatively little attention to explaining chronic drunk driving. Therefore, Dugosh et al. (2013) are to be commended for their contribution to the criminological literature with their study of the differences between one-time and recidivist driving-under-the-influence (DUI) offenders. The current consensus explaining DUI recidivism relies on substance abuse and blood alcohol concentration (BAC) on arrest. Dugosh et al. point to the need for the community corrections field to have a short predictive instrument to classify DUI offenders. They argue that BAC, although correlated with DUI recidivism, "alone should . . . not be used as a sole determinant for increasing the severity of a DUI offender's case disposition." Furthermore, Dugosh et al. cite the overly clinical orientation,

Direct correspondence to Matthew DeMichele, Crime, Violence, and Justice Research Program, RTI International, 3040 Cornwallis Road, P.O. Box 12194, Research Triangle Park, NC 27709-2194 (e-mail: mdemichele@rti.org).

DOI:10.1111/1745-9133.12039

technical administration, and time-consuming nature of several substance abuse screeners that makes them too complicated for classification within a community corrections setting. Therefore, they set out to provide the "initial systematic effort to develop a risk and need-based screening tool" with the "purpose . . . to identify empirically supported predictors of risk and treatment need that discriminate between first-time and repeat DUI offenders."

The rationale for Dugosh et al.'s (2013) study is well founded, as we have been working on a similar endeavor to develop an instrument to classify DUI offenders (DeMichele and Lowe, 2011, 2012; DeMichele, Lowe, and Payne, 2013a, 2013b; DeMichele and Payne, 2012).[1]

Although we agree about the importance of using predictive tools to respond to drunk driving, we believe more discussion is needed surrounding which tools are used, how they are created, why they are used in certain situations, and how these tools fit into broader efforts to control drunk driving. We use information about methodological "tools" and draw on previous research by quantitative criminologists (Lattimore, MacDonald, Piquero, Linster, and Visher, 2004; Nagin and Land, 1993; Osgood, 2000), theoretical criminologists (Moffit, 1993), and criminologists studying prediction (Berk, 2011; Silver and Chow-Martin, 2001) to further discussion about Dugosh et al.'s (2013) study.

The following list provides some basic comments about predictive tools:

- If used inappropriately, or for the wrong reasons, predictive tools can make problems worse.
- Different people use different predictive tools.
- Predictive tools should be developed by focusing on the causes of problems.
- It is imperative that the right predictive tools are used to build future tools.
- Predictive tools need to have warnings attached to their labels.

Next, we discuss how these "tool themes" help us to understand efforts to develop risk-assessment instruments designed to identify persistent drunk drivers.

If Used Inappropriately, or for the Wrong Reasons, Predictive Tools Can Make Problems Worse

For those who are fans of the 1990s television show "Home Improvement," few episodes went by without Tim Taylor using a tool incorrectly. Although it may have been amusing to watch "the toolman" hurt himself on television, in reality, the use of "dangerous" tools is no laughing matter. Some may wonder how drunk-driving risk-assessment tools can be

1. Much of this research has been supported, in part, by the National Highway Traffic Safety Administration, as a collaborative effort with the American Probation and Parole Association (APPA). This research involves several coauthors and has benefited from the involvement of several probation departments across the country and the ongoing support from APPA. Further support and assistance was provided by Doris MacKenzie and Penn State University's Justice Center for Research.

dangerous. Obviously, the possibility of not identifying a drunk driver who recidivates as a future recidivist poses a danger to the community, just as falsely identifying the nonrecidivists as future drunk drivers can be damaging to offenders and waste resources. But the need to call into question the appropriate use of drunk-driving tools, from our perspective, lies not on assumptions about traditional Type 1 and Type 2 errors, but in the misguided use of predictive tools to punish offenders rather than treat them.

Dugosh et al. (2013) indicate that the triage tool could "help to inform and refine policy and sentencing guidelines." It is one thing to use risk-assessment tools to inform and refine policy, but it is quite another to use the tools to inform sentencing guidelines. Were one to use assessment tools to promote punitive sentences, the underlying assumption would be that punishment works. Such an assumption counters a large body of research that has shown that punitive approaches in and of themselves do little to limit future behavior. In fact, it is plausible that punishment causes additional misdeeds. On the most basic level, one could argue that the fact that so many punished offenders do, in fact, recidivate suggests that punishment—alone—cannot deter misdeeds that have complex causes.

A related philosophical issue also surfaces when developing risk-assessment tools that could be used for sentencing persistent drunk-driving offenders. Put simply, although substance abuse instruments are not adequate predictors of repeat drunk driving, many drunk drivers do have substance abuse problems. It is telling that the substance abuse indicators that Dugosh et al. (2013) found to be more prevalent in repeat drunk drivers are essentially indicators of alcoholism (e.g., binge use, cravings, substance-abuse related injuries, and withdrawal symptoms). Using a predictive tool that would measure alcoholism to support criminal sentences runs the risk of criminalizing a disease. Alternatively, such a predictive tool would have great potential in promoting appropriate supervision and treatment strategies. The basic point here is that predictive drunk-driving tools should not be used primarily to punish offenders; instead, the tools should be used to guide the development of supervision and treatment plans.

Different Professionals Use Different Tools, or At Least They Should

Also, it is important to recognize that different criminal justice professionals will use different tools in their efforts to respond to drunk drivers. Consider a construction site as an analogy. Construction workers from across the site will use different tools in building various structures. Plumbers use one set of tools, painters use another set of tools, welders use another set of tools, and so on. In considering the criminal justice response to drunk driving, it can be suggested that different criminal justice professionals will need to use different tools. Police officers use breathalyzers and other tools to monitor alcohol use. Prosecutors will use a different set of tools to prove that a crime was committed. Probation and parole officers will use a different set of tools to supervise and manage offenders. Officials in institutional corrections will (or at least should) use a different set of tools. Treatment providers also should use a different set of tools.

One problem that has arisen is that the tools that have been designed for one part of the response to substance abusers are now being used for other parts of the criminal justice process. Substance abuse screens are effective at identifying those who are at a high risk of future drug abuse. Imagine if a welder tried using a hammer to weld materials together. The welder's boss would likely test the welder for drug use! Using tools designed for one function for a different function in the criminal justice system is just as shortsighted. Still, this practice seems to be commonplace.

Tools Should Be Developed by Focusing on the Causes of Drunk Driving

In developing risk-assessment tools to respond to drunk driving, it is important that criminological efforts explore the criminological factors that lead to the problem. Criminologists should treat the study of persistent drunk driving like other forms of crime and deviance. This approach allows for studying individual-level patterns of drunk driving over time to offer insights about both between and within individual patterns of the propensity to drive drunk. Many criminologists embrace a criminal career framework that models the temporal pattern of criminal and delinquent behaviors committed by individuals (see Blumstein, Cohen, Roth, and Visher, 1986). This theoretical approach is well accepted by criminologists and relies on the empirical finding that past criminal behavior is a powerful indicator of future criminality—i.e., "the autocorrelation of criminal behavior" (Nagin and Land, 1993: 329). Where the controversy exists is whether there are distinctive criminal and noncriminal groups and how to measure criminal onset and termination (i.e., desistance).

Most criminologists are familiar with the debate between propensity theorists (such as Gottfredson and Hirschi, 1990) and criminal career proponents (Blumstein et al., 1986; see Nagin and Land, 1993; Osgood and Rowe, 1994). Discussing this debate is well beyond this essay; instead, the intention is to call attention to the use of theory and method to identify the longitudinal pattern of criminal activity within individuals to understand and provide policy direction about DUI recidivism. When do people start drinking and driving? What is the frequency of drunk driving? What causes interruptions in their patterns of drunk driving? Exploring these sorts of research questions will provide perspective about the patterning of drunk-driving behavior that is needed to advance policy.

Drunk driving has many similar features to other forms of norm violation that criminological theories and methods are ideally suited to explore. Simply, drunk driving is a crime that individuals engage in at varying rates and degrees, and there is the potential for detrimental consequences. However, little is known about the relationship between DUI and common criminological explanatory variables—e.g., age, marital status, race, peer associations, and financial strains. Take the age–crime curve relationship that is well founded in criminology that shows peak offending periods in late adolescence and the early 20s that drop to nearly zero by the 30s. But, does this hold true for drunk driving?

In recent research using a sample of nearly 4,000 offenders convicted of DUI, DeMichele et al. (2013b) found that older, White, and single offenders had the

highest rate of DUI arrests. Using a different dataset of nearly 1,000 offenders, DeMichele and Lowe (2012) found that unmarried offenders who also were hard drug users were more likely to be repeat DUI offenders, but age and race had no effects. As many corrections agencies have adopted an evidence-based approach to policy development, policy makers, administrators, and practitioners are looking to the criminological community to provide rigorous research that uncovers the complexity of DUI recidivism. But before criminologists can make serious policy inroads on DUIs, in-depth research on the patterning of this crime must be performed.

Developing longitudinal datasets to study the onset, frequency, and termination of drunk driving has the potential to inform DUI typologies. Typological frameworks are helpful ways to capture within-group similarities and between-group differences. In some ways, typologies provide a cognitive shorthand to make sense of complex phenomenon. Terrie Moffitt (and others) found that many people engage in limited amounts of crime through their adolescent years (i.e., adolescent limited), but there is only a "small group of persons . . . that engage in antisocial behavior of one sort or another at every stage of life" (i.e., life-course persistent) (Moffitt, 1993: 676). Nagin and Land (1993) expanded Moffitt's typology with a group-based trajectory approach that identifies multiple types of offending based on onset, frequency, and termination patterns. Nagin and Land (1993) identified four distinctive groups or trajectories: the never convicted, the adolescence limiteds, the high-level chronics, and the low-level chronics.

Typologies dovetail nicely with the effort to develop actuarial risk assessments. Risk assessments use a series of cutoff scores associated with probabilities of reoffending to place offenders into specific groups or types. Therefore, Nagin and Land (1993) and Nagin (2005) provided a theoretical and methodological framework for researchers to consider when developing risk assessments. DUI patterns may be similar to what Nagin and colleagues have found with other types of crimes, with some offenders (and nonoffenders) drinking and driving but never convicted, others may drink and drive during a risky or criminogenic phase of their life, and others may routinely drink and drive at varying rates for most of their life.

For various reasons, criminological theory is applied infrequently to persistent drunk driving. Dugosh et al. (2013) provide a foundation from which criminologists can integrate various criminological risk factors and theories to strengthen risk-assessment tools for drunk driving. By ensuring that criminological risk factors for drunk driving are integrated into drunk-driving risk-assessment tools, the internal validity of the tools will be strengthened.

It Is Imperative that the Right Tools Are Used to Build Future Tools

A quick trip to a hardware store, particularly one of the large ones, might leave many of us overwhelmed with the number of tools available for purchase. Think for a moment where these tools came from. They did not just magically appear. Instead, tools were used to create those tools. The same can be said for risk-assessment tools: Tools are used to create

drunk-driving risk-assessment tools. To develop the most valid and reliable predictive tools possible, criminologists must use the appropriate statistical tools. Next, we will discuss two strategies that have proved to be valuable in creating drunk-driving risk-assessment tools. The first approach relies on the Poisson distribution to account for the skewed nature of offender datasets, and the second approach is rather different using algorithmic methods.

A Tool to Account for Overdispersion: Poisson Distribution

Criminal offense data pose challenges to quantitative researchers that often results in violations to linear regression assumptions. Many offender datasets are skewed because of the low frequency of rearrest and delinquency, which causes overdispersion (i.e., the Var $>\bar{x}$). Lattimore et al. (2004), Osgood (2000), and others have shown that failing to consider the overdispersed nature of offender datasets can lead to incorrect point estimates and deflated standard errors. Of course, one can always categorize the dependent variable and estimate logit or similar techniques appropriate for truncated datasets, but reducing the counts to categories may eliminate potentially important variation to be explained (Gardner, Lidz, Mulvey, and Shaw, 1996).

DeMichele et al. (2013a) used a dataset of nearly 3,404 drunk drivers and found overdispersion to be a problem. Figure 1 shows overdispersion with prior drunk-driving arrests that are skewed toward the left as nearly half of the sample has no previous DUI arrests (other than the current offense). They (DeMichele et al., 2013a) used a generalization of the Poisson model to estimate the relationship between counts of prior arrests. They did not find support for a series of substance abuse, mental and emotional health, and employment and income variables, but they did find support for prior incarceration, prior probation, and juvenile arrest. They also found that the Poisson distribution underpredicts zeros (i.e., lack of multiple DUI arrests) and overpredicts the rate for individuals to have 1 or 2 prior arrests, and it suggests the same probability for zero and 1 prior arrest. These facts and a series of diagnostics are why the negative binomial regression was used.

We will provide a brief, nontechnical description of the Poisson distribution and the negative binomial regression model. The Poisson distribution approximates the binomial distribution that often is referred to as the law of rare events. Equation 1 is the general Poisson distribution:

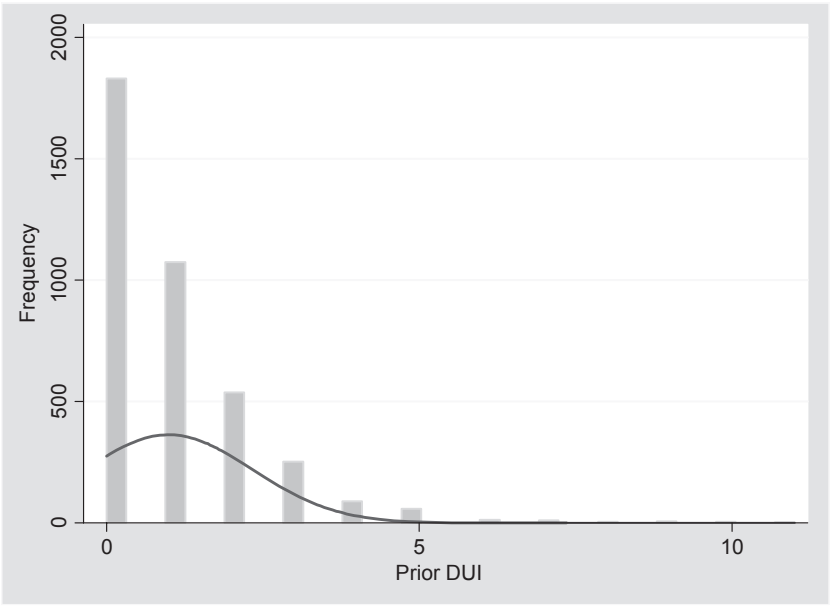
$$\Pr(y|\mu) = e^{-\mu}\mu^{y}/y! \quad \text{for } y = 0, 1, 2 \ldots \tag{1}$$

In this equation, μ is the expected number of DUI arrests a person has experienced and y is a random variable indicating the actual number of prior DUI arrests observed within the sample.[2] The Poisson distribution explains the relationship between the expected count μ and the true probability of prior DUIs observed within the sample y, and μ is the sole

2. The discussion about Poisson models relies on several sources but mostly pulls from Long and Freese's (2006: ch. 8) discussion. Those interested in a thorough treatment of Poisson models and count data

FIGURE 1

Histogram and Normal Curve for Number of Prior DUI Convictions Adapted from DeMichele et al. (2013a).



parameter defining the distribution (Cameron and Trivedi, 1998; Long and Freese, 2006: ch. 8). This brings up an interesting issue with the Poisson distribution because μ is the mean and the variance, which is known as equidispersion. The equidispersion assumption makes fitting Poisson models using real data difficult, especially with indicators of criminal events and crime rates (Lattimore et al., 2004; Nagin and Land, 1993; Osgood, 2000). For this reason, the negative binomial regression model—which relies on the Poisson distribution—is recommended for criminologists, and it is easy to implement with common statistical software.

The Poisson regression model allows for estimating observed heterogeneity across observations (Long and Freese, 2006). Such heterogeneity can be captured because this model "assumes that the observed count for observation i is drawn from a Poisson distribution with mean μ_i" that is estimated by observed sample characteristics (Long and Freese, 2006: 356). Another advantage of the negative binomial model is the inclusion of a parameter

also are referred to Cameron and Trivedi (1998). We follow Long and Freese's (2006) and Land's (1992) equation symbol of the estimated rate of a count μ as opposed to the symbol used in recent criminological texts, λ (see Lattimore et al., 2004; Nagin and Land, 1993; Osgood, 2000). The equations are identical other than the difference in symbols.

to capture unobservables. Equation 2a is the negative binomial regression model, and 2b demonstrates the estimation of error as δ_i.

$$\tilde{\mu}_i = \exp(\beta_0 + \beta_1 x_{i1} + \beta_k x_{ik} \ldots) \exp(\varepsilon_i) \tag{2a}$$

$$\exp(\varepsilon_i) = \delta_i \tag{2b}$$

Equation 2b shows that the negative binomial regression model includes an individual-level error term to capture unobserved unit-level heterogeneity (Nagin and Land, 1993).

The point here is to call attention to the nature of many offender datasets that may pose potential violations to normality. If criminologists are going to provide policy direction, then we must rely on rigorous methodological standards to estimate closely real relationships between key independent variables and outcomes of interest. Criminologists have been slow to study drunk driving; yet criminal justice practitioners make decisions about large caseloads of DUI offenders. And, to date, much of this practice is unstructured by criminological direction.

Predicting Real Problems with a "Real" Tool: Algorithmic Tools

Algorithmic methods were designed to provide practical advice about specific real-world issues (Berk, 2011). Algorithmic methods were popularized by Leo Breiman and others (Breiman, Friedman, Stone, and Olshon, 1984) to make predictions using large complex data sets. Breiman (2001: 199) argued that "if our goal . . . is to use data to solve problems, then we need to . . . adopt a more diverse set of tools." Algorithmic analyses allow for grouping individuals based on initial conditions that are defined as risk or protective factors that are relatively unique to that subgroup (homogeneous within subgroup but differ between subgroups).

The outputs are a series of decision trees that split the data into smaller unique samples based on the outcome and the previous tree split. The algorithm repeatedly splits the data "into the purest" high-risk and low-risk subgroups with respect to a specific outcome of interest" (Dierker, Rose, Tan, and Li, 2010: 339). Decision tree analysis offers a further benefit of classifying cases according to the outcome variable and not as a linear relationship, but rather it allows analysts to consider multiple pathways to risk. Therefore, we may find that cases have similar outcomes—meaning they failed on probation during a given period of time—but they had different paths or risk factors that lead them to that outcome.

DeMichele and Lowe (2012) used a type of algorithmic method, classification and regression tree analysis (CART), with a sample of 935 offenders on probation for a DUI. They used CART to classify offenders according to receipt of any one of four types of negative outcomes over a 6-month period: missed appointment, failed drug test, revocation, and new arrest. The failure rate was slightly higher than 25% ($n = 258$), and 41 predictor variables were used in the CART analysis to identify potential pathways related to failure.

The analysis included 938 offenders on probation for a DUI in which 27.5% failed; we wanted to understand how marital status was associated with failure, and nearly 85% ($n =$ 219) of all failures were unmarried and only 15% of failures were married ($n = 39$). Next, the algorithm relies on a series of chi-squared tests to partition the data according to failures. The use of hard drugs was the next characteristic used to partition the data; approximately half of the offenders who admitted to using hard drugs and who were unmarried experienced a failure, with only 22% of the non–hard-drug users who were unmarried experiencing a failure.

The intentions here are not to describe this research in full but to point to the application of different quantitative methods to discern important patterns of failures among DUI probationers. John Monahan et al. (2001) provided a thorough discussion of how CART models can be incorporated with forward stepwise logistic regression techniques to produce a series of trees.

Some may dismiss these statistical tools because they may seem difficult to understand. Two points counter this suggestion. First, policy makers and decision makers typically have more awareness about these tools than we give them credit for. Second, even if one does not know how to use one of these statistical tools, that does not mean that the same person cannot use a risk-assessment tool derived from complicated statistical techniques. Similarly, we do not need to know how to make a screwdriver in order to use a screwdriver. But it is imperative to know how the predictive tool was made, why it was made, and how to use it.

Predictive Tools Must Come with Warning Labels

The final tool theme we will consider is perhaps the most basic: Tools must come with warning labels. One electric drill reportedly has a warning label that says, "This product not intended for use as a dental drill." This warning may seem to be unnecessary. However, substance abuse screening tools have been used routinely to predict drunk driving perhaps because no warning label discouraged their use in such situations. Although this may be a glib point to make, the simple fact is that criminal justice professionals must be provided the appropriate predictive tools that can be used to assess persistent drunk driving. Criminologists should play a lead effort in developing these tools and in ensuring that professionals are appropriately trained on how to use the tools.

Concluding Remarks

Criminology, to paraphrase Sutherland's well-known definition, is the study of the causes, consequences, and control of crime. In addition, DUI recidivism is an area in which criminologists can contribute theoretically rich and methodologically robust research that shapes policy development. It seems that DUI is an area that has not only received little criminological attention but also, in some ways, less than serious attention. It is as if drunk driving is not viewed as a "real" crime, but it is treated as a soft form of criminality. National

statistics show that nearly as many people are killed in alcohol-related crashes as are killed by homicides; yet criminologists tend to ignore DUI offending.

A central purpose for studying DUI offending is to shape policy and practice.[3] DUI offenders make up approximately 15% of the four million adults on probation, and probation officers and administrators are looking for direction with how to supervise these individuals. However, criminological research tends to focus on street crimes and more overt forms of predation. In some ways, this makes sense because policy makers and the public are most concerned with predatory crimes. However, it does seem strange that criminologists investigating DUI offending would not rely on advanced methodological tools and criminological theories. After all, what sets criminology apart from other academic disciplines studying human behavior is the development of specific methods and theories to measure and explain the complex interplay of structural forces and psychological characteristics that are related to the likelihood of various types of deviant, delinquent, and criminal behaviors. Moreover, criminological research can be useful in developing actuarial risk-assessment instruments.

Actuarial risk-assessment instruments improve outcomes over clinical judgment alone (Meehl, 1954), but agencies have little guidance in predicting risk for DUI offenders specifically. Instead, many agencies rely on general risk-assessment instruments that, although they may predict general recidivism well, have relatively low predictive validity with DUI offenders. DeMichele and Payne (2012) used a sample of roughly 3,800 DUI offenders to determine how the 54 Level of Service Inventory-Revised items predicted prior DUI arrests, and they found that only 6 of these items were significant predictors. Risk-assessment development has gone through several changes since Burgess (1928) developed an unweighted instrument of binary items to estimate parole failure (Gottfredson and Moriarty, 2006). Dugosh et al. (2013) and others are working to identify the combination(s) of characteristics that increase the likelihood of someone having multiple DUIs.

Predicting DUI recidivism is a data problem with real-world policy implications. Such predictions have implications for criminal justice budgets, officer time, and offender outcomes. The selection of any methodological approach must be led by the research question(s) and goal(s). Although algorithmic methods are not used widely by criminologists, these methods have been used recently to study offender homicide recidivism (Neuilly, Zgoba, Tita, and Lee, 2011), DUI arrests (DeMichele and Lowe, 2012), inmate misconduct (Berk, Kreigler, and Baek, 2003), sex offending (Parent, Guay, and Knight, 2012), violent arrests among discharged psychiatric patients (Monahan et al., 2001), and violence and recidivism (Rosenfeld and Lewis, 2005; Silver and Chow-Martin, 2001; Stalans, Yarnold, Seng, Olson, and Repp, 2004). Certainly they also can be applied to understand more fully the predictors of repeat drunk driving.

3. This policy agenda does not rule out contributions to theory and methods for as administrators embrace evidence-based practices, criminologists can refine theoretical arguments and identify and develop robust methods.

Dugosh et al. (2013) address an important issue by trying to use research to contribute to risk-assessment development. Placing these predictive tools within the policy framework requires that such tools are developed with statistical rigor, based on established theories, used with caution, viewed as just one tool in a broader toolkit, and evaluated over time. Perhaps most importantly, such predictive tools should not be used to promote punishment but should be used to guide treatment and supervision strategies. If we want to "hammer" offenders, then we should not use predictive tools to do so. If we want to hammer something, then tools designed to "hammer" should be used.

References

Berk, Richard A. 2011. *An Introduction to Ensemble Methods for Data Analysis*. Unpublished Department of Statistics Papers, Department of Statistics, University of California at Los Angeles. Retrieved from escholarship.org/uc/item/54d6g9gf.

Berk, Richard A., Brian Kreigler, and Jong-Ho Baek. 2003. Forecasting dangerous inmate misconduct: An application of ensemble statistical procedures. *Journal of Quantitative Criminology*, 22: 131–145.

Blumstein, Alfred, Jacqueline Cohen, Jeffrey A. Roth, and Christy A. Visher (eds.). 1986. *Criminal Careers and "Career Criminals," Vol. 1*. Washington, DC: National Academies Press.

Breiman, Leo. 2001. Statistical modeling: The two cultures. *Statistical Science*, 16: 199–215.

Breiman, Leo, Jerome Freidman, Charles J. Stone, and R. A. Olshon. 1984. *Classification and Regression Trees*. Boca Raton, FL: Chapman & Hall/CRC Press.

Burgess, Ernest. 1928. Factors determining success or failure on parole. In (Andrew A. Bruce, Albert James Harno, Ernest Burgess, and John Landesco, eds.), *The Working of the Indeterminate Sentence Law and the Parole System in Illinois*. Springfield, IL: State Board of Parole.

Cameron, A. Colin and Pravin K. Trivedi. 1998. *Regression Analysis of Count Data*. Cambridge, U.K.: Cambridge University Press.

DeMichele, Matthew and Nathan C. Lowe. 2011. Predicting DWI recidivism: A risk assessment tool for community corrections. *Federal Probation*, 75: 19.

DeMichele, Matthew and Nathan C. Lowe. 2012. *Identifying Multiple Pathways to Probation Failure: Using a Multiple Models Classification Tree Approach*. Presented at the annual meeting of the American Society of Criminology, Chicago, IL.

DeMichele, Matthew, Nathan C. Lowe, and Brian K. Payne. 2013a. A criminological approach to explain chronic drunk driving. *American Journal of Criminal Justice*. In press.

DeMichele, Matthew, Nathan C. Lowe, and Brian K. Payne. 2013b. Identifying the characteristics of chronic drunk drivers using a criminological lens. *Crime & Delinquency*. In press.

DeMichele, Matthew and Brian K. Payne. 2012. *Predicting Repeat DWI: Chronic Offending, Risk Assessment, and Community Supervision*. Lexington, KY: American Probation

and Parole Association. Retrieved July 15, 2013 from ncjrs.gov/App/Publications/Abstract.aspx?id=260552.

Dierker, Lisa, Jennifer Rose, Xianming Tan, and Runze Li. 2010. Uncovering multiple pathways to substance use: A comparison of methods for identifying population subgroups. *Journal of Primary Prevention*, 31: 333–348.

Dugosh, Karen L., David S. Festinger, and Douglas B. Marlowe. 2013. Moving beyond BAC in DUI: Identifying who is at risk of recidivating. *Criminology & Public Policy*, 12: 181–193.

Gardner, William, Charles W. Lidz, Edward P. Mulvey, and Esther C. Shaw. 1996. Clinical versus actuarial predictions of violence in patients with mental illness. *Journal of Consulting Human Behavior*, 20: 35–48.

Gottfredson, Michael R. and Travis Hirschi. 1990. *A General Theory of Crime*. Stanford, CA: Stanford University Press.

Gottfredson, Stephen D. and Laura J. Moriarty. 2006. Statistical risk assessment: Old problems and new applications. *Crime & Delinquency*, 52: 178–200.

Land, Kenneth C. 1992. Models of criminal careers: Some suggestions for moving beyond the current debate. *Criminology*, 30: 149–155.

Lattimore, Pamela K., John M. MacDonald, Alex R. Piquero, Richard L. Linster, and Christy A. Visher. 2004. Studying the characteristics of arrest frequency among paroled youthful offenders. *Journal of Research in Crime and Delinquency*, 41: 37–57.

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

Meehl, Paul E. 1954. *Clinical Versus Statistical Prediction*. Minneapolis: University of Minnesota Press.

Moffit, Terrie E. 1993. Adolescence-limited and life-course-persistent antisocial behavior: A developmental taxonomy. *Psychological Review*, 100: 674–701.

Monahan, John, Henry J. Steadman, Eric Silver, Paul S. Appelbaum, Pamela Clark Robbins, Edward P. Mulvey, et al. 2001. *Rethinking Risk Assessment: The MacArthur Study of Mental Disorder and Violence*. New York: Oxford University Press.

Nagin, Daniel S. 2005. *Group-Based Modeling of Development*. Cambridge, MA: Harvard University Press.

Nagin, Daniel S. and Kenneth C. Land. 1993. Age, criminal careers, and population heterogeneity: Specification and estimation of a nonparametric, mixed Poisson model. *Criminology*, 31: 327–362.

Neuilly, Melanie-Angela, Kristen M. Zgoba, George E. Tita, and Stephen S. Lee. 2011. Predicting recidivism in homicide offenders using classification tree analysis. *Homicide Studies*, 15: 154–176.

Osgood, D. Wayne. 2000. Poisson-based regression analysis of aggregate crime rates. *Journal of Quantitative Criminology*, 16: 21–43.

Osgood, D. Wayne and David C. Rowe. 1994. Bridging criminal careers, theory, and policy through latent variable models of individual offending. *Criminology*, 32: 517–554.

Parent, Geneviève, Jean-Pierre Guay, and Raymond A. Knight. 2012. Can we do better? The assessment of risk of recidivism by adult sex offenders. *Criminal Justice and Behavior*, 39: 1647–1667.

Rosenfeld, Barry and Charles Lewis. 2005. Assessing violence risk in stalking cases: A regression tree approach. *Law and Human Behavior*, 29: 343–349.

Seeger, Pete and Lee Hays. 1949a. If I had a hammer [Recorded by Peter, Paul and Mary]. *On Peter, Paul and Mary* [Vinyl]. New York: Warner Bros. (1962).

Seeger, Pete and Lee Hays. 1949b. The hammer song [Recorded by The Weavers]. Single [78]. New York: Hootenanny Records. (1950).

Silver, Eric and Lynette Chow-Martin. 2001. A multiple models approach to assessing recidivism risk: Implications for judicial decision making. *Criminal Justice and Behavior*, 29: 538–568.

Stalans, Loretta J., Paul R. Yarnold, Magnus Seng, David E. Olson, and Michelle Repp. 2004. Identifying three types of violent offenders and predicting violent recidivism while on probation: A classification tree analysis. *Law and Human Behavior*, 28: 253–271.

Matthew DeMichele is a research social scientist at RTI-International. He has published widely on correction and community corrections issues. His research has appeared in journals such as *Aggression and Violent Behavior, Crime & Delinquency, European Journal of Crime, Criminal Law*, and *Criminal Justice*.

Brian Payne is Vice Provost for Graduate and Undergraduate Programs and professor of sociology and criminal justice at Old Dominion University. He is the vice president of the Academy of Criminal Justice Sciences and a past president of the Southern Criminal Justice Association. He has published seven books and numerous journal articles in outlets such as *Justice Quarterly*, *Crime and Delinquency*, and *Aggression and Violent Behavior*.

EDITORIAL INTRODUCTION

LOCAL IMMIGRATION ENFORCEMENT

287(g)

State and Local Enforcement of Immigration Law

Scott Akins
Oregon State University

More immigrants arrive in America than in any other country in the world. Although immigration is an essential part of the American story, to some the recent and nearly unprecedented immigration flow spells societal ruin and to others it portends societal renewal (MacDonald and Sampson, 2012). Of course, a massive wave of immigrants arriving in America is nothing new, and it is only the primary countries of origin that have changed. In the years surrounding the turn of the 20th century, just less than 15% of the population of the United States was foreign born, a figure approximating that of today (Gibson and Lennon, 1999). Then, as now, much political rhetoric has connected recent immigrants, whatever their country of origin, to a variety of social ills, implying or overtly stating that such problems would not exist if not for the immigrants. The theme, consistently, is that immigrants undermine the social fabric of America, instilling a fear of "what the 'foreign element' can do to America" (Portes and Rumbaut, 2006: 118). Prominent in such rhetoric is that recent immigrants pose a greater risk of criminal offending than do the native born. A belief in the "criminal immigrant" is most widely held by the native born, especially those with an inflated view of the relative size of the immigrant population (Wang, 2012). Fueling these beliefs, politicians have at times been guilty of flatly misrepresenting evidence on the extent of immigration and on the proportion of crime committed by newly arrived immigrants (Casey, 2006; Hagan and Phillips, 2008; Sampson, 2008), which in turn exerts considerable influence on public policy related to immigration regulation (Chávez, 2001; Hagan and Palloni, 1999; Lee, 2003; Martinez and Valenzuela, 2006; Massey and Pren, 2012; Rumbaut, 2009).

The facts are that that since the early 1990s, as the immigrant population (especially the undocumented population) increased sharply to historic highs,[1] the rates of violent and

Direct correspondence to Scott Akins, Department of Sociology, Oregon State University, 307 Fairbanks Hall, Corvallis, OR 97331-3703 (e-mail: sakins@oregonstate.edu).

1. In terms of raw numbers, immigration is at a historic high. As a percentage of the total population, current figures approximate but may be slightly below the figures reported for the decades surrounding the turn of the 20th century.

DOI:10.1111/1745-9133.12042

property crimes in the United States decreased significantly, in some instances to historic lows—as measured both by crimes reported to the police and by national victimization surveys (U.S. Bureau of Justice Statistics, 2012; see also Sampson, 2008). Moreover, for every ethnic group, without exception, incarceration rates among young men are lowest for recent immigrants, even those who are the least educated (Rumbaut, 2005, 2009; see also Kelsey, 1926). Finally, although this broad literature is nuanced, most multivariate studies on the topic find no evidence that recent immigration is positively associated with crime net of controls.[2] In fact, the reverse seems more likely to be true.

Regardless of these findings, the federal government grew increasingly assertive in pursuing illegal immigrants beginning roughly two decades ago. Although the enforcement of federal immigration law has traditionally been the charge of the federal government, federal law is vague about what role, if any, state and local law enforcement may play in immigration enforcement (for a review, see Appleseed, 2008). But faced with the task of locating, detaining, and deporting a large and growing population of undocumented immigrants, the fed launched a variety of programs designed to enlist the aid of state and local law enforcement agencies. The most well known of these programs is the 287(g) program, referring to Section 287(g) of the Immigration and Naturalization Act (1952). Enacted in 1996, 287(g) authorizes federal authorities to enter into formal agreements (Memorandums of Understanding) with state and local law enforcement agencies regarding their participation in illegal immigration enforcement.[3] Enforcement programs implemented under 287(g) consist of three primary models: (a) the "jail model," adopted by the majority of 287(g) participants, involves screening individuals for immigration violations upon booking; (b) the "task force model," in which officers may screen for immigration status, and detain, when contacting individuals in the field; and (c) the "hybrid model" that involves both of

2. Recent studies include the following: Akins, Rumbaut, and Stansfield (2009); Alaniz, Cartmill, and Parker (1998); Butcher and Piehl (2008); Chavez and Griffiths (2009); Davies and Fagan (2012); Feldmeyer (2009); Feldmeyer and Steffensmeier (2009); Graif and Sampson (2009); Hagan and Palloni (1998, 1999); Kubrin and Ishizawa (2012); Lee, Martinez, and Rosenfeld (2001); Lyons, Velez, and Santoro (2013); Martinez (2002, 2006); Martinez and Lee (1998); Martinez, Rosenfeld, and Mares (2008); Martinez, Stowell, and Cancino (2008); Martinez, Stowell, and Lee (2010); Nielsen, Lee, and Martinez (2005); Nielsen and Martinez (2009); Ousey and Kubrin (2009); Polczynski, Laurikkala, Huff-Corzine, and Corzine (2009); Reid, Weiss, Adelman, and Jaret (2005); Rumbaut (2009); Sampson (2008); Sampson, Morenoff, and Raudenbush (2005); Shihadeh and Barranco (2010); Shihadeh and Winters (2010); Stansfield (2013); Stansfield, Akins, Rumbaut, and Hammer (in press); Stowell and Martinez (2009); Stowell, Messner, McGeever, and Raffalovich (2009); Velez (2009); Wadsworth (2010); for historical context, see Cohen (1931); Kelsey (1926).

3. It is important to note that independent of federal involvement, many states and localities have adopted policies requiring or allowing local authorities to take action in cases involving illegal immigrants—so 287(g) programs represent only one, albeit a primary, example of local immigration enforcement. A related program is "Secure Communities" through which Immigration and Customs Enforcement (ICE) uses federal databases to screen the legal status and previous immigration violations of inmates in state prisons and local jails. Participating jurisdictions automatically forward detainee prints to ICE, and ICE officials notify state and local officials if the individual is subject to removal.

these processes (see Capps, Rosenblum, Rodriguez, and Chishti [2011] for a summary). Importantly, regardless of the model, some jurisdictions pursue immigration violations only when the individual has committed crimes that U.S. Immigration and Customs Enforcement (ICE) considers to be serious (the "targeted" approach), whereas other programs are "universal," pursuing immigration violations regardless of the reason for contact (e.g., traffic stops). The populations targeted by 287(g) programs vary tremendously by jurisdiction, even in those jurisdictions that claim to focus exclusively on serious offenders. Research has indicated that roughly half of those detained by ICE via 287(g) are so-called "serious offenders"—those committing ICE-designated Level 1 and Level 2 offenses—but captured within this designation are misdemeanor drug and property crimes as well as forms of traffic offenses. Some agencies and jurisdictions issue more than three quarters of their 287(g) detainers for individuals whose most serious violation was either a (least-serious) Level 3 offense or a traffic violation; for the county under investigation by Koper, Guterbock, Woods, Taylor, and Carter (2013, this issue), this figure was 60% with just less than half of all detainers issued in response to traffic violations (Capps et al., 2011). Similar to cost–benefit analyses of selective incapacitation policies, the specifics of particular 287(g) programs are not trivial but are essential to consider for those attempting to evaluate a program's potential merit and risk—"how wide the net is thrown" has major implications in terms of cost and latent consequences.

Koper et al. (2013) provide a much needed examination of the effect of 287(g) on serious crime in Prince William County (PWC), Virginia, a suburb of Washington, D.C. PWC experienced a 66% growth in its foreign-born population from 1990 to 2006 and shortly thereafter implemented a 287(g) enforcement strategy, which was highly publicized in the community because of its controversial nature. These circumstances provided Koper et al. with an excellent quasi-experimental opportunity to consider how PWC's adoption of 287(g) in 2008 affected serious crime patterns in the county. Comparing crime patterns in PWC before and after the adoption of 287(g), and comparing crime patterns with crime trends in nine neighboring communities as a control, Koper et al. conclude that the adoption of 287(g) had no effect on crime aside from an apparent decrease in aggravated assaults that emerged primarily between July and December 2007, a period coinciding with the announcement and pending implementation of the program. Violence also declined in some of the study comparison communities over the time under investigation, but Koper et al. find the decline in aggravated assault in PWC during their period of study to be "greater than that experienced by any other large county or city in northern Virginia or suburban Maryland, including those doing varying levels of immigration enforcement." Koper et al. are appropriately cautious in interpreting their finding of an apparent association of 287(g) with reduced assault, noting that reduced offending, reduced victimization, and reduced crime reporting among illegal immigrants are all potential explanations for this finding.

In his policy essay, Matthew T. Lee (2013, this issue) questions why the residents of PWC feared "rising street crime" during a period in which crime in the county had been

steadily dropping, and why policy makers targeted immigrants for additional law enforcement in the first place. He suggests that much of what prompted the adoption of 287(g) in PWC were noncriminal, nuisance issues such as signs of overcrowding and unkempt lawns. Further questioning the wisdom of using local immigration enforcement programs such as 287(g), Lee points to extensive research that has indicated that recent immigrants are no more likely to be criminal offenders than the native born. Given this finding, Lee questions why one would expect enforcement efforts targeting recent immigrants to yield any crime reduction. Lee comments that public policy would better serve the public good by supporting the social capital that recent immigrants bring to the United States. Drawing on the "immigrant revitalization perspective" and current empirical work by Lyons et al. (2013), Lee suggests that punitive legal intervention in immigration issues will not only fail to reduce crime but also may undermine the community revitalization and crime preventative effect that recent immigration can provide.

In the final policy essay, Coonan (2013, this issue) builds on the sentiments expressed by Lee noting that 287(g) is "a solution in search of a problem." Providing an overview of the emergence of 287(g) and changes in the program over time, Coonan places much of his focus on the civil rights implications and negative consequences associated with this policy. In particular, Coonan highlights the fact that 287(g) suffers from a lack of truth in advertising—being presented as a public safety measure focused on serious offenders but in practice generating the deportation of individuals who outside of being undocumented commit either no or only minor offenses. Commenting on the empirical work by Koper et al. (2013), Coonan highlights several issues that are important to consider when interpreting their findings. Among these is the fact that only one of several crime measures was associated with the 287(g) policy treatment, and more specifically, it was the *announcement* (italics original) of the impending 287(g) policy, not the implementation of the policy and subsequent removals, that was associated with the apparent effect on aggravated assault. Furthermore, Coonan points out that the undocumented immigrant population in PWC declined significantly in the years after the implementation of 287(g), but no further decrease in crime was evident after the early months of 2008 (see Figure 2 in Koper et al., 2013). Coonan concludes by presenting evidence of the substantial fiscal consequences of 287(g) in PWC and by questioning the wisdom of a program that he views as succeeding in removing the undocumented but failing its stated goal of "removing dangerous criminal aliens from U.S. communities."

Although 287(g) and related local immigration enforcement programs are widespread in the United States, the efficacy of 287(g) enforcement as a crime-reduction strategy has been subject to almost no empirical inquiry. Koper et al. (2013) should be commended for providing a well-designed quasi-experimental study that facilitates discussion of this topic. The existing research on the relationship of recent immigration and crime, both historical and current, has strongly suggested that recent immigrants are at no greater risk of offending than the native born and that this population may even provide a crime-protective

function. Therefore, if any crime preventative effect were to be generated by 287(g) or an analogous program, then it would most likely be the result of a program that is jail based and targeted exclusively at felony offenders, *not* at the general immigrant population.[4] Policy makers who remain committed to 287(g) or similar programs should be aware that jail-based, felony-offender only programs would have the benefit of reducing, although not eliminating, the negative outcomes that accompany 287(g) and similar local immigration enforcement efforts. Future research should consider this.

Empirical assessments of 287(g) on variables other than crime reduction indicate that the adoption of this program comes with myriad negative consequences, often placing state and local law enforcement in difficult positions. From the perspective of many police, the adoption of such programs creates additional fiscal and workload burdens and clouds the role of police as protectors of public safety in their local communities (Police Foundation, 2009). Public trust in the police is a precious commodity: hard won, easily lost, and essential to the effective functioning of the police. 287(g), particularly in its more aggressive forms, undermines this trust. All else equal, immigrant communities tend to be more cooperative with police and less cynical of the law (Kirk, Papachristos, Fagan, and Tyler, 2012). This may in part account for the lower rates of crime identified in immigrant communities, and efforts such as 287(g) put this at risk. A related concern is that 287(g) discourages crime reporting, especially in the immigrant community, and thereby it makes immigrants in particular more susceptible to criminal victimization (Police Foundation, 2009; Weisman, Ivey, Headen, and Parker, 2009). Furthermore, if victims or their families do not regard the police as a resource that is available to address violations inflicted on them, then it follows that this could increase cases of vigilantism. Finally, several studies have identified a displacement effect associated with 287(g), with immigrant populations fleeing to neighboring locales (Capps et al., 2011). It has been repeatedly demonstrated that undesirable community conditions prompt the most qualified and able in the community to seek greener pastures, leaving those who remain without the cultural capital and leadership that these individuals provide. This in turn destabilizes the community as a whole, leading to a variety of social ills (Anderson, 1990; Shaw and McKay, 1942, 1969; Wilson, 1987, 1996). As the most educated and least educated groups in the United States are immigrants (Rumbaut, 2008), locales adopting such legislation may be self-imposing a "brain drain." Although the most educated of immigrants are far more likely to be documented, they are also far more likely to have many viable alternatives for their place of residence and may choose places they perceive to be less hostile. Even among the least educated and lower skilled, such policies are likely to cause the selective migration of those with the most options. With respect to immigrant revitalization, political opportunity and proimmigrant public policy have been found to enhance the crime-protective effect of immigration (Lyons et al., 2013). If it is

4. As of this writing, 287(g) is being scaled back with greater emphasis being placed on the "Secure Communities" program, described in footnote 3.

indeed the most qualified and able that either flee or select an alternative location to reside in in response to programs like 287(g), then for this and the reasons mentioned, it is likely that such programs undermine public safety.

References

Akins, Scott, Rubén G. Rumbaut, and Richard Stansfield. 2009. Immigration, economic disadvantage and homicide: An analysis of communities in Austin, Texas. *Homicide Studies*, 13: 307–314.

Alaniz, Maria L., Randi S. Cartmill, and Robert N. Parker. 1998. Immigrants and violence: The importance of neighborhood context. *Hispanic Journal of Behavioral Sciences*, 20: 155–174.

Anderson, Elijah. 1990. *Streetwise*. Chicago, IL: University of Chicago Press.

Appleseed. 2008. *Forcing Our Blues into Gray Areas: Local Police and Federal Immigration Enforcement*. Washington, DC: WilmerHale.

Butcher, Kristin F. and Ann M. Piehl. 2008. Crime, corrections and California: What does immigration have to do with it? *Public Policy Institute of California*, 9: 1–24.

Capps, Randy, Marc Rosenblum, Cristina Rodriguez, and Muzzaffar Chishti. 2011. *Delegation and Divergence: A Study of 287(g) State and Local Immigration Enforcement*. Washington, DC: Migration Policy Institute.

Casey, Rick. 2006. Poe pushes panic button. *Houston Chronicle*, September 27, section B, 1.

Chavez, Jorge and Elizabeth Griffiths. 2009. Neighborhood dynamics of urban violence: Understanding the immigration connection. *Homicide Studies*, 13: 261–273.

Chávez, Leo. 2001. *Covering Immigration: Popular Images and the Politics of the Nation*. Berkeley: University of California Press.

Cohen, Joseph. 1931. Report on crime and the foreign born. *Michigan Law Review*, 30: 99–104.

Coonan, Terry. 2013. When perception is reality: 287(g)—A solution in search of a problem. *Criminology & Public Policy*, 12: 283–294.

Davies, Garth and Jeffrey Fagan. 2012. Crime and enforcement in immigrant neighborhoods: Evidence from New York City. *The ANNALS of the American Academy of Political and Social Sciences*, 641: 99–124.

Feldmeyer, Ben. 2009. Immigration and violence: Outlasting effects of immigrant concentration on Latino violence. *Social Science Research*, 38: 717–731.

Feldmeyer, Ben and Darrell Steffensmeier. 2009. Immigration effects on homicide offending for total and race/ethnicity disaggregated populations (White, Black and Latino). *Homicide Studies*, 13: 221–226.

Gibson, Campbell and Emily Lennon. 1999. *Historical Census Statistics on the Foreign-Born Population of the United States: 1950–1990*. Working Paper 29. Washington, DC: Census Bureau, Population Division. Retrieved September 15, 2013 from census.gov/population/www/documentation/twps0029/tab01.html.

Graif, Corina and Robert J. Sampson. 2009. Spatial heterogeneity in the effects of immigration and diversity on neighborhood homicide rates. *Homicide Studies*, 13: 242–260.

Hagan, John and Alberto Palloni. 1998. Immigration and crime in the United States. In (James P. Smith and Barry Edmonston, eds.), *The Immigration Debate*. Washington, DC: National Academy Press.

Hagan, John and Alberto Palloni. 1999. Sociological criminology and the mythology of Hispanic immigration and crime. *Social Problems*, 46: 617–632.

Hagan, John and Scott Phillips. 2008. Border blunders: The unanticipated human and economic costs of the U.S. approach to immigration control, 1986–2007. *Criminology & Public Policy*, 7: 83–94.

Kelsey, Carl. 1926. Immigration and crime. *The ANNALS of the American Academy of Political and Social Science*, 125: 165–174.

Kirk, David, S., Andrew V. Papachristos, Jeffrey Fagan, and Tom R. Tyler. 2012. The paradox of law enforcement in immigrant communities: Does tough immigration enforcement undermine public safety? *The ANNALS of the American Academy of Political and Social Science*, 614: 79–98.

Koper, Christopher S., Thomas M. Guterbock, Daniel J. Woods, Bruce Taylor, and Timothy J. Carter. 2013. The effects of local immigration enforcement on crime and disorder: A case study of Prince William County, Virginia. *Criminology & Public Policy*, 12: 239–276.

Kubrin, Charis and Hiromi Ishizawa. 2012. Why some immigrant neighborhoods are safer than others: Findings from Los Angeles and Chicago. *The ANNALS of the American Academy of Political and Social Science*, 641: 148–173.

Lee, Matthew T. 2003. *Crime on the Border: Immigration and Homicide in Urban Communities*. New York: LFB Scholarly.

Lee, Matthew T. 2013. The need for social policies that support the revitalizing effects of immigration rather than law enforcement initiatives that assume disproportionate immigrant criminality. *Criminology & Public Policy*, 12: 277–282.

Lee, Matthew T., Ramiro Martinez, Jr., and Richard Rosenfeld. 2001. Does immigration increase homicide rates? Negative evidence from three border cities. *The Sociological Quarterly*, 42: 559–580.

Lyons, Christopher, Maria Velez, and Wayne Santoro. 2013. Neighborhood immigration, violence, and city-level immigrant political opportunities. *American Sociological Review*, 78: 604–632.

MacDonald, John and Robert J. Sampson. 2012. The world in a city: Immigration and America's changing social fabric. *The ANNALS of the American Academy of Political and Social Science*, 614: 6–15.

Martinez, Ramiro, Jr. 2002. *Latino Homicide: Immigration, Violence, and Community*. New York: Routledge.

Martinez, Ramiro, Jr. 2006. Coming to America: The impact of new immigration on crime. In (Ramiro Martinez, Jr. and Abel Valenzuela, Jr., eds.), *Immigration and Crime: Race, Ethnicity and Violence*. New York: New York University Press.

Martinez, Ramiro, Jr. and Mathew T. Lee. 1998. Immigration and the ethnic distribution of homicide. *Homicide Studies*, 2: 291–304.

Martinez, Ramiro, Jr., Richard Rosenfeld, and Dennis Mares. 2008. Social disorganization, drug market activity, and neighborhood violent crime. *Urban Affairs Review*, 43: 846–874.

Martinez, Ramiro, Jr., Jacob I. Stowell, and Jeffrey M. Cancino. 2008. A tale of two border cities: Community context, ethnicity, and homicide. *Social Science Quarterly*, 89: 1–16.

Martinez, Ramiro, Jr., Jacob I. Stowell, and Matthew T. Lee. 2010. Immigration and crime in an era of transformation: A longitudinal analysis of homicides in San Diego neighborhoods, 1980–2000. *Criminology*, 48: 797–829.

Martinez, Ramiro, Jr. and Abel Valenzuela, Jr. 2006. *Immigration and Crime: Race, Ethnicity, and Violence*. New York: New York University Press.

Massey, Douglas S. and Karen A. Pren. 2012. Unintended consequences of U.S. immigration policy: Explaining the post-1965 surge form Latin America. *Population and Development Review*, 38: 1–29.

Nielsen, Amie L., Matthew T. Lee, and Ramiro Martinez, Jr. 2005. Integrating race, place, and motive in social disorganization theory: Lessons from a comparison of black and Latino homicide types in two immigrant destination cities. *Criminology*, 43: 837–865.

Nielsen, Amie L. and Ramiro Martinez, Jr. 2009. The role of immigration for violent deaths. *Homicide Studies*, 13: 274–286.

Ousey, Graham C. and Charis E. Kubrin. 2009. Exploring the connection between immigration and violent crime rates in U.S. cities, 1980–2000. *Social Problems*, 56: 447–473.

Polczynski, Christa, Minna Laurikkala, Lin Huff-Corzine, and Jay Corzine. 2009. Immigration and violent crime: Citizen status and social disorganization. *Homicide Studies*, 13: 227–241.

Police Foundation. 2009. Executive summary. In (Anita Khashu, ed.), *The Role of Local Police: Striking a Balance Between Immigration Enforcement and Civil Liberties*. Washington, DC: Police Foundation.

Portes, Alejandro and Rubén G. Rumbaut. 2006. *Immigrant America: A Portrait*, 3rd Edition. Berkeley: University of California Press.

Reid, Leslie W., Harald E. Weiss, Robert M. Adelman, and Charles Jaret. 2005. The immigration-crime relationship: Evidence across U.S. metropolitan areas. *Social Science Research*, 34: 757–870.

Rumbaut, Rubén G. 2005. Turning points in the transition to adulthood: Determinants of educational attainment, incarceration, and early childbearing among children of immigrants. *Ethnic and Racial Studies*, 28: 1041–1086.

Rumbaut, Rubén G. 2008. The coming of the second generation: Immigration and ethnic mobility in Southern California. *The ANNALS of the American Academy of Political and Social Science*, 620: 196–236.

Rumbaut, Rubén G. 2009. Undocumented immigration and rates of crime and imprisonment: Popular myths and empirical realities. In (Anita Khashu, ed.), *The Role of*

Local Police: Striking a Balance between Immigration Enforcement and Civil Liberties. Washington, DC: Police Foundation.

Sampson, Robert J. 2008. Rethinking crime and immigration. *Contexts*, 7: 28–33.

Sampson, Robert J., Jeffrey Morenoff, and Stephen Raudenbush. 2005. Social anatomy of racial and ethnic disparities in violence. *American Journal of Public Health*, 95: 224–232.

Shaw, Clifford and Henry McKay. 1942. *Juvenile Delinquency and Urban Areas*. Chicago, IL: University of Chicago Press.

Shaw, Clifford and Henry McKay. 1969. *Juvenile Delinquency and Urban Areas*, 2nd Edition. Chicago, IL: University of Chicago Press.

Shihadeh, Edward S. and Raymond E. Barranco. 2010. Latino immigration, economic deprivation, and violence: Regional differences in the effect of linguistic isolation. *Homicide Studies*, 14: 338–356.

Shihadeh, Edward S. and Lisa Winters. 2010. Church, place and crime: Latinos and homicide in new destinations. *Sociological Inquiry*, 80: 628–649.

Stansfield, Richard. 2013. Safer cities: A macro-level analysis of recent immigration, Hispanic-owned businesses, and crime rates in the United States. *Journal of Urban Affairs*. E-pub ahead of print. doi: 10.1111/juaf.12051.

Stansfield, Richard, Scott Akins, Rubén Rumbaut, and Roger Hammer. In press. Assessing the effects of recent immigration on serious property crime in Austin, Texas. *Sociological Perspectives*.

Stowell, Jacob and Ramiro Martinez, Jr. 2009. Incorporating ethnic-specific measures of immigration in the study of lethal violence. *Homicide Studies*, 13: 315–324.

Stowell, Jacob I., Steven F. Messner, Kelly F. McGeever, and Lawrence E. Raffalovich. 2009. Immigration and the recent violent crime drop in the United States: A pooled, cross-sectional time-series analysis of metropolitan areas. *Criminology*, 47: 888–948.

U.S. Bureau of Justice Statistics, Department of Justice. 2012. Criminal victimization, 2011. Retrieved September 15, 2013 from bjs.ojp.usdoj.gov/index.cfm?ty=pbdetail&iid=4494.

Velez, Maria. 2009. Contextualizing the immigration and crime effect: An analysis of homicide in Chicago neighborhoods. *Homicide Studies*, 13: 325–335.

Wadsworth, Tim. 2010. Is immigration responsible for the crime drop? An assessment of the influence of immigration on changes in violent crime between 1990 and 2000. *Social Science Quarterly*, 91: 530–555.

Wang, Xia. 2012. Undocumented immigrants as perceived criminal threat: A test of the minority threat perspective. *Criminology*, 50: 743–776.

Weisman, Deborah M., Reef C. Ivey, Rebecca C. Headen, and Katherine Lewis Parker. 2009. *The Policies and Politics of Local Immigration Enforcement Laws: 287(g) Program in North Carolina*. Chapel Hill: University of North Carolina School of Law.

Wilson, William J. 1987. *The Truly Disadvantaged: The Inner City, the Underclass, and Public Policy*. Chicago, IL: Chicago University Press.

Wilson, William J. 1996. *When Work Disappears: The World of the New Urban Poor*. New York: Random House.

Statute Cited

The Immigration and Nationality Act of 1952, P.L. 82–414, 66 Stat. 163 (1952).

Scott Akins is an associate professor of sociology within the School of Public Policy at Oregon State University. His research interests include drug use and policy and structural criminology, including immigration, acculturation, and deviance, as well as the spatial effects of disadvantage, ethnicity, and crime. His recent work has been published in *Sociological Perspectives, Homicide Studies*, *Journal of Drug Issues,* and *Justice Quarterly.* He is coauthor of *Drugs and Drug Policy: The Control of Consciousness Alteration*.

EXECUTIVE SUMMARY

LOCAL IMMIGRATION ENFORCEMENT

Overview of: "The Effects of Local Immigration Enforcement on Crime and Disorder: A Case Study of Prince William County, Virginia"

Christopher S. Koper
George Mason University

Thomas M. Guterbock
University of Virginia

Daniel J. Woods
Police Executive Research Forum

Bruce Taylor
National Opinion Research Center at the University of Chicago

Timothy J. Carter
James Madison University

Research Summary

This study evaluates a local immigration enforcement policy implemented in Prince William County, Virginia, in 2008. In addition to joining the federal 287(g) program, the County adopted a policy that initially required officers to check the immigration status of people they detained, but the policy was later amended to require immigration checks only for arrestees. Using a pre–post, quasi-experimental design, we examined the policy's impacts on crime reports and calls for service in Prince William County and compared the County's crime trends with those of nearby localities. We also analyzed postpolicy trends in arrests of illegal immigrants, survey reports of crime victimization and reporting among County residents, and survey reports of police views on crime and disorder in the County. Although the policy did not affect most forms of crime in Prince William County (including robberies, property crimes, drug offenses, disorderly behaviors, and drunk driving violations), aggravated assaults declined 27% after the announcement of the original policy in July 2007. However, this initial version of the

DOI:10.1111/1745-9133.12021

policy also seemed to harm police relations with the immigrant community, among other problems.

Policy Implications

As part of the wider debate on illegal immigration in the United States, local police are becoming more heavily involved in immigration enforcement in part as a result of a growing number of state laws and local ordinances directing police to engage in these efforts. The impacts of local immigration enforcement efforts have received very little study to date. Consistent with research on immigration and crime generally, this study suggests that public concern regarding crime by illegal immigrants is perhaps overstated and that expanded local immigration enforcement efforts will have limited impacts on crime. More aggressive immigration enforcement policies may reduce some types of crime, but they also may harm police relations with immigrant communities and impose other costs on local police. Further policy experimentation and research may help local communities to develop balanced approaches that focus on criminal violators and target specific crime problems in immigrant communities without the potentially negative consequences of more widespread crackdowns on illegal immigration.

Keywords

immigration and crime, *immigration enforcement*, *287(g) program*, *community policing*, *policy evaluation*

The Effects of Local Immigration Enforcement on Crime and Disorder

A Case Study of Prince William County, Virginia

Christopher S. Koper
George Mason University

Thomas M. Guterbock
University of Virginia

Daniel J. Woods
Police Executive Research Forum

Bruce Taylor
National Opinion Research Center at the University of Chicago

Timothy J. Carter
James Madison University

The issue of immigration, and particularly illegal immigration, is arguably one of today's most volatile political and public policy issues. The United States has experienced a significant wave of immigration during the last few decades; figures from the U.S. Census show that the percentage of the population that is foreign-born has climbed from approximately 6% in 1980 to approximately 13% in 2009 (Grieco et al., 2012; U.S. Census Bureau, 1999). Along with this influx has come a surge in illegal immigration, particularly from Latin American countries (Passel, 2006).The population of undocumented immigrants in the United States is estimated to have reached nearly 12 million in 2007, before declining to less than 11 million by 2010 (Hoefer, Rytina, and Baker, 2011).

How to address this problem—through enforcement, amnesty, or combined approaches—has been a source of political gridlock at the national level. Consequently, several states and localities have taken their own measures aimed at curbing illegal immigration, in part by increasing the involvement of state and local law enforcement agencies

Direct correspondence to Christopher S. Koper, Center for Evidence-Based Crime Policy, Department of Criminology, Law and Society, George Mason University, 4400 University Drive, MS 6D12, Fairfax, VA 22030 (e-mail: ckoper2@gmu.edu).

DOI:10.1111/1745-9133.12022

in immigration enforcement, an issue for which federal authorities have primary responsibility. Many local law enforcement agencies cooperate with federal immigration authorities through newly created national programs and other arrangements. Moreover, numerous states and localities have enacted or considered laws requiring or allowing local police to take action against illegal immigrants.

Although the immigration issue is complex and multifaceted, crime and public safety often are central to the debate. Yet the impact of immigration enforcement on crime has received almost no empirical study. This article examines a local immigration enforcement policy implemented in Prince William County, Virginia, a suburb of Washington, DC, in 2008. We focus on how the policy impacted crime and disorder in Prince William County and consider the implications of the findings more broadly for legislative policy, police practice, and research on immigration and crime.

Background

Immigration and Crime

Debates over immigration and crime often are fueled by a perception that immigrants contribute substantially to problems of crime and disorder (e.g., see Rumbaut, 2009). This is contrary, however, to much empirical research on the issue. Several contrasting theoretical perspectives on immigration and crime are available, which have been discussed extensively by others (e.g., Hagan and Palloni, 1998; Martinez and Lee, 2000; Ousey and Kubrin, 2009; Sampson, 2008; Shaw and McKay, 1942; Tonry, 1997; Wadsworth, 2010). In short, some perspectives have suggested that immigration may increase crime by (a) contributing to residential instability, ethnic heterogeneity, and the weakening of a community's informal social controls; (b) increasing the share of the population in high-risk demographic groups (immigrants are more likely to be young and male than the general population); and/or (c) aggravating conditions of economic deprivation and competition (resulting from an influx of poor and low-skilled people), which may fuel motivations for participation in crime and illegal markets among both immigrants and nonimmigrants. Others have argued, in contrast, that immigration does not increase crime, and even may reduce it, because immigrants are a selected group with a strong work ethic, lower criminal propensities, and stronger family, cultural, and community ties and values that both insulate them from criminogenic forces and help to promote economic revitalization and noncriminal norms more broadly (including among native residents).

Research on immigration and crime has generally been more consistent with the latter views than the former. To begin with, many studies have found that immigrants are less involved in criminality than the native population (Bui and Thingniramol, 2005; Butcher and Piehl, 1998a, 2007; Hagan and Palloni, 1998; Martinez and Lee, 2000; Rumbaut, 2009; Sampson, Morenoff, and Raudenbush, 2005; Tonry, 1997). Community-level studies have produced more mixed findings, but they generally suggest that immigration reduces or has no discernible effect on crime (see reviews in Ousey and Kubrin, 2009; Wadsworth, 2010).

Most notably, several longitudinal studies have found that growth in immigration over time has reduced crime in studied areas, or at least has not increased it (Akins, Rumbaut, and Stansfield, 2009; Butcher and Piehl, 1998b; Lee, Martinez, and Rosenfeld, 2001; MacDonald, Hipp, and Gill, 2012; Martinez, Stowell, and Lee, 2010; Ousey and Kubrin, 2009; Wadsworth, 2010). Both Wadsworth (2010) and Ousey and Kubrin (2009), for example, found that increasing levels of immigration were associated with reductions in violence in American cities during all or parts of the 1980 to 2000 period. Indeed, as others have noted (e.g., Rumbaut, 2009), the recent surge in legal and illegal immigration in the United States coincided with a period of dramatic reductions in crime as measured through both police statistics and victimization surveys.

These studies have implied that growth in the population of illegal immigrants may not have much impact on crime, insofar as areas with larger numbers of legal immigrants are likely to have larger numbers of illegal immigrants as well. Nonetheless, the relationship between illegal immigration and crime is more unclear. Illegal immigrants could be at a greater or lesser risk of offending or victimization based on their illegal status (which could make them more vulnerable to victimization, more likely to resort to violence to settle disputes, and/or more cautious about engaging in behavior that might draw the attention of authorities), differences in their demographics (if, for example, they are more likely to be young, unattached males), or other factors (such as a greater propensity to engage in unlawful conduct generally). Moreover, regardless of whether illegal immigration increases crime rates, growing numbers of illegal immigrants will naturally lead to greater numbers of crimes and disorders in which they are involved, fueling public concerns. Estimates suggest that upward of 296,000 illegal immigrants convicted of crimes were being held in state prisons and local jails in 2009 and another 53,000 were in federal prisons (U.S. Government Accountability Office, 2011).

State and Local Involvement in Immigration Enforcement

State and local criminal justice authorities have long cooperated with federal immigration authorities in identifying and removing illegal immigrants involved in criminality. During the past decade, however, state and local police have become more heavily and formally involved in immigration enforcement. First, federal policy makers have sought to increase cooperative efforts with state and local criminal justice authorities. Under the federal 287(g) program, enacted in 1996, state and local police and correctional agencies can enter into partnerships with federal authorities that give federal immigration enforcement powers to selected officers in the participating agencies. As of September 2011, 68 state and local agencies were participating in the program (Immigration and Customs Enforcement [ICE], 2012a). Of these partnerships, 35 were task-force or combined jail-enforcement–task-force agreements deputizing local or state law enforcement officers to conduct immigration enforcement (the remaining were agreements pertaining to jail enforcement only).

Many more law enforcement agencies work with federal Immigration and Customs Enforcement (ICE) through other programs including the Secure Communities Program, the Criminal Alien Program (CAP), and related efforts. The Secure Communities Program, launched in 2008, enables law enforcement and correctional agencies to check automatically the fingerprints of detainees against federal databases that include information about immigration violations. As of June 2012, more than 3,000 jurisdictions, representing 97% of all local jurisdictions nationwide, were participating in the program (ICE, 2012b). Furthermore, ICE works with prisons and jails around the country to identify and remove criminal aliens through its CAP program (ICE, 2012c).

As a result of these and other enforcement efforts, ICE reported that removals of illegal immigrants rose from 245,601 in fiscal year 2007 to 319,077 in fiscal year 2011 (ICE, 2012d).[1] As participation in these programs has grown, ICE has sought to emphasize the removal of repeat immigration violators and illegal immigrants who have committed criminal offenses; together, these groups constituted three quarters of persons removed in fiscal year 2011. Critics have argued, however, that these programs have had a net widening effect, leading to the removal of many people apprehended for minor offenses, and that they undermine trust of law enforcement in immigrant communities (e.g., see Rodriguez, Chishti, Capps, and St. John, 2010). An analysis of 287(g) in selected jurisdictions of North Carolina, for example, revealed that 80% to 90% of those processed through the program were charged with misdemeanors (Coleman, 2012).

State and local police also have become more heavily involved in immigration enforcement as a result of state laws and local ordinances directing them to engage in these efforts. From 2005 through the first quarter of 2012, more than three dozen states passed numerous bills related to immigration enforcement issues (calculated from National Conference of State Legislatures [NCSL], 2012a; Newton, 2012).These laws have had several purposes such as funding immigration enforcement activities, establishing guidelines for the transfer of illegal immigrants to federal authorities, and mandating that police conduct immigration checks on arrestees or other people they detain (Newton, 2012). Laws in the latter category have stirred the most controversy. One of the most notable and far-reaching of these statutes is a 2010 Arizona law that requires police to check the immigration status of arrestees and other detained people (including those stopped for traffic violations) whom the officers suspect of being in the country illegally. Similar laws were passed in five additional states in 2011 (Alabama, Georgia, Indiana, South Carolina, and Utah) and were under consideration by others in 2012 (NCSL, 2012b). Implementation of these laws has been delayed by legal challenges from the federal government and civil rights groups. However, a June 2012 ruling by the U.S. Supreme Court on the Arizona law states that although state and local authorities cannot arrest people for immigration violations, they can check the immigration

1. From fiscal year 2008 through fiscal year 2011, another 77,000 to 105,000 persons per year left voluntarily after processing by ICE.

status of people that they detain (for reporting to federal officials), thus, potentially paving the way for wider adoption of these policies (*Arizona et al. v. United States*, 2012). In addition to these state laws, at least 11 local jurisdictions (among them Prince William County) have passed ordinances since 2000 engaging local authorities in immigration enforcement (O'Neil, 2010).[2]

Local immigration enforcement has been examined in two national surveys conducted with municipal police departments and sheriff's offices between 2007 and 2010 (Varsanyi, Lewis, Provine, and Decker, 2012; also see Decker, Lewis, Provine, and Varsanyi, 2009).[3] In terms of policy, 39% of responding city agencies and 33% of responding sheriffs had written policies for dealing with illegal immigrants, 3% of the city agencies and 15% of the sheriffs provided for federal training of officers to assist in immigration investigations, and 3% of the city agencies and 36% of the sheriffs had an agreement with ICE for managing illegal immigrants in custody. Sheriffs seem to cooperate more extensively with immigration enforcement because most of them operate local jails, coupled perhaps with the fact that they are elected officials (which can make them more sensitive to community sentiment regarding the issue). However, most of the chief executives in both the city and sheriffs agencies reported that, irrespective of written policies, their officers typically conducted immigration checks and/or contacted ICE when handling suspected illegal immigrants arrested for crimes. The share of agencies reporting that their officers conducted these checks ranged from 87% to 89% for violent crime arrestees (and 64% to 81% for domestic violence arrestees) to 51% to 67% for nonviolent arrestees without a criminal record (in each case, the percentage was higher among sheriffs). However, police are considerably less likely to run immigration checks in nonarrest situations; 21% to 27% felt their officers would likely run immigration checks when detaining people for traffic violations (this does not mean that they are required to do so), and 15% to 20% said their officers would run them when dealing with crime victims, complainants, or witnesses (again, sheriffs ranked higher on each measure). The involvement of local police in these activities could increase considerably, however, based on the recent Arizona case.

Impacts of Police Immigration Enforcement

As the involvement of local police in immigration enforcement has grown, leading law enforcement associations, practitioners, and scholars have expressed several concerns about

2. It also should be noted that several states and localities have passed laws restricting the ability of police to make immigration inquiries or to engage in immigration enforcement (often referred to as "sanctuary" policies).

3. The survey of municipal police departments focused on cities of 65,000 or more people, whereas the survey of sheriffs focused on jurisdictions having 20,000 or more people and a foreign-born population accounting for at least 6% of the total population. Similar findings also have come from surveys conducted with other specialized samples of police agencies (Guterbock, Koper, Vickerman, Taylor, Walker, and Carter, 2010; Police Executive Research Forum, 2008).

this trend (International Association of Chiefs of Police, 2007; Major City Chiefs, 2006; Police Executive Research Forum, 2008; Police Foundation, 2009). Chief among these concerns are that immigration enforcement will hurt communication and collaboration with immigrant communities, discourage crime reporting by victims and witnesses in immigrant communities, make illegal immigrants more vulnerable to victimization, and increase the likelihood of actual or perceived racial profiling among officers. Other concerns include impacts on agency resources, potential legal complications, and the subordination of local concerns to federal priorities (Decker et al., 2009).

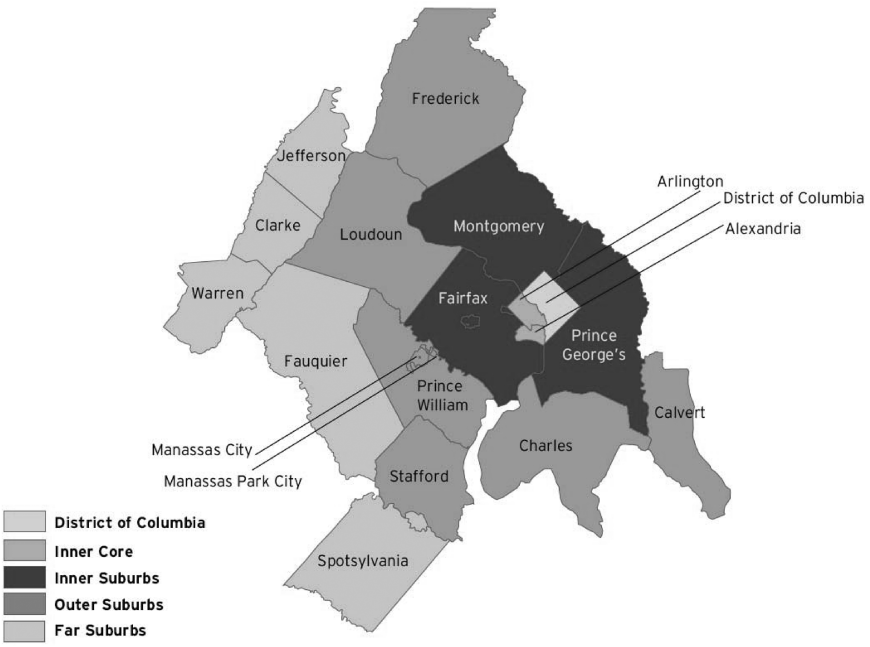
Evidence for some of these possibilities comes from Costa Mesa, CA, where a 2005 city proposal to involve jail and selected police personnel in immigration enforcement generated considerable protest in the community. Although that plan was later abandoned in favor of one that assigned a federal immigration agent to the local jail, surveys done with Latino community members in 2002 (precontroversy) and 2007 (postcontroversy) showed that respondents had more negative perceptions of the police and were less likely to report crimes to them in 2007 (Vidales, Day, and Powe, 2009). Similarly, national surveys show that Hispanics are strongly opposed to local police involvement in immigration enforcement and that worries about deportation of family members and friends is common among Hispanics, particularly for those who are foreign-born (Pew Hispanic Center, 2007).

How local immigration enforcement affects crime will almost certainly be another central issue in the debate, but it has received very little empirical study to date. One national study found that crime declined from 1996 to 2002 in jurisdictions that received federal reimbursement (through the federal State Criminal Alien Assistance Program) for incarcerating criminal offenders in the country illegally (Lilley and Boba, 2009). However, it was not clear whether these effects stemmed from incapacitating and deporting immigrant offenders or from a more general expansion of jail and prison capacity facilitated by the funding. Case studies of local immigration enforcement efforts, in contrast, have focused on issues related to politics, implementation, and/or community relations (e.g., Armenta, 2012; Coleman, 2012; Varsanyi et al., 2012; Vidales et al., 2009).

In the study reported here, we examine the issue of immigration enforcement and crime through a multimethod study of an immigration enforcement policy enacted in Prince William County, Virginia, in 2008. As described in the subsequent discussion, the policy evolved over time, initially requiring police to conduct immigration checks on any detained persons suspected of being in the country illegally (a particularly aggressive enforcement policy) and later only requiring such checks on arrestees. Thus, the study has implications for how crime and police–community relations may be affected by immigration enforcement policies varying in scope and aggressiveness.

FIGURE 1

Map of the Washington, DC, Region



Source: Singer et al. (2009).

Study Setting and Context

Prince William County is a northern Virginia locality in the outer suburbs of Washington, DC (Figure 1). The County has a population of slightly more than 400,000 that is 62% White, 22% Black, and 16% of other races. Approximately 20% of the County's population is of Hispanic origin. Prince William is an affluent county, with a median household income greater than $91,000 and only 5% of its population living in poverty.[4] In 2007, the last full calendar year before the implementation of its immigration policy, the County's rates of violent and property crimes, 163 per 100,000 and 1,822 per 100,000, respectively, were substantially lower than their corresponding averages for the nation and for other suburban areas (Federal Bureau of Investigation, 2008; Prince William County Police Department [PWCPD], 2009).

Until recently, Prince William County was a relatively rural community that was not generally regarded as a major suburb of Washington, DC. However, as described by Singer, Wilson, and DeRenzis (2009), the County has experienced rapid and dramatic demographic

4. See U.S. Census figures at factfinder2.census.gov.

changes in recent decades. Its population swelled from 215,686 in 1990 to 357,503 in 2006, an increase of 66%. During this period, the County also became a magnet for immigrants coming to the Washington, DC, area. The share of the County's population that was foreign-born roughly doubled from 11.5% in 2000 to 21.9% in 2006. Immigrants moving to the County were largely of Hispanic origin; consequently, Hispanic residents increased from 9.8% of the County's population in 2000 to 19.1% by 2006. These changes were driven in large part by surging housing prices in the Washington, DC, area, which pushed people to the more distant suburbs in search of affordable housing, and by job growth in categories such as construction, leisure, and hospitality, which offer more opportunities for immigrants.

These trends created various strains on public works and services in the County (e.g., congested roads and crowded schools) and led to growing complaints by residents about deteriorating physical and social conditions in neighborhoods with high numbers of immigrants: unkempt homes and lawns, signs of overcrowded housing, noise levels, overcrowded schools with growing numbers of children having English language deficiencies, graffiti, hit-and-run accidents, men loitering at day laborer sites, gang activity, rising street crime (although the crime rate in the County was actually decreasing during this time), and other similar problems (Guterbock et al., 2010; Singer et al., 2009). This reaction also spurred the formation of political activist groups that pressured County officials to crack down on illegal immigrants, who, although their numbers were unknown, were perceived as contributing substantially to these problems and who provided an obvious target for policy efforts to address them.

Development, Implementation, and Evolution of the County's Immigration Enforcement Policy

As pressures and tensions in the County grew, the Prince William County Board of County Supervisors passed a resolution in July 2007 that required the Prince William County Police Department (PWCPD) to enter into a 287(g) agreement with ICE and to check the immigration status of anyone they detained for a violation of state or county law, including traffic stops, if there were probable cause to believe the person was in the country illegally.[5] This resolution touched off a highly contentious public debate in the County that was covered extensively in the local, national, and Spanish media. The public debate, which included demonstrations and massive e-mail and phone campaigns to sway Board members, culminated in a highly charged 15-hour Board meeting in October 2007, at which many people offered comments both for and against the policy (Singer et al., 2009). The Board nonetheless gave final legal force to the policy at that meeting by approving the plan that PWCPD had developed, at the Board's direction, to implement the policy.

5. The Board also instructed other county staff to determine legal grounds for withholding public benefits and services from illegal immigrants.

After several months of planning and preparation, PWCPD implemented the policy in March 2008. The Department established a seven-person 287(g) unit to work with ICE on targeting serious immigrant offenders, and it instructed other officers (after appropriate training) to conduct immigration checks as mandated by the policy. However, this version of the policy was suspended at the end of April 2008 as a result of fears that PWCPD might be vulnerable to lawsuits alleging racial profiling. Throughout the debate over the policy, PWCPD's chief had expressed several concerns about its impact on PWCPD and the community. Among these were that the policy would drain PWCPD resources, expand the role of PWCPD from traditional policing into what has traditionally been a federal responsibility, impact public trust in a negative manner among immigrant communities leading to fear of cooperation in reporting crime and assisting police, set unrealistic expectations among those in favor of the policy about PWCPD's authority to address the immigration issue, and possibly expose PWCPD to racial profiling accusations. To guard against the latter, the Chief advocated for funding to install cameras in all PWCPD patrol cars. However, the cost of these cameras—an estimated $3.2 million—was prohibitive. Consequently, the Board modified the policy at the end of April 2008.

The new policy, which was implemented in July 2008 and remains in effect, mandates immigration checks only for arrestees but gives officers the discretion to conduct an immigration check on someone they have detained if there is reason to believe that the detainee is an illegal immigrant. Officers who are not part of the 287(g) unit cannot arrest someone solely for federal immigration violations absent an ICE detainer or evidence that the person is a deported felon (although they can report this information to PWCPD's 287(g) unit). However, suspicion that a detainee is an illegal immigrant might lead an officer to arrest the subject if the officer has grounds for issuing a summons to the subject and feels there is reason to believe that the subject will not appear in court for the summons.[6]

At the same time these events were unfolding, the local jail, which is directly overseen by a regional jail board rather than by the County Board of Supervisors, implemented its own 287(g) program. The jail facility began running immigration checks on arrestees in July 2007 and by April 2008 was running them on all persons of foreign birth committed to the facility. This policy shift did not receive as much attention in the public debate over immigration in Prince William County, but it has been a central element of immigration enforcement in the County.[7]

6. On a related note, subjects may be arrested for summons offenses in the County if they lack identification or any time they present false identification.

7. PWCPD immigration checks are not entirely redundant with those performed at the local jail because arrestees are first brought before state-appointed magistrates who make decisions about pretrial release and bail. PWCPD officers inform magistrates whether there is evidence that an arrestee is an illegal immigrant, but magistrates are not required to jail illegal immigrants that do not have ICE detainers. A magistrate may thus release a suspected illegal immigrant on personal recognizance or bail if the subject has not committed a serious offense, is not a danger to anyone, and seems to have strong

TABLE 1

Arrests of Illegal Immigrants in Prince William County for UCR Part I Crimes, 2009

Part 1 Crimes	Total Persons	Illegal Immigrants	Illegal immigrants as % of Arrestees
Murder	12	0	0%
Rape	37	3	8%
Robbery	117	4	3%
Aggravated Assault	175	16	9%
Burglary	191	8	4%
Larceny	1,467	88	6%
Motor Vehicle Theft	54	2	4%
Total	*2,053*	*121*	*6%*

Source. Taken from PWCPD's 2009 Crime Statistics (PWCPD, 2010: 16).

Overall, immigration enforcement efforts in Prince William County are particularly comprehensive relative to those of other localities. The County is one of the few jurisdictions in the nation where both local police and jail authorities participate in the 287(g) program and check the immigration status of all arrestees as a matter of policy. Furthermore, the initial County policy that required police to check the immigration status of all persons detained was particularly far-reaching and rare. Recent changes in state and local laws suggest, however, that such policies are likely to become more common.

Immigration Enforcement Activity

From March 2008 through June 2010, PWCPD officers had 2,984 contacts with suspected illegal immigrants (figures provided to the authors by PWCPD). Officers arrested 79% of these suspects for various violations, released 8% with a summons, and released 13% after a field interview. Illegal immigrants were most likely to be arrested for relatively minor violations. In 2009, for example, 121 illegal immigrants were arrested for Uniform Crime Reports (UCR) Part I offenses and 774 were arrested for UCR Part II offenses (Tables 1 and 2). Illegal immigrants accounted for 6% of arrestees that year for both Part I and Part II offenses. With the exception of larceny, the number of arrests involving illegal immigrants was quite low for each Part I category—typically no more than eight. Arrests of illegal immigrants were most substantial, both in number and as a percentage of arrests, for public drunkenness (269 arrests accounting for 20% of all public drunkenness arrests in 2009), driving under the influence (DUI) (286 arrests representing 13% of all DUI arrests in

community ties. Specific figures on these releases are not available, but informal estimates suggest that they are not uncommon.

TABLE 2

Arrests of Illegal Immigrants in Prince William County for Other Selected Crimes, 2009

Other Crimes	Total Persons	Illegal Immigrants	% Illegal Immigrants
All UCR Part II Arrests	12,254	774	6%
Public Drunkenness	1,365	269	20%
Driving Under the Influence (DUI)	2,138	286	13%
No Operators License	2,085	205	10%

Source. Taken from PWCPD's 2009 Crime Statistics (PWCPD, 2010: 17).

2009), and driving without a license (205 arrests constituting 10% of all arrests for driving without a license in 2009).[8]

For its part, the local jail issued immigration detainers for 2,783 persons from July 2007 through June 2010 and released 2,499 illegal immigrants to ICE authorities (these figures, provided by the local jail, include arrestees from PWCPD as well as those from other local jurisdictions, most notably the independent cities of Manassas and Manassas Park).[9] County officials were unable to obtain data from ICE on the number of these arrestees who were deported or released back into the community. Because ICE tends to focus its resources on serious offenders and others who have been previously deported, it is likely that many of the illegal immigrants arrested for minor offenses were released back into the community after their stay in the local jail.[10] However, although precise figures are not available, it seems that less than 9% of the persons released to ICE by the jail's 287(g) unit during its first 3 years were rearrested and returned to the facility for new crimes.

8. PWCPD's 287(g) unit played a small, specialized role in the agency's overall immigration enforcement efforts, focusing on more serious offenders and issuing about seven detainers per month as of July 2009.

9. Local jail officials have discretion over whether to issue detainers for illegal immigrants, particularly those who have committed minor offenses and have no criminal history. Thus, this figure does not include all illegal immigrants identified by the jail's 287(g) unit.

10. If Prince William County's experiences reflect the estimates provided in a 2009 U.S. Government Accountability Office report on ICE's operations, approximately two thirds may either have agreed to voluntary deportation or been detained pending deportation proceedings. More recently, this result may have changed in response to policy changes within ICE that have focused priorities on more serious offenders. County jail officials estimated informally that approximately half of the people they turned over to ICE during fiscal year 2010 (July 2009–June 2010) were released on recognizance (per ICE's instructions) without being taken to an ICE facility. Likely, more are released after a temporary stay in an ICE facility. In 2008, for example, ICE released more than 51,000 detainees into communities around the country via bond, orders of supervision or recognizance, or parole (Schriro, 2009).

Public Education and Outreach Efforts

Another important aspect of the policy's implementation was an extensive public education campaign undertaken by PWCPD. From the outset, PWCPD commanders were concerned about the public's perception of the immigrant enforcement policy and about the policy's impact on police–community relations, particularly as they pertain to PWC's immigrant and larger minority community. Accordingly, PWCPD designed a public education effort with two broad goals. One was to assuage fear and distrust that the policy might cause in the immigrant community. The other goal was to inform the broader public, and particularly those in favor of the policy, as to what the police could and could not do under the policy. As of early September 2008, PWCPD had conducted more than 100 meetings to discuss the policy with religious, educational, and special interest groups representing all sides of the issue, and the media, most of which the Chief attended. The Department also had held sessions with more than 300 County employees that included school faculty, school security personnel, and staff from social service agencies. In these meetings, PWCPD personnel discussed their philosophy of carrying out the new mandate in a fair, lawful, and reasonable manner. They also emphasized three elements of the policy:

1. It would focus on criminal illegal immigrants, meaning those who are in the country illegally who commit crimes;
2. PWCPD would protect crime victims and cooperative witnesses regardless of their immigration status;
3. the Department would not engage in racial profiling.

PWCPD leaders sought to assure people that the police would not be "head hunting" or conducting sweeps for illegal immigrants. PWCPD also prepared informational materials, provided in both English and Spanish, to educate the public about the policy. These materials have included news releases and brochures distributed through meetings, everyday police–citizen contacts, and PWCPD's website.

Assessing the Impacts of the Policy

The analyses and results reported in the subsequent discussion are taken from a larger study commissioned by PWCPD and the County to examine the experiences of PWCPD and other criminal justice actors in implementing the policy and to assess the effects of the policy in the County on demographic trends (including the number of illegal immigrants), neighborhood conditions, crime and disorder, and the attitudes of immigrants and other residents toward PWCPD and the County more generally (Guterbock et al., 2010). In this article, we focus on how the policy affected crime and disorder, as improving public safety was one of the major goals of the policy. However, we also note a few findings from the broader evaluation, completed in late 2010, that help set the context for our assessment of the policy's impacts on crime.

First, the County's Hispanic population, which had expanded by 150% from 2000 to 2006, leveled off, growing by only 1.2% in 2007 and 0.7% in 2008. Although Prince

William County accounted for most of the growth in the DC area's Hispanic population from 2000 to 2006, nearly all growth in this population after 2006 occurred outside the County. Furthermore, the number of noncitizen residents in the County declined by approximately 7,400 from 2006 to 2008. Although precise estimates of the illegal immigrant population are not available, several proxy measures suggest that this number declined by 2,000 to 6,000 from 2006 to 2008. The County's Hispanic population also was restructured; unattached young adults (mostly male) left and were replaced by Hispanic couples, somewhat older adults, and families with small children, all more likely to be English speakers. It is likely that the immigration policy played some role in these changes, although a severe downturn in the County's economy and housing market that began in 2006 also likely contributed to these trends by reducing employment opportunities.[11]

Second, the policy created a rift between the immigrant community and PWCPD (as well as the County government more generally), at least temporarily. Public opinion surveys conducted in Prince William County over many years showed that satisfaction with police among Hispanic residents dropped from a recent high of 97% in 2005 to 73% in 2008 (the drop began noticeably in 2007). By 2010, however, this overall rating had rebounded to approximately 93%, likely as a result of the change in the policy in 2008, PWCPD's outreach efforts, and attempts at fair administration of the policy, or some combination of these factors. Nonetheless, some ethnic differences were still evident in more specific questions about police attitudes, behaviors, and fairness. As indicators of police legitimacy, these trends have potentially important ramifications for crime reporting, cooperation with police, and compliance with law in Prince William's Hispanic community (e.g., see National Research Council, 2004).

Overview of Data and Methods

We evaluated the policy's impacts on crime and disorder in Prince William County using several data sources and techniques. First, we conducted interrupted time series analyses of weekly trends in various categories of crime reports and calls for service in Prince William County over all or portions of the 2000 to 2009 period. In these models, we tested for effects stemming from both the announcement and the implementation of the County's immigration enforcement policy. Second, we employed a nonequivalent control group design to compare changes in annually reported violent and property crimes in Prince William with those of nine other localities in the Washington, DC, area from 2005 through 2009.[12] Third, we complemented these analyses with an examination of post-policy trends

11. Similarly, the recent decline in the U.S. economy (particularly in the housing construction industry) and heightened national immigration enforcement efforts are thought to have been major factors that greatly reduced migration from Mexico into the United States between 2005 and 2011 (Passel, Cohn, and Gonzalez-Barrera, 2012).

12. Our analyses of crime data from Prince William County exclude data from several small independent cities in the County that have their own police forces.

in Prince William County in the following measures, which we discuss more briefly: arrests of illegal immigrants by PWCPD (2008–2009); crime victimization and crime reporting among Prince William residents as measured through community surveys (2008–2010); and PWCPD officers' perceptions of crime and disorder as measured through police personnel surveys (2008–2009). We used these postpolicy measures as additional indicators with which to assess possible effects from ongoing enforcement of the policy after March 2008. We describe the methods of these analyses, as well as their results, in more detail in the sections that follow. We then triangulate across these sources and results to draw conclusions about the policy's impacts.

One general limitation to the study is that historical data on crimes committed by illegal immigrants in Prince William County are unavailable. Consequently, it is possible that recent changes in crime have been a result of changes in offending by native residents, legal immigrants, illegal immigrants, or some combination thereof. Postpolicy PWCPD arrest data suggest that illegal immigrants account for a small percentage of offenders for most crime types, particularly serious ones. Nonetheless, these data may not provide a reliable indicator as to the involvement of illegal immigrants in crime prior to the policy.

In addition, changes in crime must be assessed in light of the possibility that the policy has had multiple and opposing effects on actual and reported crime. On the one hand, it may have reduced crime in Prince William County in several ways—by scaring away would-be immigrant offenders and victims who were here illegally, by incapacitating illegal immigrant offenders (thus leading to their deportation in some cases), and by deterring criminal and disorderly conduct by other illegal immigrants who remained. On the other hand, reductions in crime also might reflect a reduction in crime reporting by illegal immigrants and possibly by legal ones as well. Furthermore, the policy could have conceivably increased crime or calls for service if it prompted more offending against immigrants (who may have been perceived as less likely to report crimes to police and thus more vulnerable after the policy) or have made some native residents more likely to call police about various matters (such as noise or loitering) as a means to remove or intimidate people whom they believed were illegal immigrants.

Other general limitations include a lack of data on the dispositions of arrested immigrants (as determined by ICE) as well as the difficulty of conducting a rigorous comparison group analysis as described in the subsequent discussion. In light of these challenges, we sought to assess the effects of the Prince William County policy using multiple data sources and techniques. Moreover, even with these qualifications, the study is highly salient to the current debate regarding immigration enforcement; indeed, recent policy trends, coupled with the highly divisive nature of the debate and the lack of evidence on the impacts of local immigration enforcement, underscore the importance of informing public dialogue on this issue through careful analysis and interpretation of the best available data.

Analyses and Results

Time Series Analysis of Reported Crimes and Calls for Service in Prince William County

Prince William's annual Part I crime rate generally declined through the 2000s until bottoming out in 2007 (PWCPD, 2009, 2010). From 2007 through 2009, the crime rate held steady at between 19 and 20 per 1,000 (PWCPD, 2010: 8). Behind this general trend, however, there was substantial variability in trends for different types of offenses. Violent crimes, primarily robbery and aggravated assaults, climbed from 2004 to 2006 but fell sharply during 2007 and 2008. According to PWCPD's annual reports, robbery and aggravated assault declined 23% and 18%, respectively, in 2007. Aggravated assaults then declined another 36% in 2008, whereas robbery declined by 9%. Not surprisingly, these trends stirred debate over whether the immigration policy reduced violent crime. Within PWCPD, the decline in robbery was attributed to a robbery reduction initiative launched in 2006 (PWCPD, 2009: 10). The reasons for the decline in aggravated assault, however, seemed less clear.

To examine the effects of the policy more rigorously on these and other criminal and disorderly behaviors, we estimated interrupted time series models testing for postannouncement or postpolicy changes in several categories of crime and calls for service in the County. These models enabled us to control for long-term trends and patterns in crime that may have been affected by the County's changing economy, prior police initiatives, and other factors. Specifically, we analyzed PWCPD incident reports recorded in the agency's records management system for UCR Part I violent and property offenses from January 2003 through December 2009, focusing on trends in total violent crime (i.e., murder, rape, robbery, and aggravated assault), total property crime (i.e., burglary, larceny, and auto theft), aggravated assault, and robbery. In addition, we analyzed calls for service to PWCPD over the period of January 2000 through December 2009 for the following types of serious and minor incidents: personal crimes (consisting primarily of various types of assaults and robberies), property crimes (burglary, vandalism, theft, auto theft, and fraud), disorderly behaviors/minor crimes (disorderly conduct, public drunkenness, loud parties, trespassing, and the like), drug-related crimes, and driving under the influence.[13]

13. We used calls for service as a complement to our analysis of official reports. Although calls for service data are subject to potential problems with both over- and underreporting (Klinger and Bridges, 1997), they are less affected by police discretion than are police incident or arrest data, and they are generally regarded as the most comprehensive source of data on criminal and disorderly events (Sherman, Gartin, and Buerger, 1989; Warner and Pierce, 1993). As a result, they are especially useful for measuring minor offenses and disorderly behaviors that are less likely to result in official reports or arrests whether resulting from decisions of officers, complainants, or victims.

    We selected the respective timeframes of the incident and call data based on data availability and preliminary inspection of the various data series. We sought to use a sufficiently long series to model preintervention trends rigorously while minimizing excessive variability as a result of significant historical changes in social conditions and/or data systems. As shown in the subsequent discussion, our results for total personal and property crimes are similar across both data sources and timeframes.

We aggregated all incident and call data into weekly time series and tested each series for changes associated with two key policy dates discussed earlier: July 2007, when the Board of County Supervisors passed the initial immigration resolution (potentially creating an announcement effect) and the local jail began its 287(g) program; and March 2008, when PWCPD began implementation of the first version of the policy. We tested for effects associated with each date in separate models. For each outcome series, we estimated models including the selected intervention date, a series of monthly indicators to capture seasonal effects, a time trend indicator (if appropriate), and autoregressive-moving average terms to capture autocorrelation in the model residuals.[14] Prior to model estimation, we tested each series for stationarity via the Augmented Dickey-Fuller (ADF) regression test (e.g., Davidson and MacKinnon, 1993: 702–715; Elder and Kennedy, 2001) and found that all series were stationary around a mean or time trend; in the latter instances, a time trend term was included in the corresponding model. Based on examination of autocorrelation functions for each series, we fit each model with a combined first-order autoregressive, moving-average process to remove serial correlation from the model residuals (e.g., see McCleary and Hay, 1980).[15] In sum, these procedures controlled for trend, drift, seasonality, and other systematic within-series variation; hence, they accounted for the effects of preintervention trends (if any) and other unmeasured factors that operated consistently throughout the study period. (Descriptive data for the time series are included in Appendix tables A1 through A4.)

Key results from the models are shown in Table 3.[16] Overall, the policy did not affect most categories of crime and calls for service. Postpolicy changes in property crimes (as measured by both calls and reports for Part I property offenses), disorder crimes, drug offenses, and DUI were modest, variable in direction, and not statistically significant. In contrast, we found indications of a statistically significant reduction in violence based on both reports for Part I violence and calls for personal crimes. Part I violent crimes declined by 10% to 11% after the policy, whereas calls for personal crimes declined 8% to 9%. These results were nearly the same whether using the July 1, 2007 or March 1, 2008 intervention date, which suggests that the impact of the policy predated its implementation in March 2008.

14. We focus on abrupt, permanent impacts associated with the policy's announcement and implementation. We did not test for other types of gradual or temporary impacts (e.g., see McCleary and Hay, 1980) because they did not seem to fit visual patterns in the data, and because the parameters of such models can be difficult to estimate accurately (McDowall, Loftin, and Wiersema, 1996).

15. We examined Ljung-Box Q statistics for serial correlation in model residuals through 52 lags. For each series, we estimated a variety of models having autoregressive or moving average processes of the first or second order. The mixed autoregressive, moving average models best fit the data as determined by Akaike's information criterion (AIC) and Schwarz's Bayesian criterion (SBC) fit measures.

16. A more detailed presentation of the model results is available in Guterbock et al. (2010: Appendix D).

TABLE 3

Pre- and Postpolicy Changes in Weekly Crime Reports and Calls for Police Service in Prince William County, 2003–2009 (Crime Reports) and 2000–2009 (Calls for Service)

Offense / Call Category	Models using July 1, 2007 as Intervention Date	Models using March 1, 2008 as Intervention Date
Reports for all Part I violent crimes ($n = 365$ weeks)	Impact term: **−1.84 ($p = .01$)** % change: −10.16%	Impact term: **−1.94 ($p = .02$)** % change: −10.76%
Reports for aggravated assault ($n = 365$ weeks)	Impact term: **−2.25 ($p < .01$)** % change: −27.23%	Impact term: **−2.41 ($p < .01$)** % change: −27.50%
Reports for robbery ($n = 365$ weeks)	Impact term: 0.20 ($p = .77$) % change: 0.04%	Impact term: 0.26 ($p = .68$) % change: 0.05%
Reports for all Part I property crimes ($n = 365$ weeks)	Impact term: 1.85 ($p = .66$) % change: 1.25%	Impact term: −0.26 ($p = .92$) % change: −0.18%
Calls for personal crimes ($n = 518$ weeks)	Impact term: **−22.77 ($p < .01$)** % change: −8.37%	Impact term: **−23.66 ($p < .01$)** % change: −8.74%
Calls for property crimes ($n = 518$ weeks)	Impact term: −3.25 ($p = .75$) % change: −1.02%	Impact term: −13.19 ($p = .25$) % change: −4.12%
Calls for disorder crimes ($n = 518$ weeks)	Impact term: −16.54 ($p = .34$) % change: −4.94%	Impact term: −20.27 ($p = .24$) % change: −5.98%
Calls for drug-related crimes ($n = 518$ weeks)	Impact term: 0.70 ($p = .71$) % change: 2.89%	Impact term: 0.58 ($p = .77$) % change: 2.36%
Calls for DUI ($n = 518$ weeks)	Impact term: −0.18 ($p = .88$) % change: −1.02%	Impact term: 1.35 ($p = .55$) % change: 7.87%

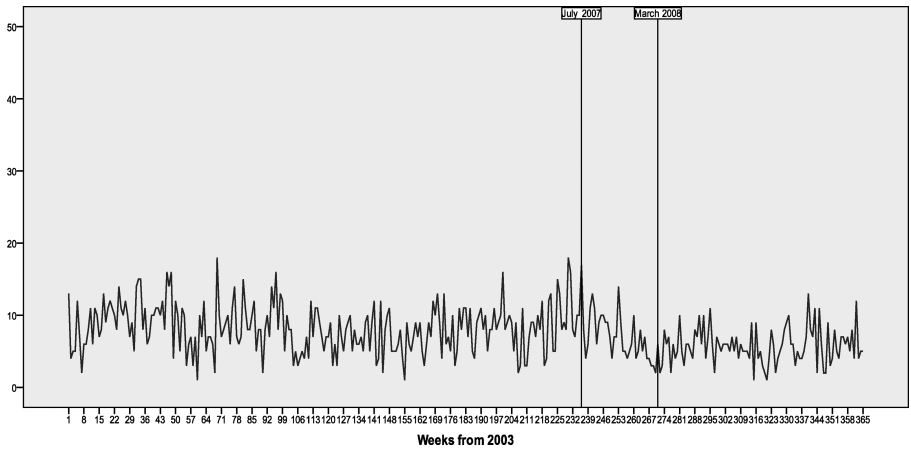
Notes. Coefficients in bold had p levels of .05 or lower. All models included monthly indicators for seasonal effects and autoregressive, moving average parameters for serial correlation. Models for disorder and DUI calls also have controls for time trends.

Further disaggregation of violent offense reports revealed that this change was driven by trends in aggravated assault (see Table 3 and Figure 2); robbery trends, in contrast, did not change after the policy's announcement or implementation.[17] Beginning shortly after July 2007, aggravated assaults dropped by 27% (this is the model-based estimate of change

17. Results for robbery varied based on model specification, with some models suggesting a postpolicy decline and others suggesting an increase. The model shown in Table 3 is the most parsimonious model that provided an adequate fit to the data, and it shows statistically nonsignificant increases associated with the policy dates (this conclusion also fits the basic pattern in descriptive pre–post statistics for the series). Based on our initial examination of the series, we also estimated models including a time trend. These models, which provided better fit measures, suggested that robbery declined in the postpolicy period. However, the correlation between the intervention term and the time trend was approximately –0.8 in each model, suggesting that the terms were highly collinear and that statistical tests for them may not be reliable. As another test, we detrended the robbery series by regressing it on a time trend, the seasonal indicators, and the time series parameters. We saved the residuals from this model and used a *t*-test to examine differences in the average value of the residual series during the preintervention and postintervention periods. These tests indicated that the residual series had lower values during the postintervention period, but these differences were not statistically significant. On balance, therefore, we concluded that the policy did not significantly affect trends in robbery.

FIGURE 2

Aggravated Assaults in Prince William County, 2003–2009 (Weekly)



and reflects a drop of between two and three assaults per month) and remained at a lower level through the end of 2009 (Figure 2).[18] To investigate the timing of the drop in assaults further, we ran a series of models (not shown) testing for changes associated with a series of "phantom" intervention points: six months prior to July 2007, three months prior to July 2007, three months after July 2007, and six months after July 2007. The model coefficients associated with these dates were as follows: 1.4 for January 2007, –0.6 for April 2007, –2.7 for October 2007, and –2.3 for January 2008 (for reference, the coefficients for the July 2007 and March 2008 intervention points, shown in Table 3, were approximately –2.3 and –2.4, respectively). These results provide further confirmation that the drop in aggravated assaults occurred between July and December 2007. The timing of the change strongly suggests that it was caused by the announcement of the policy, perhaps coupled with the initiation of immigration checks at the local jail. (The effect also may have been intensified somewhat by the final passage of the policy by the County Board of Supervisors in October 2007.) No other major police initiatives or changes in the County to our knowledge coincided this closely with the sudden shift in aggravated assault reports. Although the decline in the County's economy and housing market may have driven away some people at high risk for involvement in serious assaults (e.g., young unattached males), this decline

18. The drop in assaults also was specific to aggravated assaults. Supplementary models of simple assaults (not shown) produced mixed results that varied depending on the intervention date. A model using the July 2007 intervention date showed a statistically significant increase in simple assaults, but this change seemed to be temporary, as a March 2008 intervention model showed a statistically nonsignificant decline.

began in 2006 and seems unlikely to have prompted such an abrupt shift in assaults in mid-2007.[19]

In addition, we also conducted further assessments of geographic patterns in the crime trends. Supplemental analyses of aggravated assault and total violent incident reports in specific areas of the County (not shown) indicated that the decline in violence was concentrated in areas of the County with large concentrations of Hispanic residents (Guterbock et al., 2010). This finding would seem to provide some further indication that the change in aggravated assaults was linked to the immigration enforcement policy.

A caveat is that these results could reflect a real drop in assaults, a decline in reporting of assaults by immigrant victims, or some combination of these factors. We return to this issue in the subsequent discussion but first compare trends in reported crime in Prince William County with those in other DC-area localities (focusing particularly on trends in aggravated assaults) and examine other indicators of postpolicy trends in crime and disorder in Prince William County.

Comparisons of Crime Trends in Prince William and Other Area Counties

For the next component of our study, we used a pre–post nonequivalent control group design to compare recent crime trends in Prince William County with those in several other localities in the Washington, DC, area, focusing on cities and counties of 100,000 or more persons from both Virginia and Maryland (we did not include Washington, DC, given its vast differences from suburban Prince William County). Referring to Figure 1, the Virginia localities included Alexandria City and the counties of Arlington, Fairfax, Loudoun, and Spotsylvania.[20] The Maryland counties included Prince George's, Montgomery, Charles, and Frederick.

Like Prince William County, many of these localities have a substantial immigrant population consisting largely of Hispanics. Foreign-born persons accounted for 19% to 29% of the population in Alexandria, Arlington, Fairfax, Loudoun, Montgomery, and Prince George's counties as of 2006 (Singer et al., 2009: 8). (They accounted for 22% in Prince William County.) A few, notably Loudoun (which neighbors Prince William), Frederick, and Spotsylvania counties, also experienced a growth rate in their immigrant population that was similar to or larger than that of Prince William from 2000 to 2006

19. To illustrate, after rising from 10,638 in 2001 to 16,163 in 2005, building permits in the County dropped to 11,368 in 2006 (a 30% decline) before falling further to 3,289 by 2009 (based on analysis of public works data from the County). Similarly, mortgage applications in the County dropped 28% from 29,751 in 2005 to 21,532 in 2006 after having risen steadily from 2000 to 2005 (based on analysis of Home Mortgage Disclosure Act data maintained by the Federal Financial Institutions Examination Council).

20. Stafford County, Virginia, was excluded from the analysis because it did not report complete data to the Uniform Crime Reports program for all years under study.

(Singer et al., 2009). (Selected characteristics of the study jurisdictions are presented in Appendix Table B.)

We did not have the data necessary to conduct formal time series analyses of weekly trends in crime reports and calls for service in the comparison jurisdictions. Therefore, the comparative analysis is based on a descriptive assessment of mean changes in annual reports of Part I violent crime, aggravated assault, and Part I property crime for Prince William County and the comparison jurisdictions from 2005 through 2009.[21] These analyses should thus be viewed cautiously, as they are based on short-term trends and do not include formal statistical testing or statistical controls for social factors (other than Prince William's immigration policy) that may have differentially influenced changes across the jurisdictions during this timeframe.[22] Nonetheless, comparing trends in Prince William County with those in several other localities in the DC area provides some indications as to whether broader regional trends may have impacted changes in crime in Prince William.

For each jurisdiction and crime category, we computed the jurisdiction's average rate of crime per 100,000 persons for the years 2005 and 2006 (i.e., the prepolicy period) and for the years 2008 and 2009 (i.e., the postpolicy period). We then examined changes in these averages from 2005–2006 to 2008–2009. These changes are expressed as percentage changes in Table 4.

Focusing on the trends in aggravated assault and other violent crimes, changes were highly variable across the DC region, particularly in northern Virginia. Prince William County had the largest decline in aggravated assault across the region (approximately 47%) and the second largest drop in overall violence (32%). In contrast, only two of the five comparison jurisdictions in Virginia and one of the four in Maryland experienced a large reduction in aggravated assaults. Serious assaults declined by approximately 28% and 44% in the Virginia localities of Arlington and Alexandria, respectively, and by 18% in Prince George's County, Maryland. Further inspection of UCR annual and monthly assault trends in Alexandria and Arlington (not shown) revealed that the declines in those counties began in 2006 while assaults were still rising in Prince William County. Hence, the decline in

21. Unless otherwise noted, we contrast PWCPD's reported annual crime figures from 2005 through 2009 with those of the comparison jurisdictions as reported in the FBI's Uniform Crime Reports (see fbi.gov/ucr/ucr.htm#cius). The data for Virginia counties are based on reports from the primary law enforcement agency in each county. Some of these counties have independent cities and townships that report their own data to the UCR, although the primary county agencies are responsible for most of the counties' populations and reported crime. Data for Fairfax County did not appear in the UCR for 2005; therefore, the 2005–2006 figures for Fairfax are based on 2006 alone. The figures for the Maryland counties were obtained from the Maryland Governor's Office of Crime Control and Prevention and were aggregated to include all law enforcement agencies in each county (see goccp.maryland.gov/msac/crime-statistics.php).

22. However, our focus on changes does control for fixed differences across the jurisdictions that were constant during this time.

TABLE 4

Changes in Crime Rates in Prince William County and Other Washington, DC, Area Jurisdictions with Populations Greater than 100,000 (Percentage Changes in 2-Year Averages, 2005–2006 to 2008–2009)

Jurisdiction(s)	% Change Total Violence	% Change Aggravated Assault	% Change Total Property
Prince William County	— 31.9%	— 46.7%	— 8.1%
Other Virginia Jurisdictions			
Alexandria City	— 37.6%	— 43.5%	— 4.8%
Arlington County	— 26.1%	— 27.8%	6.7%
Fairfax County	— 14.7%	— 2.1%	12.1%
Loudoun County	32.8%	75.7%	— 8.3%
Spotsylvania County	37.5%	15.2%	27.0%
Average	— 1.6%	3.5%	6.5%
Standard Deviation	(34.6)	(46.3)	(14.1)
Maryland Jurisdictions			
Prince George's County	— 19.9%	— 18.1%	— 15.1%
Montgomery County	— 4.8%	0.3%	3.6%
Frederick County	2.7%	5.3%	4.4%
Charles County	— 3.0%	— 1.5%	— 9.0%
Average	— 6.3%	— 3.5%	— 4.0%
Standard Deviation	(9.6)	(10.1)	(9.6)

Note. Violent and property offenses include UCR Part I offenses in these respective categories.

serious assaults in Prince William, although not entirely outside the range of variability across the region,[23] was substantially larger than that experienced by almost any other large locality in the area (only Alexandria came close), was unique in its timing, and does not seem to have been part of a widespread regional trend. Furthermore, the trend for assaults in Prince William differed notably from those in the County's closest neighbors and in jurisdictions that were experiencing immigration trends similar to those in Prince William prior to 2007: Loudoun, which neighbors Prince William and had a large increase in its immigrant population, had an increase of 76% in aggravated assaults; neighboring Fairfax had only a small decline of 2% in serious assaults; and Frederick and Spotsylvania counties, which also had large increases in their immigrant population, had respective increases of 5% and 15% in assaults.

An additional consideration is that criminal justice authorities (police and/or jail officials) in several of these localities also were conducting immigration checks on arrestees during the study period, in some cases participating in the Secure Communities or 287(g) programs, according to information from ICE, public reports, media accounts, and a 2009

23. As an informal illustration of the latter point, expressing Prince William's change as a standardized score (i.e., a *z*-score) relative to the average rate of change and standard deviation for Virginia jurisdictions yields a statistically nonsignificant value.

survey of DC-area police agencies conducted for this project (Guterbock et al., 2010; also see Rodriguez et al., 2010). However, among the comparison localities, only Loudoun and Frederick counties adopted immigration enforcement policies similar in scope to that of Prince William. Both counties entered into 287(g) agreements in 2008 that expanded the ability of both police and jail authorities to check the immigration status of arrestees and to initiate federal immigration enforcement actions (i.e., issue detainers) against illegal immigrants who were arrested. (As noted, both counties also had experienced rapid growth in their immigrant population during the early 2000s.) But unlike Prince William, Loudoun and Frederick counties both experienced increases in violence during 2008 and 2009. Consequently, there was no consistent tendency across the region for crime to decline in places doing immigration checks on arrestees.

What is perhaps most notable in this regard is that neither of these jurisdictions (nor any of the other comparison localities) experienced the type of dramatic publicity and controversy that Prince William County experienced after the announcement of its initial policy to check the immigration status of all persons stopped by police. In its original form, the Prince William policy was more aggressive and far-reaching than that of the other jurisdictions,[24] and its announcement generated much more attention and debate than did immigration enforcement efforts in other local areas.

In sum, although there may have been some common causes that contributed to reductions in assaults in Prince William County and some of the other localities around the DC area (e.g., the general economic decline that hit the region during the study period), the trend in Prince William seems to have been unique in several respects. The patterns in the comparative analysis, combined with those found in the preceding time series analysis, seem consistent with the notion that the announcement of the original policy in Prince William, and the extensive publicity that it occasioned, contributed to the County's comparatively large reduction in assaults (and/or reporting of assaults) during 2008 and 2009.

Other Indicators of Postpolicy Trends in Crime and Disorder

As a complement to the preceding analyses, we also examined several indicators reflecting postpolicy patterns and trends through 2009–2010 in crime, disorder, and crime reporting in the County. Although these data cannot be used to assess pre- to postpolicy changes, they shed some light on whether the ongoing enforcement of the policy since March 2008 has produced any further abatement in problems related to illegal immigrants and crime.

24. In our survey of area police agencies, Loudoun County police also reported that they inquired about immigration status during some field encounters, but the emphasis of their policy shift in 2008—and public discourse on this issue—involved checking the immigration status of all arrestees (e.g., see Brubaker, 2008a, 2008b).

TABLE 5

Trends in Arrests of Illegal Immigrants in Prince William County, 2008–2009

Crime Category	2008 Arrests per Month of Illegal Immigrants	2009 Arrests per Month of Illegal Immigrants
UCR Part I crimes	6.3 (Mar.–Dec.)	10.1
Public drunkenness	15.4 (Mar.–Dec.)	22.4
DUI	11.1 (Mar.–Dec.)	23.8
Total arrests	63.7 (Mar.–Dec.)	95.8
	72.6 (Jul.–Dec.)	

Notes. Calculated from PWCPD's 2008 and 2009 Crime Statistics (PWCPD, 2009, 2010). Statistics for 2009 are based on the full calendar year. Statistics for 2008 correspond to March–December. Total arrests for 2008 also were available for July–December, the first 6 months during which the current version of the policy was operational.

First, PWCPD arrest statistics show that monthly arrests of illegal immigrants increased from 2008 to 2009 in total and for specific crimes including Part I offenses, public drunkenness, and driving under the influence (Table 5). This trend also is partially confirmed in local jail statistics (not shown) that show a steady trend in immigration detainers issued by the jail's 287(g) unit during this time. These trends could reflect the return of some illegal immigrants to Prince William County as fear of the policy has ebbed, an improvement in the ability of police and jail authorities to identify illegal immigrants over time, or some combination of these factors. Moreover, they suggest that any deterrent effect that the policy may have had on crime most likely occurred prior to the policy's implementation by PWCPD.

Second, we investigated crime victimization and crime reporting among County residents as measured in the 2008, 2009, and 2010 versions of the Prince William County Citizen Survey, an annual survey that has been conducted for the County since 1993 by the Center for Survey Research of the University of Virginia. Each year, the survey entails phone interviews (conducted in English and Spanish) with 1,600–1,750 respondents, including both landline and cell phone users who are selected through random-digit dialing methods. Additional details about the survey methods are available in Guterbock et al. (2010: Appendix G).[25] Beginning in 2008, new questions were added to the survey asking residents whether they (or anyone in their household) had been the victim of any kind of crime and, if so, whether they reported the crime to the police.[26]

For these years, the level of victimization of Hispanic residents (13% to 15%) was somewhat higher than among other residents (11% to 12%), although this difference was not statistically significant (Figure 3).[27] Moreover, victimization rates did not change

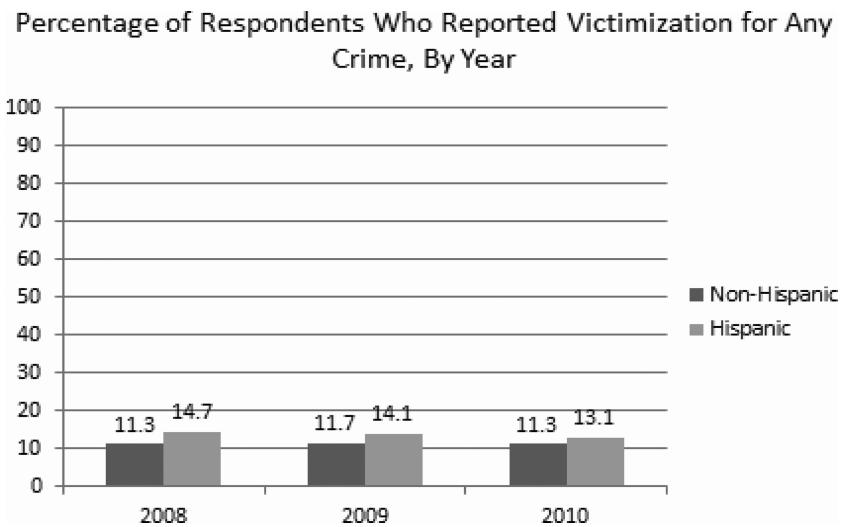
25. Response rates for the study years were estimated to be between 20% and 25% of qualified households in the original samples with sampling errors of approximately plus or minus 3 percentage points.

26. The 2008 survey was carried out in the summer, after the implementation of the policy in March 2008.

27. These statistics are based on victimization that occurred within Prince William County.

FIGURE 3

Trends in Victimization among Prince William County Residents by Ethnicity, 2008–2010



significantly among Hispanics or non-Hispanics over these years. Among those who were victims of a crime, the rates of reporting were statistically indistinguishable for Hispanics and non-Hispanics. In 2008, for example, 79% of both Hispanic and non-Hispanic victims reported their victimizations.[28] Although the sample size of crime victims was small (resulting from the low overall crime rate in the County), these data do not suggest that there is a problem of underreporting of crime by Hispanics in Prince William County. However, we cannot say whether there have been pre- to postpolicy changes in either the rate of victimization or crime reporting in the Hispanic community. Further, we cannot directly address trends in crime victimization or crime reporting among illegal immigrants with these data because the surveys did not record the immigration status of respondents.

Finally, we also examined changes in PWCPD officers' perceptions of various problems related to crime and disorder as measured in agency surveys conducted by the research team during the fall of 2008 and the fall of 2009. Using a four-point scale, officers were asked about the extent to which they had observed problems related to violent and property crime, fear of crime, disorderly behavior, traffic violations, crime reporting, and witness cooperation. Results in Table 6 are based on 274 officers who completed both surveys.[29]

28. The data suggested a slight increase from 2008 to 2010 in reporting among both Hispanics and non-Hispanics, but this was not a statistically significant trend.

TABLE 6

Frequency With Which Prince William County (PWC) Police Officers Witnessed Crime and Disorder Problems, 2008–2009 (1 = never, 2 = occasionally, 3 = often, 4 = regularly/all the time)

"Problem" Item	Time 1 (2008)	Time 2 (2009)
Problems getting nonimmigrant residents to report crime	1.91	1.90
Problems getting legal immigrant residents to report crime	1.84	1.80
Problems getting illegal immigrant residents to report crime	2.38	2.20
Problems getting witnesses to cooperate with the police	2.20	2.07
Physical attacks against officers	1.51	1.59
Verbal threats against officers	1.80	1.83
Violent crimes in PWC	1.92	2.04
Property crimes in PWC	2.17	2.27
Problems with public disorder (e.g., loitering, public drinking, etc.)	2.51	2.60
Problems with traffic violations	2.42	2.59
Fear of crime in certain parts of PWC	2.14	2.22

Notes. Based on responses from 274 PWCPD officers surveyed in the fall of 2008 and the fall of 2009. Scale scores based on these items and others not shown (the latter addressed matters such as housing code violations and charges of bias against PWCPD officers) showed no significant differences in their averages between time 1 and time 2.

Officers reported witnessing most of these problems "occasionally," and there was no statistically significant change in their overall views of the prevalence of these problems from 2008 to 2009.[30] Also, this finding is consistent with earlier ones that the policy had an early effect on serious assaults but did not impact other types of crime. However, 30% to 40% of officers answering the surveys also believed that problems with crime reporting among illegal immigrants occurred often if not regularly.

Conclusions and Implications

Subject to the caveats we have noted earlier, our investigation of data from several sources suggests that the immigration enforcement policy passed by Prince William County in 2007 and implemented in 2008 did not affect most forms of crime in the County (including robberies, property crimes, drug offenses, disorderly behaviors, and drunk driving violations) but was associated with a decline in aggravated assaults. Analyses of trends in offense reports and calls for police service indicate that most types of serious and minor crime did not decline (or increase) after the policy's announcement in July 2007 or its implementation

29. The overall survey response rate was 73% at time 1 and 58% at time 2 (the time 2 respondents included 76% of those who had completed the survey at time 1). Additional details about the survey administration and results are available in Guterbock et al. (2010).

30. Another item of note is that PWCPD personnel that we spoke with during interviews and focus groups did not feel that illegal immigrants had contributed substantially to serious crime in the County either before or after the policy.

in March 2008. Other indicators also suggest that enforcement of the policy over time has not produced ongoing reductions in crime: Arrests of illegal immigrants rose from 2008 to 2009, and postpolicy surveys assessing trends in both crime victimization among County residents and perceptions of crime and disorder among PWCPD officers have shown no significant changes in levels of crime and disorder since the policy's implementation in 2008. Postpolicy data also show that illegal immigrants make up a relatively small proportion of arrestees, particularly for serious crimes (a substantial majority of arrested illegal immigrants are charged with traffic offenses or misdemeanors like public drunkenness). These findings seem consistent in several respects with those from other studies indicating that immigration does not increase crime generally, although they may reflect both low levels of offending by illegal immigrants and a failure of the policy to deter offenders who are illegal immigrants.

However, our analyses also show that the County experienced a substantial reduction in violent crime, namely, aggravated assault, after the announcement of the policy and the implementation of immigration checks by the local jail in July 2007. This decline occurred abruptly and coincided very closely with the announcement of the policy, which makes it less likely that the drop was precipitated by factors like the County's economic trends or other PWCPD crime-reduction initiatives. Furthermore, although violence also declined in some other parts of the DC area during this time, the decline in aggravated assault in Prince William County during 2008 and 2009 was greater than that experienced by any other large county or city in northern Virginia or suburban Maryland, including those doing varying levels of immigration enforcement. All of this suggests that aggravated assaults in Prince William declined in response to the publicity and controversy surrounding the announcement of the initial version of the policy, which required officers to inquire about the immigration status of all lawfully detained persons that they suspected of being illegal immigrants.

The decline in aggravated assault likely reflects a combination of reduced offending, reduced victimization, and possibly reduced crime reporting among illegal immigrants, although we cannot say how much of the drop was a result of each of these factors. Without a more detailed incident-level assessment of assault cases before and after the policy, it also is not clear why the policy would have an impact specific to this type of crime. We speculate that the policy's announcement reduced serious assaults by reducing the number and/or changing the behavior of people at risk of becoming involved in disputes, particularly young, unattached immigrant men. Reporting effects also may have been more pronounced for aggravated assaults because, relative to other offenses like robbery, the actors involved (and perhaps the witnesses as well) are more likely to be family members, friends, or acquaintances (e.g., see Rand, 2009; Roberts, 2008). The propensity of actors or witnesses to notify police in these situations may well have declined after the policy's announcement. Indeed, a significant minority of PWCPD officers believe that reporting of crime by illegal immigrants is still a significant problem. Surveys of residents run counter to this notion

by showing that crime reporting by Hispanics is equivalent to that of non-Hispanics and that reporting by Hispanics did not decline from 2008 to 2010.[31] Nevertheless, those data cannot be used to assess crime reporting specifically by illegal immigrants or to examine before and after changes associated with the policy.[32]

Taken at face value, nonetheless, the magnitude of the drop in aggravated assault after the policy's announcement, approximately 27% according to our estimates, also may imply that the policy had collateral effects extending to assaults that did not directly involve illegal immigrants. Judging from 2009 arrest data, illegal immigrants perpetrate approximately 9% of aggravated assaults in Prince William County. The notion that an additional 27% of aggravated assaults involved illegal immigrants as offenders and/or victims prior to the policy is debatable. However, one possible explanation is that the policy also reduced assaults or reporting of assaults by people who are not illegal immigrants. Hispanic residents connected to illegal immigrants in some way—through, for instance, household residence or networks of family and friends—may have become less likely to report assaults to police for fear that they might draw the attention of police to their family or associates who were in the County illegally. Some legal Hispanic residents also may have felt that police would be generally suspicious of them. Research elsewhere has suggested that controversies surrounding immigration enforcement can reduce the inclination of Hispanics to report crime to police (Vidales et al., 2009), and our own surveys in Prince William show that Hispanics became less satisfied with PWCPD after the policy's initiation.

In addition, anecdotal accounts from our interviews with residents, police, and other County officials indicate that social life and routine activities became more subdued in the Hispanic community after the policy. Some restaurants, night clubs, and entertainment spots, for example, closed or had fewer patrons. Some neighborhoods became quieter with less active street life. After the announcement of the policy, these sorts of places may have drawn fewer people of all sorts—native residents and visitors as well as legal and illegal immigrants. Consequently, there may have been fewer places and social situations that

31. More generally, national surveys also show that Hispanic victims of violence report their victimizations to police at the same rates as do non-Hispanics (e.g., see Truman, 2011; also see review in Rennison, 2010), although reporting by Hispanic victims may be less in certain contexts such as when the victim is an unmarried male who was not injured (Rennison, 2010). However, it remains to be seen how these patterns may change, in general and in different segments of the Hispanic community, in response to local, state, and national policy changes regarding immigration enforcement.

32. The decline in aggravated assaults did not extend to simple assaults, which suggests that people were less deterred from committing and reporting these particular offenses. Perpetrators and victims may have felt that arrests or extensive police investigations were less likely in these cases. PWCPD arrest data also show that illegal immigrants are more heavily involved in aggravated assaults than in simple assaults; in 2009, illegal immigrants accounted for 9% of arrestees for aggravated assaults and for 3% of those for simple assault (PWCPD, 2010: 16–17).

created conditions conducive to assaultive behavior (such as crowds of people drinking in nightclubs).[33]

Finally, we note that although our analysis focused on broader and more serious categories of crime and disorder, it is possible that the policy affected other problematic behaviors not examined in the study. As an illustration, illegal immigrants declined as a percentage of people arrested for operating a vehicle without a license, from 14% in 2008 to 10% in 2009, according to PWCPD reports (PWCPD, 2009: 16, 2010: 17). PWCPD figures also show that more serious hit-and-run accidents (those involving property damage greater than $1,000 or personal injury) followed a pattern similar to that of aggravated assaults, climbing from 287 per year in 2004 and 2005 to 347 in 2006, before falling sharply to 245 in 2007 (a 29% drop) and 182 in 2008 (another 26% drop). This offense is believed by police to be one that involves a higher share of illegal immigrants,[34] and it is difficult to attribute fully the drop in these accidents to causes other than the immigration policy (total accidents also declined during this time but by more modest margins of 17% in 2007 and 7% in 2008, and it seems unlikely that the changes in hit-and-run accidents would be a result of reporting effects). Although we have not assessed these trends formally, they serve as a caveat that the policy may have had effects not examined here.

Implications for Research and Policy

On balance, our conclusions about the policy's impact must be cautious given the lack of historical data on crimes committed by illegal immigrants and other methodological limitations we have noted. Furthermore, generalizations from this research to other jurisdictions should be made cautiously in light of important contextual circumstances in Prince William County, notably, the economic changes in the County and the change in the initial immigration policy, which may have mediated the policy's effects and have less applicability to other

33. The decline in assaults also raises some question as to whether the policy suppressed gang-related assaults involving illegal immigrants in particular. Although evidence discussed previously suggests that immigrants are generally less involved in criminality than native residents, some research also has suggested that gang activity is a significant problem in many Hispanic communities. National estimates from law enforcement agencies suggest, for example, that roughly half of gang members were Hispanic as of the early 2000s (Egley, Howell, and Major, 2006), and national victimization statistics show that Hispanic crime victims are more likely than non-Hispanic victims to report that they were victimized by gang members (Harrell, 2005). In Prince William County, members of PWCPD's gang unit noted in interviews that the nightclubs where gang members often socialized (and got into fights) became much less active after the policy. However, estimates provided by the gang unit indicate that gang-related assaults accounted for only 4% to 11% of aggravated assaults between 2004 and 2006 (and only 4% in 2006). Furthermore, informal estimates from PWCPD personnel suggest that only a minority of the County's gang members are illegal immigrants. Hence, suppression of gang-related assaults involving illegal immigrants may have played some role in the County's decline in aggravated assaults, but it does not seem to have been a predominate factor.

34. Data on arrests of illegal immigrants for hit-and-run accidents are only available for 2009, during which they accounted for 9.4% of these arrestees (PWCPD, 2010: 17).

jurisdictions. That said, the study presents a dilemma regarding approaches to immigration enforcement. On the one hand, the initial version of the Prince William policy, which required police to check the immigration status of any detainees whom they had probable cause to believe were in the country illegally, may have helped to reduce serious assaults in the community—indeed, its mere announcement seems to have had this effect. However, that version of the policy also created a clear rift between police and the immigrant community, and it may have had other adverse long-term consequences had it remained in place (e.g., it may have created significant burdens and costs for PWCPD or have led to racial profiling lawsuits). On the other hand, the current version of the policy, which mandates immigration checks only for arrestees, is less controversial to many (although certainly not all), as evidenced by the gradual improvement in how the immigrant community viewed police in Prince William. Yet this version of the policy has not produced clear effects on crime.

Hence, a key challenge for policy makers and police in Prince William County and elsewhere is finding approaches that effectively balance enforcement and police relations with immigrant communities. One strategy, for example, might be to limit immigration checks to arrestees to avoid legitimacy problems in the immigrant community while supplementing this approach with problem-solving strategies focused on specific issues related to illegal immigrants and crime (e.g., serious assaults, gang issues, public drunkenness, or DUI). Community outreach efforts like those undertaken by PWCPD's leadership also will likely be critical to balancing these concerns. Clearly, there is a need for further evaluation research in other jurisdictions to determine whether the findings from Prince William can be generalized to other locations and to accumulate evidence on optimal policies and practices that reduce crime by illegal immigrants while maintaining and strengthening police legitimacy in the immigrant community generally.

Another issue for further research concerns how a jurisdiction's immigration enforcement operations affect, and are affected by, other criminal justice actors, including corrections agencies, the judiciary, and ICE. The policies of ICE, in particular, are likely to have an important mediating effect on the outcomes associated with local immigration enforcement. We could not gather information on ICE processing of illegal immigrants arrested in Prince William County (nor could Prince William County officials), but perhaps this information can be captured in future studies. Widespread implementation of policies such as Prince William's would put substantial strain on ICE's resources and have important ramifications for ICE policies and operations. Indeed, interviews with ICE officials in the DC area suggested that cooperating with Prince William's policy was challenging for the agency in several respects and would be difficult to accommodate in more agencies (Guterbock et al., 2010). Furthermore, as noted earlier, concerns about the net widening effects of the 287(g) program and other efforts nationwide have led to recent policy changes designed to focus ICE's efforts on more serious criminal offenders and repeat immigration violators (Rodriguez et al., 2010).

Finally, further study also is needed of offending, victimization, and reporting of crime among illegal immigrants. With more police agencies and jails around the country running immigration checks, it should be possible to gather more extensive data on offending by illegal immigrants. However, researchers will need to complement these data with other approaches including ethnographic, qualitative studies and more extensive survey research in immigrant communities.

As further knowledge accumulates about the nexus among illegal immigration, crime, and immigration enforcement, policy makers will be better able to weigh this information against various other considerations involved in the wider debate over immigration policy. A better understanding of these issues will be especially critical to local police, who, in light of both demographic and political trends, are likely to be drawn more heavily into immigration enforcement in coming years.

Acknowledgments

This study was supported by funding from the Prince William County, VA Police Department to the University of Virginia and the Police Executive Research Forum. We thank the department for its support throughout the project. We especially thank former Chief Charlie T. Deane, current Chief Steve Hudson, Mr. Tom Pulaski, Deputy Chief Barry Barnard, Officer William Anzenberger, former Assistant Chief Ray Colgan, and Mr. Tim McCormack for providing data, commenting on drafts of our report, and/or helping us coordinate various aspects of the project. We also thank Major Amanda Lambert and Carole Moye of the Adult Detention Center of Prince William County for providing data and insights on the Center's immigration enforcement activities. We extend our appreciation as well to the many other members of the Prince William County Police Department and Adult Detention Center who took part in interviews, focus groups, and surveys for the project. Our draft reports also benefitted from helpful feedback from other Prince William County officials, including County Executive Melissa Peacor, Deputy County Executives Susan Roltsch and Chris Martino, County Attorney Angela Horan, Public Information Officer Jason Grant, and others. Research and administrative assistance also was provided by numerous current and former staff of the University of Virginia and the Police Executive Research Forum, including Dr. Abdoulaye Diop, Kathleen Baker, Katherine Asbury, Claire Terni, Elizabeth Kaknes, J. Clayton Ford, Ila Crawford, Bruce Kubu, Nathan Ballard, Anthony Bellero, Brandon Gustafson, and Mary Martinez. The views expressed here are those of the authors and do not necessarily represent those of Prince William County's elected leaders, the County's Executive Management, the Prince William County Police Department, or any of the other aforementioned organizations or individuals.

References

Akins, Scott, Ruben G. Rumbaut, and Richard Stansfield. 2009. Immigration, economic disadvantage, and homicide: A community-level analysis of Austin, Texas. *Homicide Studies*, 13: 307–314.

Armenta, Amada. 2012. From sheriff's deputies to immigration officers: Immigration status in a Tennessee jail. *Law & Policy*, 34: 191–210.

Brubaker, Bill. 2008a. Loudoun to check residency in arrests. *The Washington Post*. June 18.

Brubaker, Bill. 2008b. Loudoun policy on illegal immigrants questioned. *The Washington Post*. June 26.

Bui, Hoan N. and Ornuma Thingniramol. 2005. Immigration and self-reported delinquency: The interplay of immigrant generations, gender, race, and ethnicity. *Journal of Crime and Justice*, 28: 79–100.

Butcher, Kristin F. and Anne M. Piehl. 1998a. Recent immigrants: Unexpected implications for crime and incarceration. *Industrial and Labor Relations Review*, 51: 654–679.

Butcher, Kristin F. and Anne M. Piehl. 1998b. Cross-city evidence on the relationship between immigration and crime. *Journal of Policy Analysis and Management*, 17: 457–493.

Butcher, Kristin F. and Anne M. Piehl. 2007. Why are immigrants' incarceration rates so low? Evidence on selective immigration, deterrence, and deportation. Working paper 13229. Cambridge, MA: National Bureau of Economic Research.

Coleman, Mathew. 2012. The "local" migration state: The site-specific devolution of immigration enforcement in the U.S. south. *Law & Policy*, 34: 159–190.

Davidson, Russell and James G. MacKinnon. 1993. *Estimation and Inference in Econometrics*. New York: Oxford University Press.

Decker, Scott H., Peter G. Lewis, Doris M. Provine, and Monica W. Varsanyi. 2009. Immigration and local policing: Results from a national survey of law enforcement executives. In (Mary Malina, ed.), *The Role of Local Police: Striking a Balance Between Immigration Enforcement and Civil Liberties*. Washington, DC: Police Foundation.

Egley, Jr., Arlen, James C. Howell, and Aline K. Major. 2006. *National Youth Gang Survey: 1999–2001*. Washington, DC: Office of Juvenile Justice and Delinquency Prevention, U.S. Department of Justice.

Elder, John and Peter E. Kennedy. 2001. Testing for unit roots: What should students be taught? *Journal of Economic Education*, 32: 137–146.

Federal Bureau of Investigation. 2008. *Crime in the United States, 2007*. U.S. Department of Justice. Retrieved from fbi.gov/ucr/cius2007.

Grieco, Elizabeth M., Yesenia D. Acosta, G. Patricia de la Cruz, Christine Gambino, Thomas Gryn, Luke J. Larsen, Edward N. Trevelyan, and Nathan P. Walters. 2012. *The Foreign-born Population in the United States: 2010*. Washington, DC: U.S. Census Bureau, U.S. Department of Commerce.

Guterbock, Thomas M., Christopher S. Koper, Milton Vickerman, Bruce Taylor, Karen E. Walker, and Timothy Carter. 2010. *Evaluation Study of Prince William County's Illegal Immigration Enforcement Policy*. Final report 2010 to the Prince William County, VA

Police Department. Center for Survey Research, University of Virginia and Police Executive Research Forum.

Hagan, John and Alberto Palloni. 1998. Immigration and crime in the United States. In (James P. Smith and Barry Edmonston, eds.), *The Immigration Debate: Studies on the Economic, Demographic, and Fiscal Effects of Immigration*. Washington, DC: National Academies Press.

Harrell, Erika. 2005. *Violence by Gang Members, 1993–2003*. Washington, DC: Bureau of Justice Statistics, U.S. Department of Justice.

Hoefer, Michael, Nancy Rytina, and Bryan C. Baker. 2011. *Estimates of the Unauthorized Immigrant Population Residing in the United States: January 2010*. Washington, DC: Office of Immigration Statistics, U.S. Department of Homeland Security.

Immigration and Customs Enforcement. 2012a. *Fact Sheet: Delegation of Immigration Authority Section 287(g) Immigration and Nationality Act*. U.S. Department of Homeland Security. Retrieved June 23, 2012 from ice.gov.

Immigration and Customs Enforcement. 2012b. *Activated Jurisdictions*. U.S. Department of Homeland Security. Retrieved June 23, 2012 from ice.gov.

Immigration and Customs Enforcement. 2012c. *Fact Sheet: Criminal Alien Program*. U.S. Department of Homeland Security. Retrieved February 27, 2013 from ice.gov/news/library/factsheets/cap.htm.

Immigration and Customs Enforcement. 2012d. *Removal Statistics*. U.S. Department of Homeland Security. Retrieved June 23, 2012 from ice.gov/removal-statistics.

International Association of Chiefs of Police. 2007. *Police Chiefs Guide to Immigration Issues*. Alexandria, VA: Author.

Klinger, David A. and George S. Bridges. 1997. Measurement error in calls-for-service as an indicator of crime. *Criminology*, 35: 705–726.

Lee, Matthew T., Ramiro Martinez, Jr., and Richard Rosenfeld. 2001. Does immigration increase homicide? Negative evidence from three border cities. *The Sociological Quarterly*, 42: 559–580.

Lilley, David and Rachel Boba. 2009. Crime reduction outcomes associated with the State Criminal Alien Assistance Program. *Journal of Criminal Justice*, 37: 217–224.

MacDonald, John M., John R. Hipp, and Charlotte Gill. 2012. The effects of immigrant concentration on changes in neighborhood crime rates. *Journal of Quantitative Criminology*, doi: 10.1007/s10940-012-9176-8.

Major City Chiefs. 2006. MCC immigration committee recommendations for enforcement of immigration laws by local police agencies. Retrieved February 27, 2013 from majorcitieschiefs.com/pdf/MCC_Position_Statement.pdf.

Martinez, Jr., Ramiro and Matthew T. Lee. 2000. On immigration and crime. In (Gary LaFree, Robert J. Bursik, James Short, and Ralph B. Taylor, eds.), *The Nature of Crime: Continuity and Change. Criminal Justice 2000, Vol. 1*. Washington, DC: National Institute of Justice, U.S. Department of Justice.

Martinez, Jr., Ramiro, Jacob I. Stowell, and Matthew T. Lee. 2010. Immigration and crime in an era of transformation: A longitudinal analysis of homicides in San Diego neighborhoods, 1980–2000. *Criminology*, 48: 797–829.

McCleary, Richard and Richard A. Hay, Jr. 1980. *Applied Time Series Analysis for the Social Sciences*. Beverly Hills, CA: Sage.

McDowall, David, Colin Loftin, and Brian Wiersema. 1996. Using quasi-experiments to evaluate firearms laws: Comment on Britt et al.'s reassessment of the DC gun law. *Law & Society Review*, 30: 381–391.

National Conference of State Legislators. 2012a. State laws related to immigration and immigrants. Retrieved June 21, 2012 from ncsl.org/issues-research/immig/state-laws-related-to-immigration-and-immigrants.aspx.

National Conference of State Legislators. 2012b. State omnibus immigration legislation and legal challenges. Retrieved February 15, 2013 from ncsl.org/issues-research/immig/omnibus-immigration-legislation.aspx.

National Research Council. 2004. *Fairness and Effectiveness in Policing: The Evidence*. Washington, DC: The National Academies Press.

Newton, Lina. 2012. Policy innovation or vertical integration? A view of immigration federalism from the states. *Law & Policy*, 34: 113–137.

O'Neil, Kevin. 2010. Hazelton and beyond: Why communities try to restrict immigration. Migration Policy Institute. Retrieved June 22, 2012 from migrationinformation.org/Feature/display.cfm?ID=805.

Ousey, Graham and Charis E. Kubrin. 2009. Exploring the connection between immigration and violent crime rates in U.S. cities, 1980–2000. *Social Problems*, 56: 447–473.

Passel, Jeffrey S. 2006. *The Size and Characteristics of the Unauthorized Migrant Population in the U.S.* Washington, DC: Pew Hispanic Center, Pew Research Center.

Passel, Jeffrey, D'Vera Cohn, and Ana Gonzalez-Barrera. 2012. *Net Migration from Mexico Falls to Zero—and Perhaps Less*. Washington, DC: Pew Hispanic Center, Pew Research Center.

Pew Hispanic Center. 2007. *2007 National Survey of Latinos: As Illegal Immigration Issue Heats Up, Hispanics Feel a Chill*. Washington, DC: Pew Research Center.

Police Executive Research Forum. 2008. *Police Chiefs and Sheriffs Speak Out on Local Immigration Enforcement*. Washington, DC: Author.

Police Foundation. 2009. *The Role of Local Police: Striking a Balance Between Immigration Enforcement and Civil Liberties* (Mary Malina, ed.). Washington, DC: Author.

Prince William County Police Department. 2009. *2008 Crime Statistics*.

Prince William County Police Department. 2010. *2009 Crime Statistics*.

Rand, Michael R. 2009. *Criminal Victimization, 2008*. Washington, DC: Bureau of Justice Statistics, U.S. Department of Justice.

Rennison, Callie M. 2010. An investigation of reporting violence to the police: A focus on Hispanic victims. *Journal of Criminal Justice*, 38: 390–399.

Roberts, Aki. 2008. The influences of incident and contextual characteristics on crime clearance of non-lethal violence: A multi-level event history analysis. *Journal of Criminal Justice*, 36: 61–71.

Rodriguez, Cristina, Muzaffar Chishti, Randy Capps, and Laura St. John. 2010. *A Program in Flux: New Priorities and Challenges for 287(g)*. Washington, DC: Migration Policy Institute.

Rumbaut, Ruben G. 2009. Undocumented immigration and rates of crime and imprisonment: Popular myths and empirical realities. In (Mary Malina, ed.), *The Role of Local Police: Striking a Balance Between Immigration Enforcement and Civil Liberties*. Washington, DC: Police Foundation.

Sampson, Robert J. 2008. Rethinking crime and immigration. *Contexts*, 7: 28–33.

Sampson, Robert J., Jeffrey D. Morenoff, and Stephen Raudenbush. 2005. Social anatomy of racial and ethnic disparities in violence. *American Journal of Public Health*, 95: 224–232.

Schriro, Dora. 2009. Immigration detention overview and recommendations. Immigration and Customs Enforcement, U.S. Department of Homeland Security. Retrieved from ice.gov/doclib/about/offices/odpp/pdf/ice-detention-rpt.pdf.

Shaw, Clifford R. and Henry D. McKay. 1942. *Juvenile Delinquency and Urban Areas*. Chicago, IL: University of Chicago Press.

Sherman, Lawrence W., Patrick R. Gartin, and Michael E. Buerger. 1989. Hot spots of predatory crime: Routine activities and the criminology of place. *Criminology*, 27: 27–55.

Singer, Audrey, Jill H. Wilson, and Brooke DeRenzis. 2009. *Immigrants, Politics, and Local Response in Suburban Washington*. Washington, DC: Metropolitan Policy Program, Brookings Institution.

Tonry, Michael. 1997. Ethnicity, crime, and immigration. In (Michael Tonry, ed.), *Crime and Justice, Ethnicity, Crime and Immigration: Comparative and Cross-National Perspectives*, Vol. 21. Chicago, IL: University of Chicago Press.

Truman, Jennifer L. 2011. *Criminal Victimization, 2010*. Washington, DC: Bureau of Justice Statistics, U.S. Department of Justice.

U.S. Census Bureau. 1999. Nativity of the population and place of birth of the native population: 1850 to 1990. Revised 2011. U.S. Department of Commerce. Retrieved June 23, 2012 from census.gov/population/www/documentation/twps0029/tab01.html.

U.S. Government Accountability Office. 2009. *Immigration Enforcement: Better Controls Needed Over Program Authorizing State and Local Enforcement of Federal Immigration Law*. Washington, DC: Author.

U.S. Government Accountability Office. 2011. *Criminal Alien Statistics: Information on Incarcerations, Arrests, Costs*. Washington, DC: Author.

Varsanyi, Monica W., Paul G. Lewis, Doris M. Provine, and Scott Decker. 2012. A multilayered jurisdictional patchwork: Immigration federalism in the United States. *Law & Policy*, 34: 138–158.

Vidales, Guadalupe, Kristen M. Day, and Michael Powe. 2009. Police and immigration enforcement: Impacts on Latino(a) residents' perceptions of police. *Policing: An International Journal of Police Strategies and Management*, 32: 631–653.

Wadsworth, Tim. 2010. Is immigration responsible for the crime drop? An assessment of the influence of immigration on changes in violent crime between 1990 and 2000. *Social Science Quarterly*, 91:531–553.

Warner, Barbara D. and Glenn L. Pierce. 1993. Reexamining social disorganization theory using calls to the police as a measure of crime. *Criminology*, 31: 493–517.

Court Case Cited

Arizona et al. v. United States, 11–182 (2012).

APPENDIX

TABLE A1

Descriptive Statistics for Weekly Calls for Police Service in Prince William County, 2000–2009, Before and After July 2007

Pre–Post Jul-07		Person	Property	Disorder	Drug	DUI
Pre	Mean	272.24	320.91	333.56	24.17	16.83
	N	388	388	388	388	388
	SD	28.868	42.613	81.431	6.974	6.034
Post	Mean	249.82	316.98	414.88	26.04	29.08
	N	130	130	130	130	130
	SD	27.555	34.619	73.547	6.583	8.343
Total	Mean	266.62	319.92	353.97	24.64	19.91
	N	518	518	518	518	518
	SD	30.132	40.758	86.941	6.919	8.538

TABLE A2

Descriptive Statistics for Weekly Calls for Service in Prince William County, 2000–2009, Before and After March 2008

Pre–Post Mar-08		Person	Property	Disorder	Drug	DUI
Pre	Mean	270.51	320.79	336.97	24.17	17.39
	N	423	423	423	423	423
	SD	29.562	42.030	81.051	6.927	6.270
Post	Mean	249.27	316.07	429.64	26.74	31.12
	N	95	95	95	95	95
	SD	26.422	34.467	70.667	6.517	8.305
Total	Mean	266.62	319.92	353.97	24.64	19.91
	N	518	518	518	518	518
	SD	30.132	40.758	86.941	6.919	8.538

TABLE A3

Descriptive Statistics for Weekly Offense Reports in Prince William County, 2003–2009, Before and After July 2007

Pre–Post Jul-07		Part 1 Violence	Part 1 Property	Aggravated Assault	Robbery	Simple Assault
Pre	Mean	18.11	147.70	8.29	4.69	41.52
	N	235	235	235	235	235
	SD	4.85	20.82	3.39	2.65	8.00
Post	Mean	16.53	149.98	6.15	5.13	48.14
	N	130	130	130	130	130
	SD	4.90	20.93	2.83	2.59	9.13
Total	Mean	17.55	148.51	7.53	4.85	43.88
	N	365	365	365	365	365
	SD	4.92	20.86	3.36	2.63	8.99

TABLE A4

Descriptive Statistics for Weekly Offense Reports in Prince William County, 2003–2009, Before and After March 2008

Mar-08		Part 1 Violence	Part1 Property	Aggravated Assault	Robbery	Simple Assault
Pre	Mean	17.99	147.62	8.14	4.76	42.10
	N	270	270	270	270	270
	SD	4.87	20.43	3.41	2.59	8.12
Post	Mean	16.32	151.04	5.78	5.11	48.93
	N	95	95	95	95	95
	SD	4.89	21.96	2.51	2.75	9.45
Total	Mean	17.55	148.51	7.53	4.85	43.88
	N	365	365	365	365	365
	SD	4.92	20.86	3.36	2.63	8.99

TABLE B

Selected Characteristics of Prince William County and Comparison Jurisdictions

Jurisdiction(s)	Population in 2006	% Foreign-Born in 2006	% Change in Foreign-Born, 2000–2006	Average Violent Crime Rate per 100,000, 2005–2006	Average Property Crime Rate per 100,000, 2005–2006
Prince William County	357,503	22%	144%	202	2,109
Other Virginia Jurisdictions					
Alexandria City	136,974	23%	—2%	341	2,446
Arlington County	199,776	23%	—12%	202	2,094
Fairfax County	1,010,443	27%	14%	74	1,523
Loudoun County	268,817	21%	195%	66	1,120
Spotsylvania County	119,529	6%	145%	165	1,574
Maryland Jurisdictions					
Prince George's County	841,315	19%	44%	1,059	5,840
Montgomery County	932,131	29%	17%	242	2,526
Frederick County	222,938	9%	150%	338	1,702
Charles County	140,416	4%	47%	539	3,092

Notes. Population data were taken from the U.S. Census Bureau's 2000 Census Survey and 2006 American Communities Survey. (Most of these figures are reported in Singer et al., 2009.) The crime figures include the Uniform Crime Reports Part I categories of violent crime (murder, rape, robbery, and aggravated assault) and property crime (burglary, larceny, and auto theft). Further details about the crime data are provided in the text.

Christopher S. Koper is an associate professor in the Department of Criminology, Law and Society at George Mason University and a senior fellow in George Mason's Center for Evidence-Based Crime Policy. Professor Koper holds a Ph.D. in criminology and criminal justice from the University of Maryland and has worked for organizations including the Police Executive Research Forum, the University of Pennsylvania, the Urban Institute, the RAND Corporation, and the Police Foundation. He has directed or co-directed numerous studies for the U.S. Department of Justice and other funding agencies, and he has written and published extensively on issues related to firearms, policing, federal crime prevention efforts, research methods, and other topics.

Thomas M. Guterbock is the director of the Center for Survey Research (CSR), a professor of sociology, and an associate professor for research in health evaluation sciences at the University of Virginia. Educated at Yale and the University of Chicago (Ph.D., sociology, 1976), Professor Guterbock is the author of numerous publications in political sociology, urban sociology, the sociology of community, and research methods. From 1983 to 1985, he managed the sociology program of the National Science Foundation. In his role as founding director of CSR, he has been involved in scores of survey projects for state and

local government agencies, academic and health researchers with federal or foundation grants, nonprofits, and some private-sector clients.

Daniel J. Woods is a research associate at the Police Executive Research Forum (PERF). While at PERF, he has worked on survey construction, data management, and analysis in different areas of law enforcement. Prior to joining PERF, he worked as a research specialist with the Jerry Lee Center of Criminology at the University of Pennsylvania. He was primarily responsible for analyzing data from the Reintegrative Shaming Experiments (RISE), conducted in Canberra, Australia. He received an M.A. in criminology and criminal justice from the University of Maryland and his PhD. in criminology from the University of Pennsylvania. He has written or co-authored numerous reports and publications on restorative justice, policing, community crime prevention, and other topics.

Bruce Taylor is a senior fellow for NORC at the University of Chicago. He has conducted studies in policing, school violence prevention, treatment for violent offenders, victimization, dynamics of drug markets, and hardcore drug use. His current research includes randomized experiments on school violence prevention, measuring the prevalence and risk factors for teen dating violence, conducting a national survey on services for crime victims, and studying ways to improve police and correctional officer health and safety. He has published numerous peer-reviewed publications, government reports, and guidebooks and has led more than 50 government and privately funded studies. He received his Ph.D. from Rutgers University in 1996 and is a fellow in the Academy of Experimental Criminology of the American Society of Criminology.

Timothy J. Carter is a professor of sociology and the department head of sociology and anthropology at James Madison University. He received his Ph.D. from the University of Tennessee. Professor Carter has written numerous publications on a variety of topics including rural crime, crime victimization, juvenile court sentencing, class inequality and crime, critical theories of crime, adolescent drug use, declining economies and crime, corporate crime, arrest decisions, and use of force by and assaults on game wardens. These publications, among others, are widely cited in leading journals and texts in sociology, criminology, juvenile delinquency, and criminal justice.

The Need for *Social Policies* that Support the Revitalizing Effects of Immigration Rather than *Law Enforcement* Initiatives that Assume Disproportionate Immigrant Criminality

Matthew T. Lee
University of Akron

A decade ago, I ended my book (Lee, 2003: 133) on the relationship between immigration and crime with a quote suggesting that we would be well served by "finding ways to preserve, protect, and promote the social capital that . . . immigrants bring to their experience in the United States, rather than overemphasize issues of crime and punishment" (Hagan and Palloni, 1998: 382). At that time, few empirical studies had been conducted on the post-1965 immigration/crime nexus. Since then, research on this issue has exploded. Based on this accumulated knowledge, I remain more convinced than ever that Hagan and Palloni had it right when they argued that a focus on crime is a distraction from the more important policy question of how to support the substantial social capital that immigrants bring to this country. Immigrants have breathed new life into many areas where they have settled and often (not always) have reduced crime rates as an added bonus. A recent article summed up the extant literature on this issue, noting that, "The predominant explanation as to why immigrant concentration reduces neighborhood violence is known as the 'immigrant revitalization perspective'" (Lyons, Vélez, and Santoro, 2013: 3; see also Feldmeyer, 2009; Lee, 2003; Lee and Martinez, 2009; Lee, Martinez, and Rosenfeld, 2001; Sampson, 2008).

When Ramiro Martinez, Jr. and I first started using this term (see Lee and Martinez, 2002) to describe the process by which immigration might reduce social disorganization and decrease crime, it was not clear whether our initial findings would be widely replicated. In various other papers, we have referred to the immigration revitalization perspective as the "emerging" scholarly consensus (Lee and Martinez, 2009). On balance, the revitalization

Direct correspondence to Matthew T. Lee, Department of Sociology, University of Akron, Akron, OH 44325-1905 (e-mail: mlee2@uakron.edu).

DOI:10.1111/1745-9133.12033

thesis has held up well after more than a decade of additional research. Perhaps Lyons et al. (2013: 3) were correct, and it is time to say that this perspective has moved out of the emergent phase and has become the "predominant" view among scholars. If so, then policy makers would be well served by becoming familiar with this line of research. Importantly, in addition to decreasing crime among immigrants, immigration has been found to reduce crime among nonimmigrant groups as well (Sampson, 2008). The revitalizing effects of immigration extend beyond immigrant communities and beyond crime (see Lee, 2003: 27).

In light of this, we might wonder why policy makers would make immigrants the target for additional law enforcement in the first place. Rumbaut and Ewing (2007: 3) offered the following answer: "[The] misperception that the foreign-born, especially illegal, immigrants are responsible for higher crime rates is deeply rooted in American public opinion and is sustained by media anecdote and popular myth." This statement is not to suggest that immigrants do not commit crime or that specific enforcement efforts directed at immigrants never make sense. But I was not at all surprised to learn in the article by Koper, Guterbock, Woods, Taylor, and Carter (2013, this issue) that residents in Prince William County, VA (PWC), feared "rising street crime" during a period of rapid immigration to the area, even though "the crime rate in the County was actually decreasing" (Koper et al., 2013). The myth of the criminal immigrant probably played a role in PWC's policy change, but residents also were concerned about "unkempt homes and lawns, signs of overcrowded housing, noise levels," and so on (Koper et al., 2013). Did the concerned residents of PWC follow Hagan and Palloni's (1998) advice and demand new social policies that might support immigrants, build on their strengths, help them thrive in ways that benefit immigrants and nonimmigrants alike, and ameliorate these *noncriminal* community concerns? No. Instead, "political activist groups . . . pressured County officials to crack down on illegal immigrants" (Koper et al., 2013) by requiring County police to enter into a 287(g) agreement with federal Immigration and Customs Enforcement and check the immigration status of those they detained, even in traffic stops. The local jail followed suit and ran its own immigration checks on detainees.

Some "leading law enforcement associations, practitioners, and scholars" (Koper et al., 2013) find little value in such crackdowns and question the utility of using local police in immigration enforcement. As Koper et al. state, the costs of such measures include creating distrust in the police in immigrant communities, discouraging crime reporting, increasing vulnerability to some kinds of victimization, and a host of other effects that may actually increase crime rather than decrease it. Nevertheless, PWC forged ahead with its plan. The results showed no effect on most forms of crime, although a decrease in aggravated assaults was observed. Unfortunately, the new policy "also seemed to harm police relations with the immigrant community" (Koper et al., 2013), leading Koper et al. to make the reasonable suggestion that local communities should focus their enforcement efforts on *actual criminal violators* rather than on an entire group of people, most of whom are not engaged in crime.

Did we really need an empirical study to help us reach that rather obvious conclusion? Sadly, we did. And we will probably need additional research to help policy makers and residents in places like PWC understand that their short-sighted *law enforcement* approach to perceived problems associated with immigration will need to be replaced by *social policies* that support and expand the revitalizing potential of immigrant communities. Targeting immigrants for additional legal scrutiny is popular with the public in many jurisdictions. This view represents a kind of *racial degradation ceremony*: "symbolic, racially motivated collective acts that reassert notions of white superiority" for the purpose of excluding the degraded group from community resources (Longazel, 2012: 99). Studies like the one by Koper et al. (2013), combined with the growing body of research on immigration and crime more generally, are important for debunking myths and developing more realistic and effective approaches to solving community problems.

The Immigration Revitalization Process: How Might Social Policies Enhance Its Effect?

Immigrants and immigration have a long history of serving as scapegoats for a range of social problems. Politicians and pundits have pursued this strategy with renewed vigor in recent years partly because this helps to deflect attention from systemic problems and focus attention on less politically powerful groups. Yet the inflammatory rhetoric about immigrants and crime is increasingly out of step with scholarship that has concluded that "immigration is not a major cause of crime in the United States" and that "we can learn a great deal by understanding the many ways in which immigration prevents crime" (Lee and Martinez, 2009: 15). In addition to reducing crime, scholars have demonstrated that immigration is associated with a variety of positive results, including economic revitalization and better-than-expected health outcomes (Lee, 2003).

I am grateful to Koper et al. (2013) for their thoughtful and informative article. Of course, they said much more than the single, somewhat simplified, conclusion that I mentioned. But policy makers may be mostly interested in the main point that the law enforcement approach did not seem to affect most forms of crime, although it did harm immigrant/police relations. Social scientists will undoubtedly pay more attention to the details of the research, and they will benefit from a close reading of the article, as it is a fine example of a methodologically sophisticated attempt to understand the impact of a new law enforcement policy. Although it is only one study focused on a single county at one point in time, and we must be careful about generalizing beyond this case, I believe that the results are informative indeed when coupled with what we are learning from the broader research on the immigration/crime nexus. In short, if immigration is not a cause of crime, then law enforcement efforts that target immigrants will probably not be effective at reducing crime. The question then arises, how might social policy enhance the revitalizing effects of immigration in communities?

To understand more clearly the essential role that social policies, rather than law enforcement strategies, play in shaping the relationship between immigration and crime, policy makers and scholars would both benefit from considering the findings from a groundbreaking study that has built on the immigration revitalization perspective by integrating minority incorporation and political process theories (Lyons et al., 2013). Drawing on data from nearly 9,000 census tracts in 87 U.S. cities, Lyons et al. explored the effects of city-level measures of immigrant political opportunities, including pro-immigrant legislation and the extent of minority political incorporation. Lyons et al. found that the negative relationship between immigration and crime at the neighborhood level was enhanced when the city context favored these immigrant political opportunities.

This finding underscores the point that neighborhoods and communities are not "islands unto themselves" and that "the fate of neighborhoods . . . partly depends on the receptivity of local political actors and structures to their needs" (Lyons et. al, 2013: 2). Lyons et al. (2013) referred to a "spiral of trust" in cities with favorable immigrant political opportunities that mitigates social isolation/disorganization and strengthens relationships between immigrants and other residents, as well as public officials. Especially relevant to the study by Koper et al. (2013), Lyons and colleagues found that the crime-reducing benefits of immigration concentration were strongest in cities that limited the "local enforcement of federal immigration laws" (Lyons et al., 2013: 14). They concluded that the revitalizing effects of immigration are most pronounced in cities that are more receptive to the needs and demands of immigrants, not in the cities that involved local police in federal immigration enforcement. One is reminded of Hagan and Palloni's (1998) prescient suggestion that we should find ways to support the social capital of immigrants instead of dwelling on crime and punishment.

Conclusion

Do law enforcement efforts targeted at immigrants reduce crime? An examination of the recent research (Koper et al., 2013; Lyons et. al., 2013), when placed in the context of research on immigration and crime conducted over the past decade, has suggested that the answer will generally be "no." Koper et al. conclude that a new law enforcement policy involving checking immigration status did not seem to affect "most forms of crime," although it was associated with a decrease in aggravated assaults in one county in Virginia. Koper et al. are rightfully cautious about making too much of the decline in this single form of crime. After all, they point out that the rates of aggravated assault declined in surrounding communities. For example, Alexandria did not adopt the immigration enforcement policy implemented by PWC, and yet a nearly identical decrease in aggravated assaults was observed there. Meanwhile, Loudoun experienced a 76% increase in this form of violent crime, despite adopting a policy similar to PWC.

As Klinger (2012: 638) pointed out, there is a temptation to "reach conclusions without comprehensively considering the threats to the validity of said conclusions posed by factors

that have not been adequately accounted for in the analysis." Koper et al.'s (2013) study is limited by an inability to measure "third factors" that may be a "source of spuriousness" (Klinger, 2012: 638). As I have suggested, immigrant political opportunities may be one such factor that was not measured by Koper et al. (Lyons et al., 2013). Perhaps this variable, or some other factor, will be identified in future research to help us understand the different experiences in PWC, Loudoun, and Alexandria. Koper et al. present mostly quantitative data and do not provide much insight into the historical situation facing the immigrants who settled in PWC, nor do they offer rich, ethnographic accounts of the lived experiences of immigrants, other residents, or legal officials. This is all certainly beyond what can be expected in a study like that by Koper et al. But the broader point remains: Definitive answers will have to await further research that can address these kinds of issues.

Given the contentiousness of policy debates about immigration, the significant gaps in our knowledge (partly caused by our inability to measure third factors), and the significant damage that may be inflicted by wrongheaded policy decisions in this domain, we would be wise to avoid making policy decisions based on a single study. In the meantime, significant costs are associated with continuing to ignore the conclusions of scholars like Hagan and Palloni (1998) and others associated with the immigration revitalization perspective. If we continue to focus our time and resources on legal crackdowns on immigrants rather than on social policies that build on their strengths, then we should not be surprised if results are less than optimal. Lyons et al. (2013: 21) reminded us that:

> The ability of immigrants to revitalize their communities may depend on how attached immigrants feel toward receiving communities. By marginalizing newcomers, creating political cynicism, and instilling mistrust of the police and local authority, hostile regimes may set in motion the very processes they fear.

In other words, we now have an empirically sound foundation for moving beyond the dubious assumption of immigrant pathology and toward a recognition that immigrants, and immigration as a social process, support thriving communities. Instead of being a source of social disorganization, immigration often reinvigorates neighborhoods and cities. Policy makers must fulfill their obligation as community *leaders*, acknowledge this reality, and advocate for positive social policies that extend the benefits of immigration, instead of allowing popular myths to lead them down the counterproductive path of punitive legal intervention.

References

Feldmeyer, Ben. 2009. Immigration and violence: The offsetting effects of immigrant concentration on Latino violence. *Social Science Research*, 38: 717–731.

Hagan, John and Alberto Palloni. 1998. Immigration and crime in the United States. In (James P. Smith and Barry Edmonston, eds.), *The Immigration Debate*. Washington, DC: National Academy Press.

Klinger, David A. 2012. Back to basics: Some thoughts on the importance of organized skepticism in criminology and public policy. *Criminology & Public Policy*, 11: 637–640.

Koper, Christopher S., Thomas M. Guterbock, Daniel J. Woods, Bruce Taylor, and Timothy J. Carter. 2013. The effects of local immigration enforcement on crime and disorder: A case study of Prince William County, Virginia. *Criminology & Public Policy*, 12: 239–276.

Lee, Matthew T. 2003. *Crime on the Border: Immigration and Homicide in Urban Communities*. New York: LFB Scholarly.

Lee, Matthew T. and Ramiro Martinez, Jr. 2002. Social disorganization revisited: Mapping the recent immigration and black homicide relationship in northern Miami. *Sociological Focus*, 35: 363–380.

Lee, Matthew T. and Ramiro Martinez, Jr. 2009. Immigration reduces crime: An emerging scholarly consensus. In (William F. McDonald, ed.), *Immigration, Crime and Justice*. Bingley, U.K.: Emerald.

Lee, Matthew T., Ramiro Martinez, Jr., and Richard Rosenfeld. 2001. Does immigration increase homicide rates? Negative evidence from three border cities. *Sociological Quarterly*, 42: 559–580.

Longazel, Jamie G. 2012. Moral panic as racial degradation ceremony: Racial stratification and the local-level backlash against Latino/a immigrants. *Punishment & Society*, 15: 96–119.

Lyons, Christopher J., María B. Vélez, and Wayne A. Santoro. 2013. Neighborhood immigration, violence, and city-level immigrant political opportunities. *American Sociological Review*, 78: 604–632.

Rumbaut, Ruben G. and Walter A. Ewing. 2007. *The Myth of Immigrant Criminality and the Paradox of Assimilation: Incarceration Rates Among Native and Foreign-Born Men*. Special Report of the Immigration Policy Center. Washington, DC: American Immigration Law Foundation.

Sampson, Robert J. 2008. Rethinking crime and immigration. *Contexts*, 7: 28–33.

Matthew T. Lee is professor and chair of sociology at the University of Akron. His research interests include the relationship between immigration and crime, the effects of religion/spirituality on youth addiction, and social influences on altruism. He is president-elect of the North Central Sociological Association and chair of the Altruism, Morality, and Social Solidarity Section of the American Sociological Association.

When Perception Is Reality

287(g)—A Solution in Search of a Problem

Terry Coonan
Florida State University

Political strategist Lee Atwater famously observed that perception is reality. Nothing perhaps better exemplifies this observation than the ongoing debate in the United States regarding the relationship between crime and illegal immigration. Public perceptions of the issue continue to drive policy decisions, even when little or only deeply contested empirical findings inform such policy decisions. And no public policy seems to embody the divergence between perception and reality more than the 287(g) program that delegates traditional federal immigration enforcement powers to state and local law enforcement actors.

Since its concrete launch in 2002, the 287(g) program has been a wellspring for impassioned criticisms from all sides of the political spectrum. Human rights and immigrant advocacy groups have decried it as a source of racial profiling and post–9-11 xenophobia. Law enforcement agencies have regarded it with ambivalence, wary of the potential it holds for civil rights lawsuits, diminished crime reporting by immigrant communities, and a foisting of federal responsibilities on resource-stretched local agencies. For their part, restrictionist-minded immigration critics are impatient that many legal hurdles continue to frustrate the removal of America's estimated 11–12 million undocumented immigrants.

Much of the debate around illegal immigration and crime in America has generated the proverbial "more heat than light." Conspicuously absent from the debate have been reliable quantitative assessments of the issue, at either local or national levels. A timely—and relevant—exception to this is the study of crime and illegal immigration in Prince William County, VA, conducted by Koper, Guterbock, Woods, Taylor, and Carter (2013, this issue). Assessing the impact of Prince William County's widely followed 2007 decision to join the 287(g) program, Koper et al. offer researchers and policy makers a revealing quantitative analysis of both the intended and unintended consequences that occur when local law

Direct correspondence to Terry Coonan, Center for the Advancement of Human Rights, 426 West Jefferson, Florida State University, 600 W. College Avenue, Tallahassee, FL 32306 (e-mail: tcoonan@admin.fsu.edu).

DOI:10.1111/1745-9133.12036

enforcement takes on federal immigration powers. Even given Koper et al.'s appropriate reticence about overgeneralizing from their findings, their study is one that should inform the future of the 287(g) and illegal immigration debate in the United States.

The Outsourcing of Federal Immigration Enforcement Powers

The 287(g) program has engendered controversy since its inception. It was introduced into U.S. immigration law with the passage of the Illegal Immigration Reform and Immigrant Responsibility Act of 1996. Known as IIRIRA, this immigration reform act found ready support from a U.S. public concerned by mounting illegal immigration levels in the 1990s. IIRIRA created a new section 287(g) in the Immigration and Nationality Act that delegated immigration enforcement powers traditionally reserved for trained federal immigration officials to local and state law enforcement agencies throughout the country. In particular, 287(g) affords local law enforcement agencies with two powers never before granted to nonfederal immigration officials. The first is the authority to issue immigration detainers and hold a foreign national for 48 hours until that person can be transferred into U.S. Immigrations and Customs Enforcement (ICE) custody. The second is the power to charge noncitizens with immigration offenses that may render them deportable (or "removable" in the legal terminology introduced by IIRIRA in 1996).

Agencies willing to take on these additional tasks do so in one of three ways: (a) through a jail model, in which detention officials screen arrestees for immigration status when the noncitizens are booked on criminal (nonimmigration) charges; (b) through a task force model, in which local law enforcement officials screen noncitizens for status when encountered in the community; or (c) through a hybrid model that allows jurisdictions to combine the jail and task force approaches. Whatever the model chosen, specialized training of the local and state law enforcement officials is required and provided by the ICE. Whether such training in U.S. immigration law, in the rights of immigrants, and in the nuances of avoiding racial profiling and other constitutional violations is in fact adequate has been hotly contested by U.S. civil liberty groups and community organizations.

Curiously, the 287(g) program is not identifiable with partisan political fault lines. Enacted during the Clinton administration, it was vigorously embraced by the Bush administration after 9-11, and it was revised but enthusiastically expanded by the Obama administration. Anti-immigrant critics of the Obama administration would in fact do well to recall that Obama has been termed "the deporter-in-chief" by left-leaning immigrant advocacy groups who decry his record of having removed more than 400,000 foreign nationals annually since 2008—more than any president in U.S. history.[1]

1. One commentator noted that the persistent myth that President Obama is systematically tearing down immigration enforcement is belied by Obama's actual record of increasing immigration enforcement and restricting legal immigration (Nowrasteh, 2012).

A Deeply Contested Track Record

Civil liberty groups and immigrant advocates have not been alone in their criticism of the 287(g) program. Notwithstanding the expansion of the program during the Obama years, the U.S. law enforcement community has itself evinced a mixed reaction to it. Some local law enforcement officials have claimed that the additional powers afforded them under the 287(g) have been critical in decreasing crime, and ICE at one point touted the program as "one of the agency's most successful and popular partnerships" (Lin, 2010: para. 5).

But the broader U.S. law enforcement community has been less sanguine. In its 2007 *Police Chiefs Guide to Immigration Issues*, the International Association of Chiefs of Police (IACP) cautioned that determining the difference between legal and illegal status is a complex task that carries with it significant responsibilities. The IACP noted further that effective training for undertaking immigration responsibilities is lengthy and requires an extraordinary commitment of agency resources. Finally, the IACP warned that a failure to train local law enforcement officers adequately would create "significant ramifications, risks, and liability" (IACP, 2007: 14).

For its part, the Police Foundation underscored the risks that local law enforcement incurs when officers assume immigration functions. In a 2009 publication titled *The Role of Local Police: Striking a Balance in Immigration Enforcement and Civil Liberties* (Khashu, 2009), the nonpartisan foundation noted that U.S. police executives have felt torn between a desire to cooperate with federal immigration authorities and the concern that doing so will undermine vital gains they have made with community-oriented policing practices. The foundation observed that most U.S. police chiefs with whom it consulted in its research regard the costs of immigration enforcement by local law enforcement agencies in instances where there is no criminal nexus as far outweighing any potential benefits (Khashu, 2009).

Critics of the 287(g) program have hailed from both sides of the political aisle. In Arizona, the conservative Goldwater Institute published a report (Bolick, 2008) declaring that controversial Maricopa County Sheriff Joe Arpaio had failed the Phoenix community when his highly publicized 287(g) efforts led to law enforcement costs four times the rate of the county's population, while violent crimes had simultaneously increased nearly 70% and homicides increased 166% between 2004 and 2007. Bolick concluded that Arpaio and the 287(g) program had actually made life less safe for the residents of Maricopa County.

A cost–benefit analysis of the 287(g) program results in greatly varied conclusions. Thinkers and policy makers who operate from a "universalist approach"—one that assesses the success of 287(g) employing the criterion of whether it has decreased the overall presence of illegal (undocumented) immigrants in the United States—consider the program an effective and long-overdue law enforcement tool. Vaughan and Edwards (2009) cited it as an initiative that is a force multiplier as well as a cost-effective alternative to much more expensive federal programs such as *Secure Communities* or *Fugitive Operations* that also focus on criminal alien identification. Thinkers in the restrictionist camp perceive 287(g) as

comprising an important element of an "attrition strategy" meant to reduce incrementally the presence of undocumented immigrants in the United States (Vaughan, 2006).

Other policy makers draw diametrically opposed conclusions. The nonpartisan Migration Policy Institute (MPI)—which includes former INS Commissioner Doris Meissner as one of its senior fellows—has conducted comprehensive reviews of the 287(g) program and has found it lacking in numerous respects (Capps, Rosenblum, Rodriguez, and Chishti, 2011; Rodriguez, Chishti, Capps, and St. John, 2010). MPI has noted how 287(g) uncomfortably embraces both targeted and universal programs of alien removal and in so doing sends mixed policy signals to law enforcement and the U.S. public alike. The original rationale for 287(g) offered by ICE to Congress was that the program would target criminal aliens and individuals who pose a threat to U.S. border security.[2] The manner in which the program has actually been implemented, observes MPI, attests to a different set of priorities: Half of the immigration detainers issued have been on people who have committed mere misdemeanors or traffic offenses. An immense—and deeply troubling—difference exists between the public face of the 287(g) program as espoused by ICE and the Obama administration, and the reality of how it has been experienced in communities across the United States.

This divergence between official rhetoric and reality has been the source of fierce criticism by America's civil rights and immigrant advocacy communities. In 2009, a coalition of more than 500 faith-based groups and nongovernmental organizations wrote to President Obama demanding that he end the 287(g) program.[3] Authored by the National Immigration Law Center and signed by more than 500 concerned civic organizations, the letter condemned the racial profiling and civil rights abuses it asserted had resulted from 287(g) operations nationwide (National Immigration Law Center, 2009).

That same year, the Justice Strategies research organization issued a blistering report titled *Local Democracy on ICE: Why State and Local Governments Have No Business in Federal Immigration Law Enforcement* (Shahani and Greene, 2009). The report recounted what it termed the massive failures in both the conception and the implementation of the 287(g) program. It criticized the general trend of "the devolution of civil immigration enforcement to criminal justice agencies" (p. 1), with 287(g) epitomizing the glaring failures of this larger approach. The report excoriated ICE for its failure to supervise local law enforcement agents properly and for an even more basic failure to prioritize regions in the United States that were heavily impacted by illegal alien criminal activity. Instead, alleged the report, race rather than crime propelled the 287(g) program growth.

2. *The 287(g) Program: Ensuring the Integrity of America's Border Security System through Federal-State Partnerships*, 109th Cong. 34 (2005) (Testimony of Paul M. Kilcoyne).

3. Co-signers of the letter included the American Civil Liberties Union, the Anti-Defamation League, the Center for Constitutional Rights, the Mexican American Legal Defense and Educational Fund, the NAACP Legal Defense Fund, Pax Christi USA, the Southern Poverty Law Center, as well as numerous state and local organizations.

The Justice Strategies report (Shahani and Greene, 2009) also took the federal government to task for what it characterized as fundamental misrepresentations about the program itself. Although it is marketed as a public safety measure to get "criminal illegal aliens" off U.S. streets, 287(g) instead has arguably led to the massive deportation of nonviolent "day laborers and drivers of color" (p. 2). Shahani and Greene further charged ICE with misrepresentation in touting the 287(g) program as a net money saver when, in fact, it typically transfers the real costs of the program to local taxpayers. Among Shahani and Greene's final recommendations was a call for the neutral U.S. Government Accountability Office (GAO) to investigate the program.

Such a neutral review was not long in coming. A 2009 GAO review of 287(g) revealed significant programmatic deficiencies, beginning with the fact that ICE had not adequately documented the program's objectives. While stating that the goal of the program was to address serious crime, ICE had not included this objective in program materials disseminated to state and local law enforcement partners. As a result, the GAO observed, individuals were being detained and removed for minor crimes such as speeding violations in clear contravention of the general stated goal of the program. The GAO also concluded that ICE had further failed to indicate to local law enforcement partners what data should be tracked or how this information should be collected and reported. The GAO report, titled *Immigration Enforcement: Better Controls Needed over Program Authorizing State and Local Enforcement of Federal Immigration Laws*, painted a picture of a law enforcement program murky in its conception and in pressing need of much greater transparency (U.S. GAO, 2009).

The Department of Homeland Security Weighs In

Pursuant to such governmental and nongovernmental criticisms, the Department of Homeland Security's Office of the Inspector General (OIG) conducted its own audit of the 287(g) program in 2010.[4] The findings of the OIG audit (OIG, 2010a) were as sobering as they were revealing. The OIG documented many instances in which ICE and participating law enforcement agencies were not operating in compliance with the terms of the 287(g) agreements. The OIG audit further highlighted specific areas in which ICE had not instituted effective program controls. These included (a) failures to establish appropriate performance measures and targets, (b) failures to develop supervision guidelines, (c) failures to promote adequate program oversight, (d) inadequate selection and review processes of local law enforcement agency partners, (e) failures to establish data collection and reporting requirements necessary for addressing civil rights and civil liberties concerns, (f) the need to improve 287(g) training programs, (g) the need for more accurate and more accessible

4. The OIG conducted two related audits in 2010: an initial March review titled *The Performance of 287(g) Agreements* (OIG, 2010a) and a follow-up report in December of that year titled *The Performance of 287(g) Agreements Report Update* (OIG, 2010b).

public information regarding the program, and (h) standardization of 287(g) officers' access to Department of Homeland Security information systems.

The OIG produced 33 recommendations for ICE to strengthen management controls and to improve its oversight of 287(g). Among these were recommendations that ICE realign the program to focus—as ICE had originally claimed it would—on what it called "Level 1 Aliens." This group includes undocumented foreign nationals convicted or arrested for major drug offenses or violent offenses such as murder, robbery, rape, manslaughter, and kidnapping. OIG reached the same conclusion, as had the GAO and countless nongovernmental organizations, that 287(g) program resources had not been focused on aliens who pose the greatest risk to the U.S. public.

The OIG audit called for much greater communications between ICE supervisory agents and the local law enforcement officers who depended on that supervision. OIG was especially concerned by the reports of many local law enforcement officers in the program who indicated that they had direct contact with their ICE supervisors only once a month. The OIG Report (OIG, 2010b) also called for greater oversight by steering committees, developing guidelines for responding to complaints about 287(g) officers, and weighing the civil rights records of local law enforcement agencies much more heavily when they applied for 287(g) funding. ICE concurred with 32 of the 33 recommendations made by the Office of the Inspector General.

Tellingly, ICE refused to concur with the recommendation that it establish collection and reporting standards that would provide objective data for measuring whether civil rights violations were occurring under the aegis of 287(g) operations (OIG, 2010a). Even more inexplicably, ICE based its refusal on the ground that it was "assessing the goal of this recommendation" (p. 53). The curious logic of its own argument seems to have been lost on ICE: It insisted that racial profiling was not occurring but refused to track the data that would corroborate its claim.

The other relevant recommendation made by the Office of the Inspector General dealt with the misrepresentations to the American public by ICE regarding the 287(g) program. The OIG insisted that in the future, ICE "[e]nsure the accuracy of information disseminated to the public about the goals of the 287(g) program, its various operations, and how immigration enforcement activities are carried out in the actual working environment" (p. 57). ICE concurred with this recommendation, and it will be incumbent on the agency to approach such efforts as more than just a challenge of better marketing or spin control. Given the track record of the 287(g) program to date, skepticism on the part of U.S. civil liberty groups would seem to be warranted as they await future agency communications regarding this problematic enforcement initiative.

287(g) Redux

Despite widespread criticisms and calls to end the program, the Obama administration instead chose to retool it. In the wake of the 2009 GAO audit (GAO, 2009), DHS Secretary

Janet Napolitano announced that ICE would sign 11 new 287(g) agreements. However, this expansion of the program also would be accompanied by the introduction of a revised and newly standardized agreement meant to provide closer federal oversight and a central focus on removing "dangerous" criminals. The introduction of this new Standardized Agreement and its use in all ongoing 287(g) operational sites has clearly resulted in much-needed improvements and better institutional oversight. Almost 70 jurisdictions nationwide now use the program, and it seems to involve closer federal oversight and better training than in its previous iterations (Capps et al., 2011). Significant concerns about the program remain, however.

Capps et al. (2011) found that at the national level, the program was still not targeted primarily or even mostly at serious criminal offenders. Half of the immigration detainers issued by 287(g) law enforcement officers continued to be on people who had committed misdemeanors or traffic violations.[5] This clear and ongoing discrepancy remains in sharp variance with the program's central objective of removing dangerous criminal aliens.

Capps et al. (2011) also found that local law enforcement jurisdictions seemed to control the choice of whether they would employ a universal or a targeted approach in their 287(g) operations. This finding also raises serious concerns, not just for reasons of arbitrariness but because it allows local political pressures and political grandstanding to shape federal removal policies. And even as federal authorities continue to investigate Sheriff Arpaio for possible civil rights violations in Maricopa County, they cling obstinately to a program that allows a local sheriff such as Arpaio to determine the priorities of how 287(g) will be implemented on the ground. Predictably, this leads to vastly different enforcement approaches. Capps et al. (2011) found that some jurisdictions such as Las Vegas placed more than half their immigration detainers on level 1 offenders (criminal aliens responsible for the most serious crimes) during the FY 2010. In contrast, during that same fiscal year, less than 10% of the detainers issued in jurisdictions such as Prince William County (VA) and Cobb County (GA) were on level 1 offenders.

The Prince William County Experience

The case study by Koper et al. (2013) on Prince William County and the 287(g) program experience there is a revealing one. The 2007 decision of the Prince William County Board of County Supervisors to enlist their police department in the program generated acrimonious local debate and intense media scrutiny nationwide. Advocacy groups and the press have followed the county's situation closely for several years. Pursuant to the County Board's decision, in March 2008, the Prince William Police Department implemented an initial

5. In the first 10 months of FY 2019, roughly half of the detainers issued by 287(g) officers nationwide were on people with level 1 offenses (violent crimes and major drug offenses) or level 2 offenses (minor drug or property crimes). The other half were served on people with misdemeanor offenses, traffic violations, or noncriminal immigration offenses.

and aggressive version of 287(g) (Prince William County Police Department, 2008). Under the terms of this initial policy, local police were required to investigate the immigration status of *any* person they detained (including in traffic stops) where there was probable cause that the person was not in the country legally. The policy almost immediately raised the specter of racial profiling and civil rights lawsuits, and it was suspended after less than 2 months.

A modified policy was then introduced that remains in effect today. It requires officers to investigate the immigration status of persons who are arrested for a violation of a state law or county ordinance when such encounters result in a custodial arrest. Importantly, the police department in Prince William County has undertaken major outreach efforts to the community regarding this revised program, including heightened efforts to respond to concerns of the county's Spanish-speaking population. Materials widely distributed by law enforcement in the county include strong public commitments that police will focus on illegal aliens who commit crimes, will protect victims and witnesses of crimes regardless of their immigration status, and will never resort to racial profiling.[6]

Koper et al. (2013) consider the effects of local immigration enforcement upon the incidence of crime in Prince William County as a result of 287(g). Although it focuses on this one county, the study also meets a larger gap in empirical criminological studies: the question of how immigration enforcement by local law enforcement agencies impacts overall incidence of crime in U.S. communities. Koper et al.'s findings are instructive: The decision to become part of the 287(g) program seems to have had no discernible effect on most forms of crime there (including robberies, property crimes, drug offenses, disorderly behaviors, and drunk driving violations). There was one striking exception to this pattern, however: The researchers found that aggravated assaults declined 27% in the time period after the initial announcement of the county's original policy in July 2007.

Both Koper et al.'s (2013) findings and the interpretations of their findings merit discussion. The researchers concluded that illegal immigrants in the county in reality accounted for a small percentage of offenders for most crimes, particularly serious ones. The researchers noted a dramatic decrease in aggravated assaults reported between July and December 2007—the period after the announcement of the local 287(g) initiative but before the policy was even implemented. In other words, it was the *announcement* of the policy rather than the policy's subsequent law enforcement operations that seems to account for the decrease. Any deterrent effect that the policy may have had most likely occurred *prior* to the policy's implementation. This anomaly once again points to how perceptions may inform public decision making in ways that proceed apart from reality and empirical evidence.

6. These pledges are featured on a police community handout last revised on June 18, 2008.

Other observations of the research by Koper et al. (2013) also deserve mention. They found that contrary to the perceptions of many county residents who pushed for the adoption of the 287(g) program, crime in Prince William County was *not* on the increase in 2007. In fact, it was on a steady decline, which is consistent with patterns in many other regions of the United States during that time period. Once again, public perceptions of the situation seem to have been at a variance with the reality. The researchers observe that the undocumented immigrant population in Prince William County seems to have declined noticeably in the years after the implementation of the 287(g) initiative there. This decline, however, does not correlate with any decrease in crime in the county. Koper et al. further conclude that the modified 287(g) policy in effect since April 2008 has not produced any clear effects on crime.

Koper et al. (2013) are appropriately cautious about overgeneralizing from their findings. They note that the downturn in the U.S. economy since 2007 and diminished job opportunities may account more coherently than the 287(g) initiative for the decreased presence of undocumented immigrants in Prince William County in recent years. The researchers also note that the introduction of the 287(g) initiative had another cost for the county in the noticeable rift that it created between police and the immigrant community. This rift is perceived as having diminished somewhat since 2007, but several police officers interviewed for the research project observe that immigrant distrust of law enforcement lingers.

Other researchers who have considered Prince William County as a case study reach conclusions that for the most part are consistent with those of Koper et al. (2013). A study done by the University of Virginia in 2010 (Center for Survey Research, University of Virginia, 2010) concluded that 287(g) had not affected most types of crime in Prince William County in large part because illegal immigrants accounted for only a small percentage of the overall arrests there. The Virginia study noted that approximately 70% of the arrests of illegal immigrants in Prince William County involved only three specific offenses: public drunkenness, driving while intoxicated, and driving without a license. Noting the same significant decrease in reports of aggravated assaults as reported by Koper et al., the Virginia researchers speculated that it might be attributable to the publicity surrounding the adoption of the policy in its original form, but also it might be the result of reduced assault reports by both legal and illegal immigrants.

The ultimate conclusions drawn by the Virginia research team (Center for Survey Research, University of Virginia, 2010) are curious. Having acknowledged the low incidence of serious crime commission by illegal aliens, they nonetheless posited that the second version of Prince William County's 287(g) initiative (mandating immigration checks only for arrestees) "appears to be a reasonable way of targeting illegal immigrants who are serious offenders" (p. xv). The low numbers of illegal aliens apprehended in this fashion, as well as the imperceptible net effects of the revised policy, do not lend ready support to this interpretation. Again, perception rather than reality seems to color the conclusion.

The reasonableness of the Prince William County 287(g) policy was the focus of a 2009 study by Singer, Wilson, and DeRenzis (2009). Singer et al. identified several factors that led to the restrictionist policy on immigration there. Among these were the failures of Congress to respond to the nation's immigration challenges, an unpreparedness on the part of the Prince William County local government to respond to newly arrived immigrants, a lack of service infrastructure for immigrants in the county, disproportionate national media attention, and the pressures of local county election campaigning. Singer et al. concluded that it was concerns of longtime county residents regarding a reduction in quality of life and a fear of property value declines that drove policy making rather than any actual increase in crime.

Singer et al. (2009) noted one result of the 287(g) program in Prince William County not considered by the other researchers: the estimated $11.3 million price tag for 5 years of 287(g) operations. At the time Singer et al.'s study, Prince William County had been hard hit by the nationwide decline in the economy. It had the highest number of foreclosed homes of any county in the region, unemployment was on the rise, and home values were sinking. In such circumstances, the $11.3 million price tag of the 287(g) program made it look like anything other than reasonable from a fiscal perspective. The 287(g) cure, in fact, seemed far worse than the illegal immigration disease.

The Uncertain Future of 287(g)

Serious concerns about the 287(g) program persist. Not the least is the continued discrepancy between the program's constantly reiterated goal of removing dangerous illegal criminal aliens from the United States and the reality that half of those removed are the proverbial day laborers and traffic violators. The latitude granted to local law enforcement as to whether officers will pursue a universal or a targeted approach to enforcement also is troubling: It outsources federal policy decision making to the most local of law enforcement "deciders."

The community task force model of 287(g) has proved most controversial and problematic, and its exceedingly low impact on serious crime suggests that it should be either discontinued or greatly circumscribed. Ironically, it is the jail version of 287(g) that actually accounts for a full 90% of the immigration detainers issued nationwide, and this model of the program evokes far less public outcry (it largely avoids charges of racial profiling and ideally focuses on illegal immigrants who are subjects of custodial arrest for noncivil and nonmisdemeanor crimes). The 287(g) jail model is of course not immune to criticism, as the decision by a local law enforcement officer to initiate a custodial arrest remains beyond the oversight of ICE supervisors. Versions of the jail model such as the one adopted by the Los Angeles County Jail seem to be the most appropriate: Immigrants there are screened for immigration status and removability only after *conviction* for a criminal offense (Capps et al., 2011).

If the ultimate criterion for assessing 287(g) is whether it has succeeded in removing undocumented immigrants from the United States, the answer might be a highly qualified

"yes." But even here, it is difficult to disaggregate the effects of 287(g) from the effects of the drastic downturn in the U.S. economy of the last decade that led to a marked decrease in the presence of illegal immigrants not only in Prince William County but also nationwide. If the question is whether 287(g) has succeeded in removing dangerous criminal aliens from U.S. communities, then the program seems to be far from a success. It remains an important lesson in what can happen when perceptions are allowed to trump reality in areas of public policy making and crime.

References

Bolick, Clint. 2008. *Mission Unaccomplished: The Misplaced Priorities of the Maricopa County Sheriff's Office*. Phoenix, AZ: Goldwater Institute Policy Report.

Capps, Randy, Marc R. Rosenblum, Cristina Rodriguez, and Muzzafar Chishti. 2011. *Delegation and Divergence: A Study of 287(g) State and Local Immigration Enforcement*. Washington, DC: Migration Policy Institute.

Center for Survey Research, University of Virginia & Police Executive Research Forum. 2010. *Evaluation Study of Prince William County's Illegal Immigration Enforcement Policy, Final Report 2010*. Charlottesville, VA: Author.

International Association of Chiefs of Police (IACP). 2007. *Police Chiefs Guide to Immigration Issues*. Alexandria, VA: Author.

Khashu, Anita. 2009. *The Role of Local Police: Striking a Balance Between Immigration Enforcement and Civil Liberties*. Washington, DC: The Police Foundation.

Koper, Christopher S., Thomas M. Guterbock, Daniel J. Woods, Bruce Taylor, and Timothy J. Carter. 2013. The effects of local immigration enforcement on crime and disorder: A case study of Prince William County, Virginia. *Criminology & Public Policy*, 12: 239–276.

Lin, Joanne. 2010. End it: 287(g) is beyond repair and harms local communities every day. American Civil Liberties Union Blog of Rights. Retrieved August 29, 2013 from aclu.org/blog/content/end-it-287g-beyond-repair-and-harms-local-communities-every-day.

National Immigration Law Center. 2009, August 25. *Letter to President Obama Demanding an End to the 287(g) Program*.

Nowrasteh, Alex. 2012. President Obama: Deporter-In-Chief. *Forbes Magazine*. July 30.

Office of the Inspector General (OIG). 2010a. *The Performance of 287(g) Agreements*. Washington, DC: Department of Homeland Security.

Office of the Inspector General (OIG). 2010b. *The Performance of 287(g) Agreements Report Update*. Washington, DC: Department of Homeland Security.

Prince William County Police Department. 2008. *Local Enforcement Response to Illegal Immigration (resource pamphlet)*. Manassas, VA: Author.

Rodriguez, Cristina, Muzaffar Chishti, Randy Capps, and Laura St. John. 2010. *A Program in Flux: New Priorities and Implementation Challenges for 287(g)*. Washington, DC: Migration Policy Institute.

Shahani, Aarti and Judith Greene. 2009. *Local Democracy on ICE: Why State and Local Governments Have No Business in Federal Immigration Law Enforcement*. Brooklyn, NY: Justice Strategies.

Singer, Audrey, Jill H. Wilson, and Brooke DeRenzis. 2009. *Immigrants, Politics, and Local Response in Suburban Washington*. Washington, DC: Metropolitan Policy Program at Brookings.

U.S. Government Accountability Office (GAO). 2009. *Immigration Enforcement: Better Controls Needed over Program Authorizing State and Local Law Enforcement of Federal Immigration Laws*. Washington, DC: Author.

Vaughan, Jessica. 2006. *Attrition Though Enforcement: A Cost-Effective Strategy to Shrink the Illegal Alien Population*. Washington, DC: Center for Immigration Studies.

Vaughan, Jessica and James R. Edwards. 2009. *The 287(g) Program: Protecting Home Towns and Homeland*. Washington, DC: Center for Immigration Studies.

Statutes Cited

Illegal Immigration Reform & Immigrant Responsibility Act of 1996, H.R. 3610; Pub.L. 104–208; 110 Stat. 3009–546 (1996).

The Immigration and Nationality Act of 1952, Public Law No. 82–414 (1952).

Terry Coonan, J.D., is the executive director of the Center for the Advancement of Human Rights at Florida State University. He teaches in the Florida State University (FSU) College of Criminology and Criminal Justice, as well as in the FSU College of Law. His research and legal advocacy efforts focus on immigration law and policy, human rights and crime, and human trafficking.

Encouraging Policy Makers and Practitioners to Make Rational Choices about Programs Based on Scientific Evidence on Developmental Crime Prevention

David P. Farrington
Cambridge University

The research article by Matthew Manning, Christine Smith, and Ross Homel (2013, this issue) describes a method of encouraging policy makers and practitioners to take account of scientific evidence in choosing which developmental crime prevention programs should be implemented. Many researchers have complained that policy makers and practitioners have not paid enough attention in the past to scientific evidence about what works. For example, Welsh and Farrington (2012a) discussed this issue in detail, pointing out the need to overcome the "short-termism" politics of the day and to strike a better balance between crime prevention and crime control. They stated (p. 129):

> Integral to the evidence-based paradigm, whether in the context of crime prevention, policing, sentencing, or correctional treatment, is the notion that decision-makers are rational actors who will take account of the best available information in making public policy. . . . What is really at issue here is the need to increase the influence of research on policy or, in a manner of speaking, put systematic research evidence at center stage in the policy-making (and political) process.

Effectiveness of Developmental Crime Prevention

Developmental prevention refers to interventions designed to prevent the development of criminal potential in individuals, especially those targeting risk and protective factors discovered in longitudinal studies of human development (Farrington and Welsh, 2007; Welsh and Farrington, 2010). It is commonly distinguished from situational prevention,

Direct correspondence to David P. Farrington, Institute of Criminology, Cambridge University, Sidgwick Avenue, Cambridge CB3 9DA, U.K. (e-mail: dpf1@cam.ac.uk).

DOI:10.1111/1745-9133.12043

community prevention, and criminal justice prevention (Tonry and Farrington, 1995; Welsh and Farrington, 2012b). A key question facing policy makers is as follows: Is it better to invest in developmental prevention, situational prevention, more police, or more prisons? This question has been addressed in two ways: first, by studying the effects of programs on offending (and other life outcomes); second, by comparing the monetary costs and monetary benefits of programs, to establish how to get the best "bang for the buck."

Many experimental evaluations of developmental prevention programs and many systematic reviews and meta-analyses have summarized knowledge about their effectiveness. In addition to the meta-analysis by Manning, Homel, and Smith (2010), there are meta-analyses of family programs by Farrington and Welsh (2003) and Piquero, Farrington, Welsh, Tremblay, and Jennings (2009), of child skills training programs by Lösel and Bender (2012), of mentoring programs by Tolan and his colleagues (2013), and of bullying prevention programs by Ttofi and Farrington (2011), to mention only a few. Generally, these reviews have concluded that, unlike deterrence-based programs such as "scared straight" (Petrosino, Turpin-Petrosino, Hollis-Peel, and Lavenberg, 2013) and juvenile justice system processing (Petrosino, Turpin-Petrosino, and Guckenburg, in press), developmental prevention programs are effective in reducing later offending.

Although a great deal is known about the short-term effectiveness of developmental prevention programs, much less is known about their long-term effects. Experimental evaluations with long-term follow-ups have been reviewed by Dekovic and her colleagues (2011) and Farrington (2013). Only 12 large-scale (at least $N = 100$) longitudinal-experimental studies with a follow-up period after the intervention of at least 10 years were found by Farrington and Welsh (2013). Some of these studies (e.g., McCord, 1990; Schweinhart et al., 2005) measured many different life outcomes at different ages. In the hope of encouraging more studies of this kind, Farrington and MacKenzie (in press) edited a special issue of the *Journal of Experimental Criminology* on long-term follow-ups of experimental interventions. Clearly, more studies of this kind are needed to establish the long-term effects of developmental prevention programs, including the effects on the next generation.

There have been many reviews of cost–benefit analyses in criminology, including cost–benefit analyses of developmental prevention. The first reviews were completed by Welsh and Farrington (2000) and Nagin (2001), and the first book on this topic, bringing together most of the key researchers at that time, was published by Welsh, Farrington, and Sherman (2001). The conclusions of these and later reviews (e.g., Dossetor, 2011; McIntosh and Li, 2012; Roman, Dunworth, and Marsh, 2010) were generally optimistic: The monetary benefits of most programs outweigh their monetary costs.

The most extensive cost–benefit analyses of all types of intervention programs have been carried out by Steve Aos and his colleagues, who carefully quantified the monetary costs and benefits of programs in Washington State. For example, in the latest publication (Lee et al., 2012), they concluded that the benefit-to-cost ratio was 4.36 for multisystemic therapy, 10.42 for functional family therapy, and 4.95 for treatment foster care. This research

encouraged the Washington State legislature to reduce its planned prison building program and instead invest in a portfolio of evidence-based crime prevention programs (Drake, Aos, and Miller, 2009). This is an outstanding example of the influence of research on public policy, which both saved money and reduced crime.

Research of Manning et al.

Manning and his colleagues (2013) aimed to overcome some of the perceived problems of previous cost–benefit analyses, in particular, the fact that they do not measure the effects of programs on multiple life domains and do not measure long-term benefits across the life course. These researchers adapted techniques called multiple-criteria decision making (MCDM) and the analytical hierarchy process (AHP). They canvassed opinions of key stakeholders (policy makers, preschool/school leaders, community agency staff, and academics) about the relative importance of seven life outcome domains and about the relative effectiveness of five early childhood programs.

Manning and his colleagues provided decision makers with a structured protocol for comparing program alternatives using utility preferences, taking account of the results of their meta-analysis (Manning et al., 2010), and focusing on well-being across the life course. The respondents indicated that family well-being and socio-emotional development were most important for the quality of life in adolescence, and that structured preschool programs incorporating family intervention and support were the most effective. Importantly, their Figure 5 shows what were considered to be the best programs for addressing different life outcomes. Manning and his colleagues argue that this method, using relative utilities, should lead to better policy decisions.

The three policy essays all make very interesting and thoughtful points. Max Crowley (2013, this issue) points out that there is a role for both utility approaches and economic analyses. Indeed, it seems to me that Manning and his colleagues could (and perhaps should) have presented their respondents with the results of cost–benefit analyses rather than giving them effect size measures (which seem less easily understandable). Crowley also considers that their results may be specific to particular times, places, and respondents, and that it is important to repeat their research in different settings with larger samples of programs and respondents. He also argues that it is important to investigate what infrastructure is needed to support the delivery of developmental prevention programs, and that targeting children and families may be attractive to policy makers because the long-term effects on children may be balanced by the short-term effects on families. Furthermore, Crowley advocates the need for innovative methods of investing in crime prevention programs, including social impact bonds.

Abigail Fagan (2013, this issue) focuses on how to improve the translation of scientific research into public policy and practice. She considers that an advantage of MCDM is that it provides a forum for stakeholders to learn about and discuss evidence about what works. It also encourages scientists and practitioners to learn from each other's wisdom, experience,

and knowledge. However, Fagan considers that the method focuses too heavily on issues of concern to scientists and does not focus sufficiently on the concerns of practitioners, especially the degree to which an agency has the financial resources, personnel, facilities, technology, and partners to deliver an intervention effectively. She thinks that MCDM does not compare the strengths and weaknesses of programs with current practices (with which policy makers and practitioners may be very happy), and she is concerned about how easily participants will reach a consensus about how to deal with conflicts in decision making. Most importantly, she advocates that new methods should be added to established approaches such as *Communities That Care* and that researchers should investigate the effectiveness of MCDM in increasing the rates at which stakeholders really do adopt evidence-based programs.

Christopher Sullivan (2013, this issue) advocates the need for research on how policy makers and practitioners make decisions about programs and what factors influence those decisions. He is not surprised that the meta-analytic results had little impact on the program preferences. He considers that it is important to compare developmental prevention with other approaches that may be chosen for political reasons (although Welsh and Farrington [2011] showed that citizens often preferred developmental prevention to harsher sentences). Sullivan also emphasizes the importance of program implementation and how to scale up from demonstration programs to large-scale routine practice. Furthermore, he advocates the need for experiments on decision making with large numbers of participants and validation studies of the consistency between stated preferences and later decisions.

Conclusions

Manning and his colleagues (2013) have presented a method that can be used to encourage policy makers and practitioners to make rational choices about programs based on scientific evidence on the effectiveness of developmental crime prevention. Their work has many implications for fundamental research, including the need for long-term follow-ups of intervention programs. However, the commentators have focused especially on the practical problems of implementing their method widely. It seems that the method needs to be tested in different settings with different stakeholders, and the preferences need to be validated against later actual choices of programs. Most importantly, this method needs to be combined with rather than contrasted with cost–benefit analysis; stakeholders should be provided with the results of cost–benefit analyses and returns on investment, as in Washington State. Hopefully, this body of research will advance knowledge about how to encourage policy makers and practitioners to adopt evidence-based crime prevention. That would surely be in everyone's interests.

References

Crowley, D. Max. 2013. Building efficient crime prevention strategies: Considering the economics of investing in human development. *Criminology & Public Policy*, 12: 353–366.

Dekovic, Maja, Meike I. Slagt, Jessica J. Asscher, Leonieke Boendermaker, Veroni I. Eichelsteim, and Peter Prinzie. 2011. Effects of early prevention programs on adult criminal offending: A meta-analysis. *Clinical Psychology Review*, 31: 532–544.

Dossetor, Kym. 2011. *Cost-Benefit Analysis and its Application to Crime Prevention and Criminal Justice Research* (AIC Reports: Technical and Background Paper 42). Canberra: Australian Institute of Criminology.

Drake, Elizabeth K., Steve Aos, and Marna G. Miller. 2009. Evidence-based public policy options to reduce crime and criminal justice costs: Implications in Washington state. *Victims & Offenders*, 4: 170–196.

Fagan, Abigail A. 2013. Enhancing the quality of stakeholder assessments of evidence-based prevention programs. *Criminology & Public Policy*, 12: 333–341.

Farrington, David P. 2013. Longitudinal and experimental research in criminology. In (Michael Tonry, ed.), *Crime and Justice in America 1975–2025*, Vol. 42. Chicago, IL: University of Chicago Press.

Farrington, David P. and Doris L. MacKenzie. In press. Long-term follow-ups of experimental interventions. *Journal of Experimental Criminology.*

Farrington, David P. and Brandon C. Welsh. 2003. Family-based prevention of offending: A meta-analysis. *Australian & New Zealand Journal of Criminology*, 36: 127–151.

Farrington, David P. and Brandon C. Welsh. 2007. *Saving Children from a Life of Crime: Early Risk Factors and Effective Interventions*. Oxford, U.K.: Oxford University Press.

Farrington, David P. and Brandon C. Welsh. 2013. Randomized experiments in criminology: What has been learned from long-term follow-ups? In (Brandon C. Welsh, Anthony A. Braga, and Gerben J. N. Bruinsma, eds.), *Experimental Criminology: Prospects for Advancing Science and Public Policy*. New York: Cambridge University Press.

Lee, Stephanie, Steve Aos, Elizabeth Drake, Annie Pennucci, Marna Miller, and Laurie Anderson. 2012. *Return on Investment: Evidence-based Options to Improve Statewide Outcomes*. Olympia: Washington State Institute for Public Policy.

Lösel, Friedrich and Doris Bender. 2012. Child social skills training in prevention of antisocial development and crime. In (Brandon C. Welsh and David P. Farrington, eds.), *The Oxford Handbook of Crime Prevention*. Oxford, U.K.: Oxford University Press.

Manning, Matthew, Ross Homel, and Christine Smith. 2010. A meta-analysis of the effects of early developmental prevention programs in at-risk populations on non-health outcomes in adolescence. *Children and Youth Services Review*, 32: 506–519.

Manning, Matthew, Christine Smith, and Ross Homel. 2013. Valuing developmental crime prevention. *Criminology & Public Policy*, 12: 305–332.

McCord, Joan. 1990. Crime in moral and social contexts—the American Society of Criminology 1989 Presidential Address. *Criminology*, 28: 1–26.

McIntosh, Cameron and Jobina Li. 2012. *An Introduction to Economic Analysis in Crime Prevention: The Why, How and So What*. (Research Report 2012–5). Ottawa, Ontario: Department of Justice Canada.

Nagin, Daniel. 2001. Measuring economic benefits of developmental prevention programs. In (Brandon C. Welsh, David P. Farrington, and Lawrence W. Sherman, eds.), *Costs and Benefits of Preventing Crime*. Boulder, CO: Westview Press.

Petrosino, Anthony, Carolyn Turpin-Petrosino, and Sarah Guckenburg. In press. The impact of juvenile system processing on delinquency. In (David P. Farrington and Joseph Murray, eds.), *Labeling Theory: Empirical Tests*, Vol. 18. New Brunswick, NJ: Transaction.

Petrosino, Anthony, Carolyn Turpin-Petrosino, Meghan E. Hollis-Peel, and Julia G. Lavenberg. 2013. Scared straight and other juvenile awareness programs for preventing juvenile delinquency: A systematic review. *Campbell Systematic Reviews*, 2013: 5.

Piquero, Alex., David P. Farrington, Brandon C. Welsh, Richard E. Tremblay, and Wesley G. Jennings. 2009. Effects of early family/parent training programs on antisocial behavior and delinquency. *Journal of Experimental Criminology*, 5: 83–120.

Roman, John K., Terence Dunworth, and Kevin Marsh. 2010. *Cost-Benefit Analysis and Crime Control*. Washington, DC: Urban Institute Press.

Schweinhart, Lawrence J., Jeanne Montie, Zongping Xiang, W. Steven Barnett, Clive R. Belfield, and Milagros Nores. 2005. *Lifetime Effects: The High/Scope Perry Preschool Study Through Age 40*. Ypsilanti, MI: High/Scope Press.

Sullivan, Christopher J. 2013. Enhancing translational knowledge on developmental crime prevention: The utility of understanding expert decision making. *Criminology & Public Policy*, 12: 343–351.

Tolan, Patrick, David Henry, Michael Schoeny, Arin Bass, Peter Lovegrove, and Emily Nicholls. 2013. Mentoring interventions to affect juvenile delinquency and associated problems: A systematic review. *Campbell Systematic Reviews*, 2013: 10.

Tonry, Michael and David P. Farrington, eds. 1995. *Building a Safer Society: Strategic Approaches to Crime Prevention*, Vol. 19. Chicago, IL: University of Chicago Press.

Ttofi, Maria M. and David P. Farrington. 2011. Effectiveness of school-based programs to reduce bullying: A systematic and meta-analytic review. *Journal of Experimental Criminology*, 7: 27–56.

Welsh, Brandon C. and David P. Farrington. 2000. Monetary costs and benefits of crime prevention programs. In (Michael Tonry, ed.), *Crime and Justice*, Vol. 27. Chicago, IL: University of Chicago Press.

Welsh, Brandon C. and David P. Farrington. 2010. *The Future of Crime Prevention: Developmental and Situational Strategies*. Washington, DC: U.S. National Institute of Justice. Retrieved from crim.cam.ac.uk/people/academic_research/david_farrington/nijprev.pdf.

Welsh, Brandon C. and David P. Farrington. 2011. The benefits and costs of early prevention compared with imprisonment: Toward evidence-based policy. *Prison Journal*, 91: 120–137.

Welsh, Brandon C. and David P. Farrington. 2012a. Science, politics, and crime prevention: Toward a new crime policy. *Journal of Criminal Justice*, 40: 128–133.

Welsh, Brandon C. and David P. Farrington, eds. 2012b. *The Oxford Handbook of Crime Prevention*. Oxford, U.K.: Oxford University Press.

Welsh, Brandon C., David P. Farrington, and Lawrence W. Sherman, eds. 2001. *Costs and Benefits of Preventing Crime*. Boulder, CO: Westview Press.

David P. Farrington, O.B.E., is emeritus professor of psychological criminology and Leverhulme Trust Emeritus Fellow at the Institute of Criminology, Cambridge University. He received the Stockholm Prize in Criminology in 2013. His major research interest is in developmental criminology, and he is the Director of the Cambridge Study in Delinquent Development, which is a prospective longitudinal survey of more than 400 London males from age 8 to age 56. In addition to greater than 600 published journal articles and book chapters on criminological and psychological topics, he has published nearly 100 books, monographs, and government publications.

Overview of: "Valuing Developmental Crime Prevention"

Matthew Manning

Christine Smith

Ross Homel

Griffith University

Research Summary

Developmental crime prevention programs produce positive returns on investment. Previous studies of such returns have not adequately quantified and weighted impacts across multiple domains of quality of life (e.g., social-emotional development and family well-being) or have provided a protocol for deciding between programs that recognizes these multiple domains (i.e., propose a method for the ranking of program alternatives). We adapted a multiple-criteria decision-making (MCDM) technique to address these deficiencies. Incorporating subjective decisions (a survey of those individuals who directly affect policy decisions) and objective evidence (the effect sizes from a meta-analysis of longitudinal intervention outcomes) allowed us to construct a common metric for making structured choices between diverse developmental crime prevention program options. Our results show that a structured preschool program that incorporates family intervention and support was the most preferred option to reduce youth crime.

Policy Implications

The adapted MCDM technique employed in this study can be used to evaluate many crime prevention policy options that have effects that are spread across multiple domains and for which objective evidence from past research can usefully be combined with stakeholder judgments to recommend a preferred option.

Keywords

developmental crime prevention, *economic analysis*, *policy making*, *multicriteria analysis*

DOI:10.1111/1745-9133.12023

RESEARCH ARTICLE

DEVELOPMENTAL CRIME PREVENTION

Valuing Developmental Crime Prevention

Matthew Manning

Christine Smith

Ross Homel

Griffith University

Policy that invests in young children promotes equality and social justice as well as improvements in human capital and therefore economic productivity (Carneiro and Heckman, 2003; Heckman, 2006; Sen and Nussbaum, 1996). Particular benefits are realized from programs targeting socially disadvantaged groups because of factors such as a lack of financial resources and poor cognitive and noncognitive skills (e.g., capacity for concentration, empathy, social skills, and tenacity). Importantly, preventive interventions early in life targeting the most vulnerable have demonstrated positive returns on investment across the life course, for both the individuals concerned and the wider society (Welsh and Farrington, 2001; Wise, da Silva, Webster, and Sanson, 2005). Furthermore, well-delivered early prevention programs that are carefully targeted to at-risk groups can produce significantly higher returns on investment than remedial interventions focused on problem behavior or deficiencies in learning (Manning, Homel, and Smith, 2006). Interventions aimed at offenders and additional public expenditure on police also may prove to be a less efficient use of public resources than early prevention (Aos, Phipps, Barnoski, and Lieb, 2001; Heckman, 2006; Welsh and Farrington, 2001).

Arguments with respect to the economic benefits of investing in disadvantaged children and the positive rates of return to human capital investment have recently gained momentum, with policy makers now usually requiring evaluations of efficacy or effectiveness to produce measurements of economic benefits to supplement the noneconomic evidence (Cohen, Rust, Steen, and Tidd, 2004). This mandate has seen several crime prevention interventions and policies being evaluated using methods such as:

Direct Correspondence to Matthew Manning, Griffith University, School of Criminology and Criminal Justice, Mt Gravatt Campus, 176 Messines Ridge Road, Mt Gravatt, Queensland 4122 Australia (e-mail: m.manning@griffith.edu.au)

DOI:10.1111/1745-9133.12024

- Cost–benefit (e.g., Perry Preschool Project [Belfield, Nores, Barnett, and Schweinhart, 2006; Heckman, Moon, Pinto, Savelyev, and Yavitz, 2010] and youth justice and family support programs [Lee, Aos, Drake, Pennucci, Miller, and Anderson, 2012])
- Cost-savings (e.g., Elmira nurse-family partnership [Karoly et al., 1998; Olds, Henderson, Phelps, Kitzman, and Hanks, 1993])
- Cost-effectiveness analyses (e.g., three-strikes law and early interventions [Greenwood, Model, Rydell, and Chiesa, 1996]).

The benefits and shortcomings of these methods of economic evaluation have been well critiqued with respect to the placement (or difficulty of placement) of monetary values on outcomes, the types and numbers of outcomes measured, interpretation and generalizability of results, and comparability of results across different programs with varying methodologies (Boardman, Greenberg, Vining, and Weimer, 2001; Gold et al., 1996; Levin and McEwan, 2001; Manning et al., 2006).

Significant gaps in the economic evaluation of early prevention projects have included:

- The tendency for users of economic methods such as cost–benefit analysis and cost-savings analysis to avoid measuring the less tangible individual benefits resulting from the programs across the life course and across multiple domains (Nagin, 2001); for example, improvements in educational success, cognitive development, social-emotional development, family well-being, and reductions in deviance, to name a few
- The lack of a structured protocol for capturing and organizing all of the key elements required for making fully informed policy decisions (Manning, 2008); for example, using results derived from program evaluations, the judgments of expert researchers, practitioners, or policy makers or professional experience
- The lack of a common metric for comparing different kinds of interventions (e.g., home visiting and preschools) on a range of indicators linked to later deviance or criminal activity.

This article aims to address all these deficiencies by using multicriteria analysis (Mendoza and Macoun, 1999). The adapted method (Manning, 2008) allows one to value improvements in individual well-being arising from developmental crime prevention projects, particularly those delivered in the early years, by eliciting relative utility values or preference rankings. The method provides policy makers with a structured protocol for comparing program alternatives directly (using relative utility values/preferences) that incorporates both experience with past interventions and objective evidence (specifically a detailed meta-analysis of the impact of early-in-life interventions on adolescent outcomes [Manning, Homel, and Smith, 2010]). Furthermore, this method provides a more comprehensive picture of the impact of interventions on well-being across the life course than existing methods. The method generates a common metric outcome or set of common

metric outcomes from which policy makers can compare alternative forms of developmental crime prevention programs.

Several developmental pathways grounded in strong empirical research serve as the theoretical foundation of our policy evaluation tool. From the general perspective of long-term economic growth, developmental interventions delivered early in life affect future human capital formation because they influence, for example, workforce participation (Heckman, 2000). With respect to pathways to adolescent and adult antisocial behavior, Vitaro, Barker, Brendgen, and Tremblay (2011) proposed the following:

- A *behavioral* pathway: Early disruptiveness is a predictor of antisocial behavior during adolescence that in turn is an important predictor of adult criminal behavior (Farrington, 1995).
- Several *socio-environmental* pathways, such as:

(a) A parental supervision pathway (including positive parenting practices): Lack of such supervision can be linked to adolescent antisocial behavior and can be used to predict later criminal behavior (Larzelere and Patterson, 1990).

(b) A peer-related pathway: An association with antisocial deviant peers can nurture an antisocial lifestyle and contact with the criminal justice system (Elliott and Menard, 1996).

(c) A school-related pathway: School engagement (including being prepared for various transitions such as from preschool to elementary school) is positively correlated with perseverance, school adjustment, and school completion. Being prepared to learn, having positive social experiences in school, and ultimately being successful at school (i.e., completing high school) will minimize the chances of adolescent and adult antisocial behavior and engagement in criminal activity (Reynolds, Ou, and Topitzes, 2004).

In the next section, we build on these various pathways in summarizing the importance of developmental crime prevention interventions. We also outline the benefits, as proposed by Nagin (2001), which are associated with measuring outcomes of well-being and quality of life from an individual perspective. Using data collected from experts who make or contribute to policy in this area, we demonstrate how multicriteria analysis, specifically the analytical hierarchy process (AHP), can be used to address complex crime prevention policy problems.

Economic Benefits of Investing Early in Disadvantaged Children

The National Science Foundation (1994) when announcing its Human Capital Initiative *Investing in Human Resources*, stated that:

> [H]uman capital of a nation is a primary determinant of its strength. A productive and educated workforce is a necessity for long-term economic growth.

> Worker productivity depends on the effective use and development of the human capital of all citizens, which means that schools, families, and neighborhoods must function effectively. (p. 1)

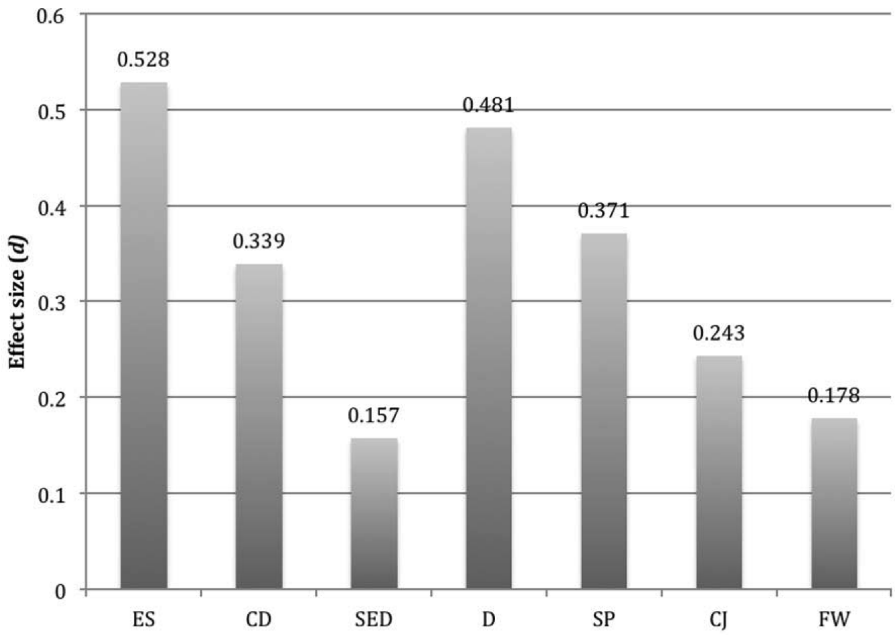
Savings from investment in disadvantaged communities accrue in the areas of criminal justice (courts, police, and corrections), private security (e.g., alarms, private guards, and security systems), urban decay (e.g., lost jobs and relocation of residents), property loss (e.g., stolen goods), medical care (e.g., treating victims of crime), and individual well-being (e.g., pain and suffering and loss of quality of life) (Mandel, Magnusson, Ellis, DeGeorge, and Alexander, 1993; Welsh, Farrington, and Sherman, 2001). Moreover, the cost inefficiencies associated with remedial interventions normally delivered to adolescents and young adults (Manning et al., 2006) strengthen the case for investment early in life or at critical points of vulnerability and opportunity later in life.

Particularly compelling evidence exists for the effectiveness of evidence-based early prevention directed toward disadvantaged children and their families (Reynolds, Wang, and Walberg, 2003). The benefits of these programs are sustained well into adolescence and early adulthood in outcome domains as diverse as cognitive development (CD), educational success (ES), social-emotional development (SED), deviance (D), social participation (SP), criminal justice contact (CJ), and family well-being (FW) (Manning et al., 2010). What is particularly noteworthy is the strength of effects 10–15 years after the initial interventions across all outcome domains and all program types: structured preschool programs, center-based developmental day care, home visitation, family support services, and parental education (Figure 1). The average effect sizes in Figure 1 range from 0.157 for SED to 0.528 for ES indicating a significant but small-to-medium effect size based on Cohen's *d* (Cohen, 1992).

The economic analyses of early prevention point to significant returns on investment (Karoly, Kilburn, Bigelow, Caulkins, and Cannon, 2001; Lee et al., 2012; Welsh and Farrington, 2001). For example, the Perry Preschool program produced rates of return of 15% to 17% (Rolnick and Grunewald, 2003), where rate of return was calculated as increments in earning and other outcomes per year for each dollar invested. A cost–benefit analysis of the Perry Preschool project at age 40 revealed that individuals in the treatment group achieved significantly higher earnings. Return on investment to the public included higher tax revenues, lower criminal justice system expenditures, and lower welfare payments. Overall the program returned $12.90 as savings for taxpayers/victims for every $1 invested (Belfield et al., 2006). A more recent analysis of the rates of return from the High Scope Perry Preschool program estimates annual social rates of return of between 7% and 10% (Heckman et al., 2010), but this study involves a different set of assumptions regarding the tax system than earlier studies. A comparison by Lee et al. (2012) of a range of interventions involving functional family therapy, child support, juvenile justice programs, and pre-kindergarten to grade 12 education demonstrated rates of return ranging from –$0.23 to

FIGURE 1

Weighted Average Effect Sizes (*d*) Corrected for Sample Size for Seven Adolescent Outcome Domains (ES, CD, SED, D, SP, CJ, and FW)



Notes. (a) Cohen's *d* is used to move beyond only knowing that a difference exists between populations tested (i.e., hypothesis testing) to identifying the strength and magnitude of a difference between two populations. Briefly, Cohen's *d* is calculated by dividing the mean difference between populations by the standard deviation, where: a result of 0.2 = small effect; 0.5 = medium effect; and 0.8 = large effect (Cohen, 1992). (b) The follow-up periods for the studies incorporated in the meta-analysis from which these *d* values have been calculated were on average 10–15 years after the intervention; that is, they were follow-ups on adolescents who had been the subject of an early childhood intervention.
Abbreviations. CD = cognitive development; CJ = criminal justice; D = deviance; ES = educational success; FW = family well-being; SED = social-emotional development; SP = social participation.
Source. Manning et al. (2010).

$57.79 for every dollar spent. Similarly a recent follow-up of the Chicago Child Parent Center Program estimated annual rates of return of between 10% and 18% (Reynolds, Temple, White, Ou, and Robertson, 2011). Finally a study by Aos et al. (2012) estimated returns to the state from investment in various forms of evidence-based interventions in Pre K to Year 12 education in the range $0.22 to $24.75 per dollar spent.

The economic analyses of early prevention programs using cost–benefit, cost-effectiveness, and cost-savings methods have been useful in quantifying the direct and indirect economic benefits, but they have been less useful with respect to less readily measured benefits such as improved quality of life. To overcome this deficiency, criminologists occasionally employ cost-utility analysis, a method used in health economics to evaluate the efficacy of a program and to make decisions regarding the allocation of public funds to often competing and disparate program alternatives (Gold et al., 1996). Stemming from this research, and in light of the obvious gaps in understanding the full effects of prevention alternatives, Nagin (2001) reviewed several approaches that would facilitate improvements in the economic methods used to measure the impact of intervention programs on outcomes in both the short and the long term. He proposed the development of a method that measures benefits across multiple domains, at different times, yet at the individual level. In addition, he argued that the methods applied by economists to measure the impact of prevention alternatives do not account for the valuable yet less tangible impacts these programs provide, such as increased public safety, or salient individual benefits, such as improved quality of life. In short, Nagin proposed that the natural unit of analysis in measuring the economic effectiveness of preventive interventions is the individual rather than society. This method leads to the search for improvements in a child's and his or her family's quality of life as a result of the intervention.

Following this approach, the analyst needs to identify and quantify the improvements to quality of life resulting from a developmental prevention program in order to create the denominator for cost-utility analysis. Methods such as willingness-to-pay and contingent valuation have been useful in monetizing these improvements, and for estimating the costs of crime (Cohen et al., 2004). These monetized measures have then been incorporated into cost–benefit analyses of crime prevention alternatives.

However, given the richness of meta-analytic data (Manning et al., 2010) regarding diverse early prevention programs and their impacts on various quality-of-life domains (e.g., educational success and social-emotional development) as given in Figure 1, a multistage process for identifying the benefits of early prevention is appropriate. Some results of our meta-analysis are provided in Appendix A. Our adapted AHP method incorporates these results as evidence provided to inform expert decision makers. It also enables ranking of priorities for alternative interventions that are considered to enhance quality of life, and it allows us to identify separately the relative utility (or value) of all the types of outcomes associated with such interventions.

Analytical Hierarchy Process

Applying AHP to Complex Policy Decisions Regarding Skill Formation and Human Capability Investment

Policy makers at all levels of government require multiple criteria to analyze complex problems (Manning, 2008). They can then make trade-offs between achievement on these various

criteria highlighting the advantages and disadvantages of different policy options under the veil of risk and uncertainty (Von Neumann and Morgenstern, 1944). For problems such as skill formation and human capability accumulation, trade-offs that serve the common interest are best analyzed via a process that allows for consensus building and compromise (Saaty, 1982). The advantages and disadvantages of using only individual knowledge and experience in decisions concerning welfare and quality of life have been well documented by Saaty. He has argued that the decision process should display five characteristics: "(1) simple to construct; (2) adaptable to both groups and individuals; (3) natural to our intuition and general knowledge; (4) encourage compromise and consensus building; and, (5) not require inordinate specialization to master and communicate" (Saaty, 1994: 20).

Decisions regarding human capability investment require answers to questions such as which outcomes are more important than others? How do we weight the often-conflicting aims of human capability investment programs? How do we rank these aims in terms of importance? How can we weight various outcome goals, and how do we bring about these outcomes? Such questions require multicriteria logic. We argue that in addition, empirical evidence (such as that derived from detailed meta-analysis) should be built into the decision-making framework. The AHP process is one method that can be used to assist with multicriteria policy decisions. A summary is provided in Figure 2 of the potential benefits of our adapted AHP method (highlighted by the shaded box). In particular, the adapted method generates relative utility values that can be incorporated directly into cost-utility analyses of various intervention alternatives.

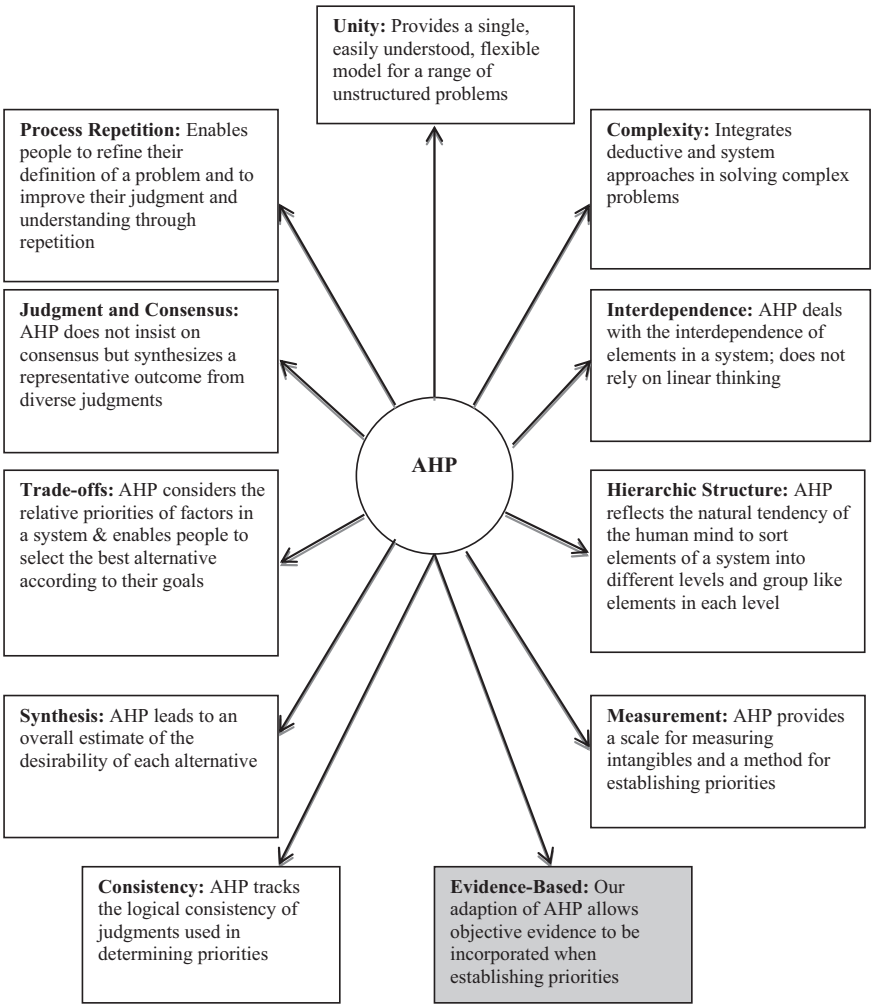
Brief Outline of AHP

The AHP approach provides a systematic procedure for representing the elements of a decision-making problem, rationally disaggregating the elements into constituent parts, and introducing simple pair-wise comparison judgments for use in developing a vector of weights for ranking alternatives (Saaty, 1980). Providing the expert group who will be asked to make these pairwise comparisons with results from a meta-analytic review of impacts derived from the empirical literature (Manning et al., 2010) has the benefit of allowing these experts to combine subjective elements (real-life experience and feelings) and objective (empirical evidence) elements in the decision-making process.

The AHP method has had extensive application. It has been particularly useful for guiding decisions relating to the allocation of resources (e.g., Chen and Li, 2001a, 2001b), planning (e.g., Crowe, Noble, and Machimada, 1997; Udo, 2000; Yang and Lee, 1997), impact of policy (e.g., Saaty, 1980, 2001), and resolving conflicts (e.g., Johannessen, Bandara, and Smith, 2004; Tarbell and Saaty, 1980). The method also is widely applied to corporate planning, portfolio selection, and cost–benefit analysis by government agencies for the purposes of resource allocation (Saaty, 2001).

FIGURE 2

Advantages of Our Adapted AHP Method

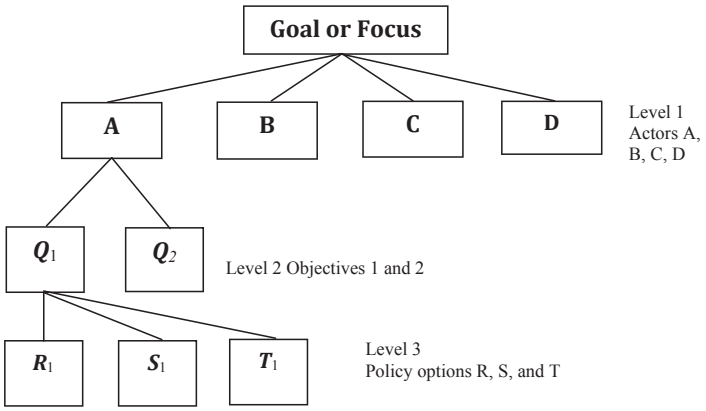


Notes. The analytic hierarchy process (AHP) is a structured technique for organizing and analyzing complex decisions. Firmly rooted in applied mathematics and psychology, AHP assists decision makers in finding solutions to complex problems (or a defined goal) through the use of a comprehensive and rational framework for structuring a decision problem. The methods allow for the representation and quantification of the defining **AHP** elements of a decision problem and for relating the elements to overall goals. The method therefore allows for the relative ranking or evaluation of alternative solutions to the problem/goal (Saaty, 1980).

Source. Adapted from Saaty (2001).

FIGURE 3

An Illustrative Hierarchy



Source. Manning (2008).

Brief Description of the AHP Method

The AHP method allows us to rank objectives in terms of their importance with respect to the overall goal or focus, as depicted in the illustrative hierarchy in Figure 3.

A hierarchical structure represents the relationships among the elements at the different levels within the hierarchy (Isard and Smith, 1982; Johannessen et al., 2004). The top of the hierarchy (Saaty, 1990) identifies the goal (e.g., the most preferred early childhood prevention program among a group of alternatives). The next level down (Level 1) represents the key actors involved in the decision; Level 2 represents the key objectives of each actor; and Level 3 provides the structures that may serve as policy options. More levels may be included in a hierarchy, depending on the problem being analyzed (e.g., complexity and number of objectives). Figure 3 shows that actors A, B, C, and D constitute Level 1; Level 2 represents each actor's objectives (Q_1 and Q_2); and Level 3 represents potential policy options (*R, S, T*).

A group of expert respondents is selected to assist in placing values or weights at each level of the hierarchy, taken in turn. For example, each respondent is prompted to compare the objectives q in Level 2 ($q = 1 \ldots . n$) in pairs in terms of their relative importance to the achievement of the goal. To compare objective i with objective j, we assign the values q_{ij} and q_{ji} such that if i is considered more important than j, then q_{ij} is assigned a number greater than unity based on Saaty's comparison scale (Table 1). Judgments are represented on a scale comprising integers from 1 to 9 and their reciprocals (Saaty, 1990, 2000).

This scale is employed to value judgments relating to all possible pairwise comparisons that are represented in a summary matrix Q of dimension $n \times n$ (Table 2). For example, the row related to objective 1 in Table 2 can be interpreted as follows: Comparing objective 1

TABLE 1

Saaty's Comparison Scale

Intensity of Importance	Definition	Explanation
1	Equal importance	Two elements are of equal importance
3	Weak importance	Experience and judgment slightly favor one element over another
5	Essential or strong importance	Experience and judgment strongly favor one element over another
7	Demonstrated or very strong importance	An element is strongly favored, and its dominance is demonstrated in practice
9	Absolute importance	The evidence favoring one element over another is of the highest possible affirmation
2,4,6,8	Intermediate values	When compromise is needed

Source. Adapted from Saaty (1990).

TABLE 2

Example of Pairwise Comparisons of Objectives ($q\downarrow 1$, $q\downarrow 2$, $q\downarrow 3$)

q_1	q_2	q_3
1	1/3	5
	1	7
		1

Source. Adapted from Saaty (1980).

to objective 1 gives a value of 1 indicating "equal importance"; comparing objective 1 and objective 3 gives a value of 5 indicating that objective 3 is considered to be of "essential or strong importance" compared with objective 1; and comparing objective 1 and objective 2 gives a value of 1/3 indicating that objective 1 is considered to be of "weak" importance compared with objective 2.

Based on the complexity of the decision, and on the number of levels present in the hierarchy, we develop several such pairwise comparison matrices. From each of these matrices, we can compute a normalized vector (Q*) of priorities (or relative importance[s]). This process involves (a) dividing the elements of each column of the matrix by the sum of that column (normalization of the column); (b) adding the elements in the rows; and (c) dividing this sum by the number of elements in the row (in this case 3). The corresponding elements in this column vector Q* sum to unity. The elements in this vector can thus be interpreted as the respondent's relative weights or priorities for the components of the hierarchy we are comparing.

It is important to check the consistency of respondents' pairwise comparisons. For example, we ask the respondent if he or she prefers q_2 to q_1; if q_2 has greater value than q_1,

we write $q_2 \hbar q_1$. If our respondent prefers q_1 to q_3, then we write $q_1 \hbar q_3$. As $q_2 \hbar q_1$ and $q_1 \hbar q_3$, logically $q_2 \hbar q_3$. This logic of preference is called a transitive property (Isard and Smith, 1982). If the last comparison is $q_2 \hbar q_3$, then the judgment is consistent. However, if $q_3 \hbar q_2$ then the underlying answers are inconsistent. However, 100% consistency is not required for the AHP method to be used (Saaty, 2000). Rather a consistency index (CI) is calculated for each pairwise comparison matrix.

This *CI* is evaluated to determine its acceptability for use in an AHP evaluation by comparing it with a random consistency index (*RI*) developed by Saaty (1980) to generate a consistency ratio *CR* test statistic calculated as CI/RI.

As suggested by Saaty, if the value of the *CR* is smaller or equal to a 10% tolerance band, then the level of inconsistency displayed by the respondent's answers is acceptable. Levels greater than 10% indicate that we may need to go back to respondents and ask them to reconsider and revise their pairwise comparisons. A full example use of the AHP approach for a three-level hierarchy such as the one depicted in Figures 3 and 4 is provided in Manning (2008) and in Manning, Smith, and Homel (2011).

Adapted AHP Method

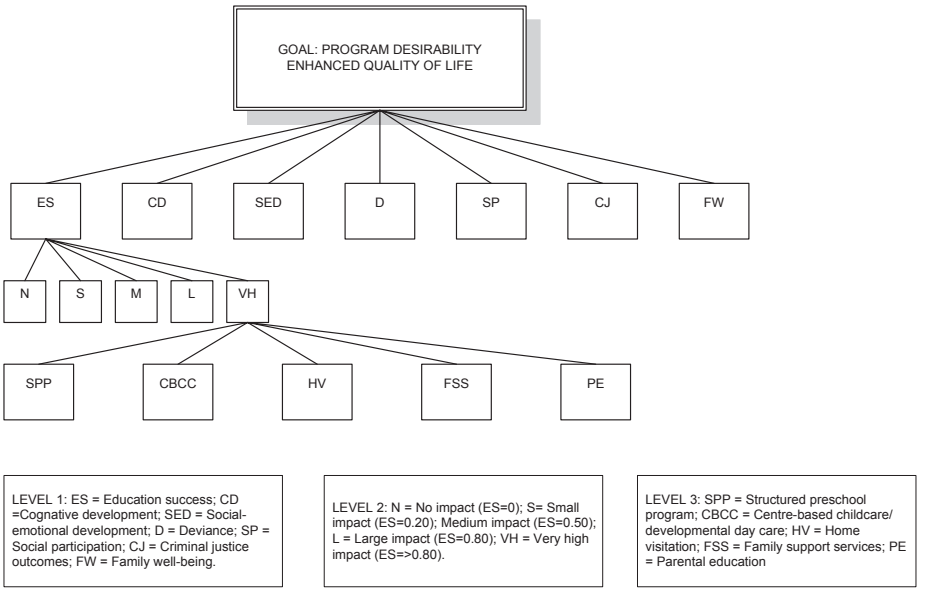
Our method determines, among the alternatives available, the developmental crime prevention program that is considered, by a sample of experts, to have the most potential to enhance quality-of-life outcomes (e.g., cognitive development and social-emotional development) and to reduce the probability of deviance and contact with the criminal justice system during adolescence. The individuals who populate the study and control groups of the prevention programs described in relevant longitudinal research are considered those most at risk of poor quality-of-life outcomes. Such individuals most commonly face risks in four major domains: (a) community[1]; (b) family[2]; (c) peers[3]; and (d) individual[4] (Durlak, 1998; Marshall and Watt, 1999; Pollard, Hawkins, and Arthur, 1999).

Five forms of early prevention programs are analyzed in this study: structured preschool programs (SPP); home visitation programs (HV); center based childcare/developmental day care (CBCC); family/parent support (FSS); and parent education programs (PE). A full description of these programs is provided in Manning (2008).

1. The broad domain of community risks is disaggregated into individuals living within a neighborhood that: is impoverished, has higher than average crime rates, has large rates of public housing, has limited social service facilities, and is culturally and linguistically diverse.
2. Characteristics of family risks include families with high levels of social and economic disadvantage (e.g., lower than average median weekly household income, low rates of high school completion by parents, higher than average rates of single-parent families and marital discord, punitive child-rearing practices, high unemployment, and socially isolated as a result of cultural and linguistic barriers).
3. Peer risks are disaggregated into negative peer pressure or modeling and possible peer rejection.
4. Individual risks include early learning difficulties and possible early behavior problems.

FIGURE 4

Decision Hierarchy for Human Capital Program Alternatives, Outcome Domains, and Level of Effect



Note. Level 2 highlights five possible intensity levels (no impact [N], small impact [S], medium impact [M], large impact [L], and very high impact [VH]).
Abbreviations. CBCC = center-based childcare/developmental day care; FSS = family/parenting support; HV = home visitation program; PE = parent education program; SPP = structured preschool program.
Source. Manning (2008).

Seven outcome domains for disadvantaged populations relating to the impact of these program types during adolescence are included: educational success (ES), cognitive development (CD), social-emotional development (SED), deviance (D), social participation (SP), criminal justice outcomes (CJ) and family well-being (FW). These outcome domains were selected as the focus for the meta-analysis after extensive consultation with academics from criminology, psychology, and economics. A full description of these domains is provided in Manning et al. (2010).

Respondents for the AHP survey were selected on the basis of (a) their ability to make decisions regarding the implementation of program options available for early prevention and/or (b) their demonstrated expertise and experience in evaluation of the short- and long-term effectiveness of existing early prevention programs. The selected participants came from four stakeholder groups: policy development personnel (e.g., representatives

of Queensland Department of Communities, Department of Child Safety, Queensland Health, Department of Education, Training and the Arts); preschool/school leaders (e.g., school principals, coordinators of childcare centers, and coordinators of crèches and kindergartens); senior community agencies staff (e.g., managers of nongovernmental organizations involved in community-based developmental prevention programs); and academics expert in developmental crime prevention and early childhood education (Manning, 2008). This methodology has the obvious limitation that the results derived from it are heavily dependent on, and can be influenced significantly by, the choice of the group of experts selected to provide us with responses to our AHP questions; therefore, we adopted a range of strategies to minimize the risks to the validity and generalizability of our findings. First, we cast our net widely for the selection of experts; second, we involved a steering group or expert panel to oversee our selection; third, we obtained our responses from selected experts in strict accordance with an approved human ethics protocol; and finally, we conducted a detailed sensitivity analysis of the results to ensure that they were not unduly influenced by the responses of particular individuals. Our sample included most of the key individuals involved in government policy development, academic research, and the policies and practices of community agencies in areas relevant to the research project within Queensland. Nevertheless, we regard the results of the survey as *illustrative* of the potential of the AHP method rather than as *definitive*. Funds permitting, we would seek to expand the sample size in the area of preschool/school leaders in a more exhaustive follow-up survey.

Data were collected by conducting two independent surveys. Survey 1 related to the importance of the seven outcome domains (ES, CD, SED, D, SP, CJ, and FW) with respect to their potential contribution to increased non–health-related quality of life during adolescence. Preferences among the outcomes were determined by developing a matrix that compared the various outcomes in pairs. We asked participants to express preferences among the intensities of the seven outcomes by developing seven matrices that compared in pairs five outcome levels of success (no impact, small impact, medium impact, large impact, and very high impact) with respect to each outcome. The overall goal was to develop a weighted vector of priorities for program desirability with respect to the most desired outcome intensities. Members of the government policy development group and the academic group were selected to complete Survey 1 because we expected that they could make the most informed choices based on their expert knowledge of adolescent outcomes associated with developmental crime prevention programs, particularly early-in-life interventions. Furthermore, it was recognized that this group could make expert choices based on its ability to interpret objective results from longitudinal evaluation research, so it was presented with data derived from the meta-analysis conducted by the authors on the effects of early prevention programs on the seven outcome domains during adolescence (Manning et al., 2010).

Survey 2 aimed to determine the perceived relative contributions of the five early childhood program types (SPP, HV, CBCC, FSS, and PE) with respect to the most desired

outcome and intensity combinations derived from Survey 1. Survey 2 was administered to the school-preschool group and the community agencies group. These participants also were presented with an explanation of the data from the meta-analysis. The decision hierarchy developed for this study is provided in Figure 4.

The top of the hierarchy represents the overall goal, which is program desirability based on contribution to increasing quality of life and reducing the probability of deviance and contact with the criminal justice system during adolescence. Level 1 represents the domains considered important to achieving the goal (e.g., ES educational success and CD cognitive development). Level 2 highlights five possible intensity levels (no impact [N], small impact [S], medium impact [M], large impact [L], and very high impact [VH]), which may be associated with the various domains in Level 1. These intensity levels are derived from Cohen (1992).[5] Level 3 provides the various early prevention program options (CBCC, SPP, HV, FSS, and PE).

The benefit of this structure is that it allows one to make judgments on the relative importance of each outcome domain and on the relative importance of their intensity levels, and ultimately to determine the relative importance or desirability of each possible program option.

Results of the Adapted AHP Method

Survey 1 consisted of two parts. Part 1 comprised questions about the relative contribution of the seven outcomes to increasing non–health-related quality of life during adolescence. The relative priority vector derived from and shown on the right-hand side of the pairwise comparisons matrix in Table 3 demonstrates that the outcome FW (family well-being) was considered to have the highest priority or level of importance (0.330), followed in order of priority by social-emotional development (SED 0.161) and the other outcomes: SP (0.144), CJ, D, ES, and CD.

Table 3 suggests that objective research from the meta-analysis did not greatly influence perceived preferences for outcomes because the priority weightings were roughly the reverse of the meta-evaluation effect sizes for the seven outcome domains in Figure 1. Several probable reasons for this exist. First, respondents may have acknowledged that some of the programs were initially developed with a narrow focus on domains such as educational success (ES) and cognitive development (CD). Second, had the meta-analytic findings on the outcome domain family well-being (FW) not been as limited in terms of the number of longitudinal studies, a much larger weighted mean effect size may have been

5. A detailed discussion of Cohen's effect sizes is provided in Manning (2008). It is well recognized that Cohen's small–medium–large criteria are misleading, particularly in this field. One should note that Cohen's *d* is approximately twice the fractional reduction in offending or recidivism in a 2 × 2 table. For example, $d = 0.2$ could correspond to a 55% recidivism in a control group versus 45% in a treatment group (18.2% reduction in recidivism). This effect is obviously not small. As such, one should convert *d* values into percentage reductions in an outcome to gain a more illuminating picture of the true effect.

TABLE 3

Pairwise Comparison of Adolescent Outcomes (Average Response)

	ES	CD	SED	D	SP	CJ	FW	
ES	1.00	0.79	0.30	0.52	1.08	0.89	0.28	**ES** 0.078
CD	1.27 (1.42)	1.00	0.28	0.42	0.58	0.39	0.26	**CD** 0.063
SED	3.33 (2.36)	3.55 (2.43)	1.00	0.84	0.70	1.02	0.78	**SED** 0.161
D	1.92 (2.44)	2.36 (3.10)	1.19 (1.90)	1.00	0.37	0.99	0.23	**D** 0.113
SP	0.93 (1.46)	1.73 (1.90)	1.43 (1.73)	2.71 (2.38)	1.00	1.19	0.28	**SP** 0.144
CJ	1.12 (1.92)	2.54 (2.50)	0.98 (1.20)	1.01 (1.11)	0.84 (1.14)	1.00	0.29	**CJ** 0.112
FW	3.63 (2.63)	3.90 (1.60)	1.27 (1.05)	4.43 (2.09)	3.55 (2.34)	3.46 (2.42)	1.00	**FW** 0.330

Note. Figures in parentheses represent the standard deviation across respondents.

Source. Manning (2008).

demonstrated. Third, as MacLeod and Nelson (2000); Nelson, Laurendeau, Chamberland, and Peirson (2001); Weissberg and Greenberg (1998); Yoshikawa (1994); and Zigler, Taussig, and Black (1992) argued, multicomponent programs in early childhood have more benefits than single program types for children's social-emotional, educational, and cognitive development and for improvements in family well-being. Therefore respondents may have been persuaded by current research (Brooks-Gunn, Fuligni, and Berlin, 2003; Homel et al., 2006) that has highlighted the importance of focusing not only on the vulnerable child's school environment but also on his or her home environment.

Part 2 of Survey 1 comprised questions relating to preferences among the intensities of the outcomes. Seven matrices were developed comparing five intensity levels of success with respect to each of the seven outcomes. Results demonstrated, not surprisingly, that respondents considered a very high effect (VH) most important when selecting a program based on its potential impact, and the outcomes FW (VH-FW) (0.416) and SED (VH-SED) (0.151) were considered the highest priority. This prioritization was followed in order of priority by the outcomes VH-SP (0.115), VH-CJ (0.109), VH-D (0.094), VH-ES (0.067), and VH-CD (0.048).

Although a very large effect (VH) on each outcome was considered to be the most important when selecting a program, it does not follow that a lower effect size is of no importance. A close examination of results highlights that participants chose a VH effect size as an ideal potential outcome rather than necessarily a specific criterion for inclusion for potential funding. We suspect that a trade-off between intensity levels of success will probably not occur until each respondent compares the cost of achieving higher and lower levels of effect. Table 4 provides a hypothetical example, where the cost-effectiveness of implementing a program that might achieve large effects (L) on a set of outcomes is almost double that of a program with an anticipated medium effect (M), and almost three times that of funding a program that has the potential to achieve a small effect (S).

TABLE 4

Hypothetical Cost-Effectiveness Scenario: Comparing the Cost-Effectiveness of Three Levels of Effect (very high [VH] effect, medium [M], and small [S] effect)

	Preschool Program Alternative 1 (VH-effect)	Preschool Program Alternative 2 (M-effect)	Preschool Program Alternative 3 (S-effect)
Average cost per participant	$65,202.30	$32,320.10	$17,413.00
Overall effectiveness	70.2	60.0	55.0
Cost-effectiveness ratio	$928.81	$538.66	$316.60

Note. The cost-effectiveness ratio (row 3) is calculated as average cost (row 1) divided by overall effectiveness (row 2).

Ideally, we would strive to implement programs that have a VH effect on a given set of outcomes. However, when a policy maker is faced with the gamble of funding a program that has a high probability of achieving a small (S) to medium (M) effect on a given set of outcomes with a program that has a lower probability of achieving a VH effect, a trade-off is likely to occur, particularly when costs are incorporated into the decision. This decision of course will depend on the desired outcomes and the level of importance that the decision maker attaches to each outcome. Moreover, policy makers face the ethical dilemma of choosing between providing a potentially high impact program for a small number of children or funding a program that could potentially have a medium effect on a larger population of children. Rose (1992) conceptualized this notion as *the prevention paradox*—where, in terms of a reduction in disease at the population level, a small effect on a large number of people at low risk may be more beneficial overall than a big effect on a small number of people at high risk.

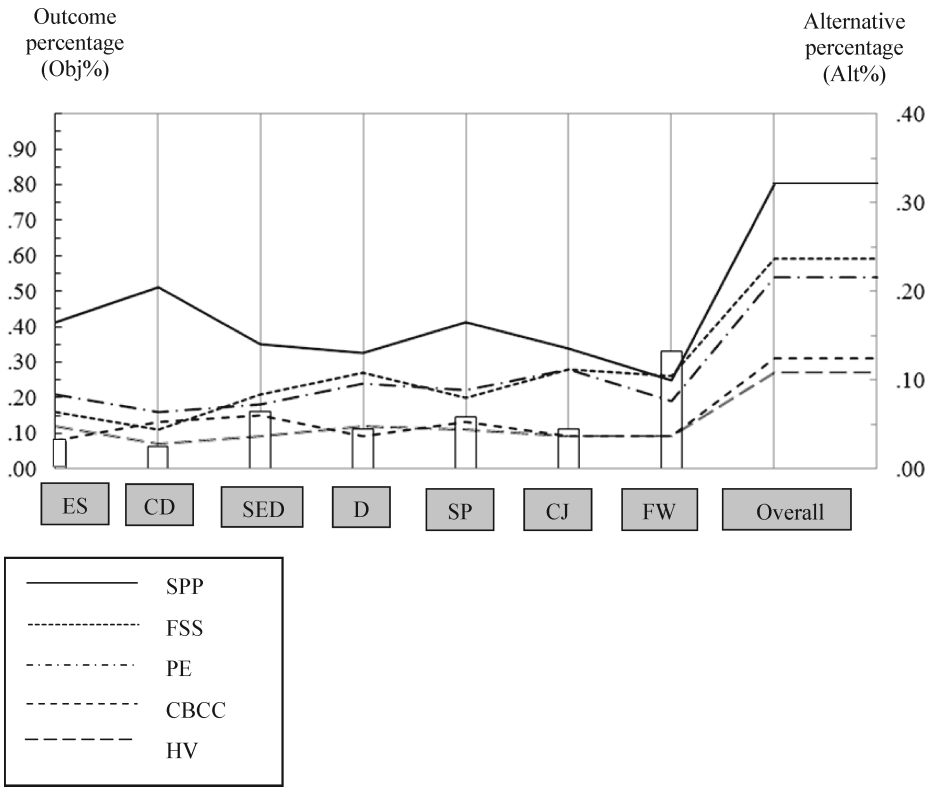
Survey 2 determined the perceived preferences for developmental crime prevention programs by developing seven matrices that compared the five program options in pairs, with respect to the most desired outcome/level of success (VH-ES, VH-CD, VH-SED, VH-D, VH-SP, VH-CJ, and VH-FW). The results of this survey highlighted that the structured preschool program (SPP) was considered the highest priority (0.320) with respect to contributing to a VH effect on all outcomes during adolescence. This was followed in order of priority by the programs FSS (0.240), PE (0.216), CBCC (0.116), and HV (0.107).

Using the software Expert Choice (Expert Choice, 2000–2004), the level of inconsistency for the hierarchy was 0.06. This level is considered acceptable because it demonstrates that choices made by respondents were overall relatively consistent, in the sense that they collectively generated a transitive ordering of preferences.

Figure 5 combines the results of the priority rankings from Surveys 1 and 2. The vector of priorities derived from outcome objectives (ES, CD, SED, D, SP, CJ, and FW) are provided on the *X*-axis (represented by vertical bars). The overall outcome percentage is provided on the left-hand *Y*-axis, which ranges from 0.00 to 0.90. Program alternatives

FIGURE 5

Overall Performance Graph for Hierarchy



Source. Manning (2008)

(SPP, CBCC, HV, FS, and PE) are provided on the right-hand *Y*-axis, together with the alternative priority percentage, which ranges from 0.00 to 0.40. Overall rankings of program alternatives can be read from the right-hand *Y*-axis. The colored lines represent the overall contribution made by the outcomes, in terms of their percentage of priority weighting, to each prevention program alternative.

Focusing first on the right-hand *Y*-axis, Figure 5 demonstrates that the program alternative structured preschool program SPP rated the highest (32%). Then the order of percentage priority by the program alternatives is as follows: family support services FSS (24%), parental education PE (21.6%), center-based developmental day care CBCC (11.6%), and home visitation HV (10.7%). Looking next at the vertical bars, the outcome family well-being FW was rated the highest with respect to its potential contribution to improving quality of life during adolescence (33% of total priority), followed in order of priority by the outcomes social-emotional development SED (16.1%), social participation SP (14.4%), deviance D

(11.3%), criminal justice contact CJ (11.2%), educational success ES (7.8%), and cognitive development CD (6.3%). Indicators of family well-being, the highest rated outcome domain, include strength of familial relationships, level of unity, and overall improved functioning within the family (Children's Home Society and Family Services, 2007).

Figure 5 also allows us to identify which outcomes contributed the most to the percentage priority rankings of the five program alternatives; this is represented by the patterned lines showing the overall contribution made by non–health-related outcomes, in terms of their percentage of priority, to each program alternative. The patterned lines demonstrate a large gap between the outcomes ES, CD, SED, and SP, whereby the solid line (representing SPP) lies above all the dashed lines by a large margin. This figure shows us that SPP received large priority percentage ratings with respect to the outcomes ES, CD, SED, and SP compared with other forms of prevention. In contrast, the CBCC and HV lines lie significantly above the other lines with regard to deviance (D) and criminal justice outcomes (CJ). Thus, the outcomes D and CJ received low priority percentage rankings with respect to their overall contribution to the program alternatives CBCC and HV. Consequently, these outcomes influenced the overall percentage of priority rankings for CBCC and HV with respect to the program alternatives SPP, FSS, and PE.

Sensitivity analyses were conducted to measure the responsiveness of the results to changes in the relative importance of outcome objectives. These analyses demonstrated that results were stable (Manning, 2008).

Conclusion

This study has illustrated how multicriteria analysis can be used to rank developmental crime prevention programs. We have argued that crime prevention policy has been formulated for too long without a structured method for carefully assessing the benefits across multiple domains and across diverse policy options, and for incorporating evidence from past experience with such policy options into the method in a meaningful way. A structured method is essential because limitations to human cognitive capacity restrict our ability to capture all the salient information, particularly if one wishes to incorporate multiple domains and the results of a meta-analysis of past experience into the decision-making framework.

The adapted method we have presented and tested in this study provides for better policy decisions by (a) evaluating program alternatives with respect to priority rankings made by experts in the field; and (b) eliciting individual relative utility values for use in cost-utility analyses of such alternatives. Capturing relative utilities is important as it makes possible an economic approach that values improvements in quality of life resulting from developmental crime prevention programs. The outcome domains associated with these improvements are broader, in general, than those incorporated in traditional cost–benefit analysis because our adapted method does not require that attention be restricted to those outcome domains that are readily monetized. In addition, the adapted method can be used to identify a set of common metric outcomes across competing and often disparate program

alternatives so that decisions can be made that incorporate both the stakeholder perspective and a more holistic individual perspective. Consequently, the approach we have proposed can contribute to a better understanding of the impact of human capability development programs on the most vulnerable children and families.

Nevertheless it should be acknowledged that, as with all methods of policy evaluation, there are weaknesses associated with the AHP approach. These weaknesses include the issue of rank reversal and hierarchy composition, the axiomatic foundations of the approach, the degree of ambiguity in the questions asked of respondents, the possible selection bias around choice of respondents, and the scale used to measure the intensity of preferences. Detailed discussions of these weaknesses may be found in Harker and Vargas (1987, 1990), McCaffrey (2005), Manning (2008), and Warren (2004).

The methods proposed in this article could be improved if developmental crime prevention programs incorporated other relevant indicators for the seven outcome domains, especially aspects of family well-being that were so highly valued by respondents in the present study. Elements such as length and intensity of programs, the use of follow-up programs, multicomponent programs, and multicontextual programs also could be incorporated. Additionally, future research could expand the survey participant base to incorporate national and international perspectives.

Finally, the adapted method developed in this study could be used to evaluate crime prevention policy options being considered for adoption in other areas. For example, see Manning, Ransley, Smith, Mazerolle, and Cook (2013) for an application of the method in developing policy for controlling access to illegal precursor chemicals in the production of methamphetamine. The method also could be used with profit to evaluate the kinds of widely used "no name" youth offender treatment programs proposed by Lipsey and Howell (2012) as evidence-based alternatives to the "model programs" that are at the center of current efforts to transform science into service (Fixsen, Blase, Naoom, and Wallace, 2009; Smith, Gendrea, and Swartz, 2009) as well as the alternative rehabilitation treatment programs advocated by leaders in the principles of effective intervention literature (e.g., Gendreau, 1996; Lowenkamp, Latessa, and Smith, 2006; Smith et al., 2009).

References

Aos, Steve, Polly Phipps, Robert Barnoski, and Roxanne Lieb. 2001. The comparative costs and benefits of programs to reduce crime: A review of research findings with implications for Washington State. In (Brandon Welsh, David Farrington, and Lawrence Sherman, eds.), *Costs and Benefits of Preventing Crime.* Boulder, CO: Westview Press.

Belfield, Clive R., Milagros Nores, Steve W. Barnett, and Lawrence J. Schweinhart. 2006. The High/Scope Perry Preschool Program: Cost-benefit analysis using data from the age-40 followup. *Journal of Human Resources*, 41:162–190.

Berrueta-Clement, John R., Lawrence J. Schweinhart, Steve W. Barnett, Ann S. Epstein, and David P. Weikart. 1984. *Changes Lives: The Effects of the Perry Preschool Program on Youths through Age 19.* Ypsilanti, MI: High/Scope Educational Research Foundation.

Boardman, Anthony E., David H. Greenberg, Adrian R. Vining, and David L. Weimer. 2001. *Cost-benefit Analysis: Concepts and Practice*, 2nd Edition. Upper Saddle River, NJ: Prentice-Hall.

Brooks-Gunn, Jeanne, Alison S. Fuligni, and Lisa J. Berlin. 2003. *Early Child Development in the 21st Century: Profiles of Current Research Initiatives.* London, U.K.: Teachers College Press.

Campbell, Frances A. and Craig T. Ramey. 1994. Effects of early intervention on intellectual and academic achievement: A follow-up study of children from low-income families. *Child Development*, 65: 684–698.

Campbell, Frances A. and Craig T. Ramey. 1995. Cognitive and school outcomes for high-risk African-American students at middle adolescence: Positive effects of early intervention. *American Educational Research Journal*, 32: 743–772.

Campbell, Frances A., Craig T. Ramey, Elizabeth Pungello, Joseph Sparling, and Shari Miller-Johnson. 2002. Early childhood education: Young adult outcomes from the Abecedarian Project. *Applied Developmental Science*, 6: 42–57.

Carneiro, Pedro and James Heckman. 2003. Human capital policy. In (J. Heckman, A. Krueger, and B. Friedman, eds.), *Inequality in America.* Cambridge, MA: MIT Press.

Chen, Eddie W. L. and Heng Li. 2001a. Analytical hierarchy process: An approach to determine measures for business performance. *Measuring Business Excellence*, 5: 30–36.

Chen, Eddie W. L. and Heng Li. 2001b. Information priority-setting for better resource allocation using analytic hierarchy process (AHP). *Information Management & Computer Security*, 9: 61–70.

Children's Home Society and Family Services. 2007. Child and family support services. Retrieved April 20, 2007 from chsfs.org/Child_Family_Support_Services.html.

Cohen, Jacob. 1992. Quantitative methods in psychology: A power primer. *Psychological Bulletin*, 112: 155–159.

Cohen, Mark, Roland Rust, Sara Steen, and Simon Tidd. 2004. Willingness-to-pay for crime control programs. *Criminology*, 42: 89–109.

Crowe, Thomas J., James S. Noble, and Jeevan S. Machimada. 1997. Multi-attribute analysis of the ISO 9000 registration using AHP. *International Journal of Quality & Reliability Management*, 15: 205–222.

Durlak, Joseph. 1998. Common risk and protective factors in successful prevention programs. *American Journal of Orthopsychiatry*, 68: 512–520.

Eckenrode, John, Barbara Ganzel, Charles R. Henderson, Elliot Smith, David Olds, Jane Powers, Robert Cole, Harriet Kitzman, and Kimberley Sidora. 2000. *Preventing Child Abuse and Neglect with a Program of Nurse Home Visitation*, 284: 1385–1391.

Elliott, Delbert and Scott Menard. 1996. Delinquent friends and delinquent behaviour: Temporal and developmental patterns. In (J. David Hawkins, ed.), *Delinquency and Crime.* Cambridge, U.K.: Cambridge University Press.

Expert Choice. 2000–2004. *Expert Choice Inc.*, Arlington, VA: Author.

Farrington, David. 1995. The twelfth Jack Tizard Memorial Lecture: The development of offending and antisocial behaviour from childhood: Key findings from the Cambridge

Study in delinquent development. *The Journal of Child Psychology and Psychiatry*, 36: 929–964.

Fixsen, Dean L., Karen A. Blase, Sandra F. Naoom, and Frances Wallace. 2009. Core implementation components. *Research on Social Work Practice*, 19: 531–540.

Gendreau, Paul. 1996. The principles of effective interventions with offenders. In (Alan Harland, ed.), *Choosing Correctional Options That Work: Defining the Demand and Evaluating the Supply.* Thousand Oaks, CA: Sage.

Gold, Marthe R., Donald L. Patrick, George W. Torrance, Dennis G. Fryback, David C. Hadorn, Mark S. Kamlet, Norman Daniels, and Milton C. Weinstein. 1996. Identifying and valuing outcomes. In (Marthe R. Gold, Joanna E. Siegel, Louise B. Russell, and Milton C. Weinstein, eds.), *Cost-effectiveness in Health and Medicine.* New York: Oxford University Press.

Gray, Susan W. and Rupert A. Klaus. 1970. The Early Training Project: A seventh-year report. *Child Development*, 41: 909–924.

Greenwood, Peter, Karyn Model, C. Peter Rydell, and James Chiesa. 1996. *Diverting Children from a Life of Crime: Measuring Costs and Benefits.* Santa Monica, CA: RAND.

Harker, Patrick T. and Luis G. Vargas. 1987. The theory of ratio estimation: Saaty's analytic hierarchy process. *Management Science*, 33: 1383–1404.

Harker, Patrick T. and Luis G. Vargas. 1990. Reply to "Remarks on the analytic hierarchy process" by J.S. Dyer. *Management Science*, 36(3), 269–273.

Heckman, James. 2000. Policies to foster human capital. *Research in Economics*, 54: 3–56.

Heckman, James. 2006. Skill formation and the economics of investing in disadvantaged children. *Science*, 312: 1900–1902.

Heckman, James, Seong H. Moon, Rodrigo Pinto, Peter Savelyev, and Adam Yavitz. 2010. *A New Cost Benefit and Rate of Return Analysis for the Perry Preschool Program: A Summary.* Cambridge, MA: National Bureau of Economic Research.

Homel, Ross, Kate Freiberg, Cherie Lamb, Marie Leech, Angela Carr, Anne Hampshire, Ian Hay, Gordon Elias, Matthew Manning, Rosie Teague, and Sam Batchelor. 2006. *The Pathways to Prevention Project: The First Five Years 1999–2004.* Brisbane: Griffith University and Mission Australia.

Isard, Walter and Christine Smith. 1982. *Conflict Analysis and Practical Conflict Management: An Introduction to Peace Science.* Cambridge, MA: Ballinger.

Johannessen, Preben, Jayatilleke S. Bandara, and Christine Smith. 2004. An analysis of the Sri Lankan conflict using an economic tool. *Economic Analysis and Policy*, 33: 163–188.

Johnson, Dale L. 2006. Parent-Child Development Center follow-up project: Child behavior problem results. *The Journal of Primary Prevention*, 27: 391–407.

Johnson, Dale L. and Janet Blumenthal. 2004. The Parent Child Development Centers and school achievement. *The Journal of Primary Prevention*, 25: 195–209.

Karoly, Lynn, Peter Greenwood, Susan Everingham, Jill Hoube, Rebecca Kilburn, Peter Rydell, Matthew Sanders, and James Chiesa. 1998. *Investing in Our Children: What We Know and Don't Know about the Costs and Benefits of Early Childhood Interventions.* Santa Monica, CA: RAND.

Karoly, Lynn, Rebecca Kilburn, James Bigelow, Jonathan Caulkins, and Jill Cannon. 2001. *Assessing Costs and Benefits of Early Childhood Intervention Programs: Overview and Application to the Starting Early Starting Smart Program.* Seattle, WA: Casey Family Programs.

Lally, J. Ronald, Peter L. Mangione, and Alice S. Honig. 1988. The Syracuse University Family Development Research Program: Long-range impact on an early intervention with low-income children and their families. In (Douglas R. Powell, ed.), *Parent Education as Early Childhood Intervention: Emerging Directions in Theory, Research and Practice.* Norwood, NJ: Ablex.

Larzelere, Robert and Gerald Patterson. 1990. Parental management: Mediator of the effect of socioeconomic status on early delinquency. *Criminology*, 28: 301–323.

Lazar, Irving, Richard Darlington, Harry Murray, Jacqueline Royce, Ann Snipper, and Craig T. Ramey. 1982. Lasting effects of early education: A report from the Consortium for Longitudinal Studies. *Monographs of the Society for Research in Child Development*, 47: 1–151.

Lee, Stephanie, Steve Aos, Elizabeth Drake, Annie Pennucci, Marna Miller, and Laurie Anderson. 2012. *Return on Investment: Evidence-based Options to Improve Statewide Outcomes.* Olympia: Washington State Institute for Public Policy.

Levenstein, Phyllis, Susan Levenstein, James A. Shiminski, and Judith E. Stolzberg. 1998. Long-term impact of a verbal interaction program for at-risk toddlers: An exploratory study of high school outcomes in a replication of the Mother-Child Home Program. *Journal of Applied Developmental Psychology*, 19: 267–285.

Levin, Henry M. and Patrick J. McEwan. 2001. *Cost-effectiveness Analysis.* 2nd Edition. London, U.K.: Sage.

Lipsey and Howell. 2012. A broader view of evidence-based programs reveals more options for state juvenile justice systems. *Criminology and Public Policy*, 11: 515–523.

Lowenkamp, Christopher T., Edward Latessa, and Paula Smith. 2006. Does correctional program quality really matter? The impact of adhering to the principles of effective intervention. *Criminology & Public Policy*, 5: 575–594.

MacLeod, Jennifer and Geoffrey Nelson. 2000. Programs for the promotion of family wellness and the prevention of child maltreatment: A meta-analytic review. *Child Abuse & Neglect*, 24: 1127–1149.

Mandel, Michael, Paul Magnusson, James Ellis, Gail DeGeorge, and Keith Alexander. 1993. The economics of crime. *Business Week*. December 13, 72–75.

Manning, Matthew. 2008. *Economic Evaluation of the Effects of Early Childhood Intervention on Adolescent Outcomes*. Ph.D. dissertation, Key Centre for Ethics, Law, Justice and Governance, Griffith University, Brisbane, Australia.

Manning, Matthew, Ross Homel, and Christine Smith. 2006. Economic evaluation of a community-based early intervention program implemented in a disadvantaged urban area of Queensland. *Economic Analysis and Policy*, 36: 99–120.

Manning, Matthew, Ross Homel, and Christine Smith. 2010. A meta-analysis of the effects of early developmental prevention programs in at-risk populations on non-health outcomes in adolescence. *Children and Youth Services Review*, 32: 506–519.

Manning, Matthew, Janet Ransley, Christine Smith, Lorraine Mazerolle, and Alana Cook. 2013. Policing methamphetamine problems: A framework for synthesising expert opinion and evaluating alternative policy options. *Journal of Public Policy*.

Manning, Matthew, Christine Smith, and Ross Homel. 2011. An economic method for formulating better policies for child development. *Australian Review of Public Affairs*, 10: 61–77.

Marshall, Jann and Paula Watt. 1999. *Child Behaviour Problems: A Literature Review of the Size and Nature of the Problem and Prevention Interventions in Childhood.* Perth, Western Australia: The Interagency Committee on Children's Futures.

McCaffrey, James. 2005. Test run: The analytical hierarchy process. *MSDN Magazine*. Retrieved July 31, 2013 from msdn.microsoft.com/en-us/magazine/cc163785.aspx.

Mendoza, Guillermo and Phil Macoun. 1999. *Guidelines for Applying Multi-criteria Analysis to the Assessment of Criteria and Indicators. Bogor,* Indonesia: Centre for International Forestry Research (CIFOR).

Meyer, Linda A. 1984. Long-term academic effects of the Direct Instruction Project Follow Through. *The Elementary School Journal*, 84: 380–394.

Miller, Louise and Rhondeall P. Bizzell. 1983. Long-term effects of four preschool programs: Sixth, seventh, and eighth grades. *Child Development*, 54: 727–741.

Nagin, Daniel. 2001. Measuring the economic benefits of developmental prevention programs. In (Michael Tonry, ed.), *Crime and Jusice: A Review of Research.* Chicago, IL: The University of Chicago Press.

National Science Foundation. 1994. *Investing in Human Resources.* Arlington, VA: Author.

Nelson, Geoffrey, Marie-Claire Laurendeau, Claire Chamberland, and Leslea Peirson. 2001. A review and analysis of programs to promote family wellness and prevent the maltreatment of preschool and elementary school aged children. In (Isaac Prilleltensky, Geoffrey Nelson, and Leslea Peirson, eds.), *Promoting Family Wellness and Preventing Child Maltreatment: Fundamentals for Thinking and Action.* Toronto, Ontario, Canada: University of Toronto Press.

Olds, Dennis, Charles R. Henderson, Robert Cole, John Eckenrode, Harriet Kitzman, Dennis Luckey, Lisa Pettitt, Kimberley Sidora, Pamela Morris, and Jane Powers. 1998. Long-term effects of nurse home visitation on children's criminal and antisocial behaviour. *Journal of the American Medical Association*, 280: 1238–1244.

Olds, Dennis, Charles R. Henderson, Charles Phelps, Harriet Kitzman, and Carole Hanks. 1993. Effects of prenatal and infancy nurse home visitation on government spending. *Medical Care*, 31: 155–174.

Pollard, John, J. David Hawkins, and Michael Arthur. 1999. Risk and protection: Are both necessary to understand diverse behavioural outcomes in adolescence? *Social Work Research*, 23: 145–158.

Reynolds, Arthur. J. 1994. Effects of a preschool plus follow-on intervention for children at-risk. *Developmental Psychology*, 30: 787–804.

Reynolds, Arthur J., Suh-Ruu Ou, and Joshua Topitzes. 2004. Paths of effects of early childhood intervention on educational attainment and delinquency: A confirmatory analysis of the Chicago Child-Parent Centers. *Child Development*, 75: 1299–1328.

Reynolds, Arthur J., Judy A. Temple, Dylan L Robertson, and Emily A Mann. 2001. Long-term effects of an early childhood intervention on educational achievement and juvenile arrest: A 15 year follow-up of low income children in public school. *Journal of the American Medical Association*, 285: 2339–2346.

Reynolds, Arthur, Judy A. Temple, Barry White, Suh-Ruu Ou, and Dylan Robertson. 2011. Age 26 cost-benefit of the Child-Parent Center Early Education Program. *Child Development*, 82: 379–404.

Reynolds, Arthur, Margaret Wang, and Herbert Walberg. 2003. *Early Childhood Programs for a New Century.* Washington, DC: Child Welfare League of America Press.

Rolnick, Arthur and Rob Grunewald. 2003. *Early Childhood Development: Economic Development with a High Public Return.* Minneapolis, MN: Federal Reserve Bank of Minneapolis.

Rose, Geoffrey. 1992. *The Strategy of Preventive Medicine.* Oxford, U.K.: Oxford University Press.

Saaty, Thomas L. 1980. *The Analytic Hierarchy Process.* New York: McGraw-Hill.

Saaty, Thomas L. 1982. How to make a decision: The analytic hierarchy process. *Interfaces*, 24: 19–43.

Saaty, Thomas L. 1990. *Multicriteria Decision Making: The Analytical Hierarchy Process.* Pittsburgh, PA: RWS.

Saaty, Thomas L. 1994. How to make a decision: The analytic hierarchy process. *Interfaces*, 24: 19–43.

Saaty, Thomas L. 2000. *Fundamentals of Decision Making and Priority Theory.* 2nd Edition. Pittsburgh, PA: RWS.

Saaty, Thomas L. 2001. *Decision Making for Leaders.* 3rd Edition. Pittsburgh, PA: RWS.

Sen, Amartya and Martha Nussbaum. 1996. Functioning and capability: The foundation of Sen's and Nussbaum's development of ethic. *Political Theory*, 24: 584–612.

Smith, Paula, Paul Gendrea, and Kristen Swartz. 2009. Validating the principles of effective intervention: A systematic review of the contributions of meta-analysis in the field of corrections. *Victims & Offenders: An International Journal of Evidence-Based Research, Policy, and Practice*, 4: 148–169.

Sprigle, Joan E. and Lynn Schaefer. 1985. Longitudinal evaluation of the effects of two compensatory preschool programs on fourth- through sixth-grade students. *Developmental Psychology*, 21: 702–708.

Tarbell, David S. and Thomas L. Saaty. 1980. The conflict in South Africa. *Journal of Peace Science*, 4: 151–168.

Udo, Godwin G. 2000. Using analytical hierarchy process to analyze the information technology outsourcing decision. *Industrial Management & Data Systems*, 100: 421–429.

Vitaro, Frank, Edward Barker, Mara Brendgen, and Richard Tremblay. 2011. Pathways explaining the reduction of adult criminal behaviour by a randomized preventive intervention for disruptive kindergarten children. *The Journal of Child Psychology and Psychiatry*, 53: 748–756.

Von Neumann, John and Oscar Morgenstern. 1944. *Theory of Games and Economic Behavior.* Princeton, NJ: Princeton University Press.

Warren, Lewis. 2004. *Uncertainties in the Analytic Hierarchy Process*. Edinburgh, South Australia: Defence Science and Technology Organisation.

Weissberg, Roger P. and Mark T. Greenberg. 1998. School and community competence-enhancement and prevention programs. In (William Damon, Irving E. Sigel, and K. Ann Renninger, eds.), *Handbook of Child Psychology.* New York: Wiley.

Welsh, Brandon and David Farrington. 2001. Assessing the economic costs and benefits of crime prevention. In (Brandon Welsh, David Farrington, and Lawrence Sherman, eds.), *Costs and Benefits of Preventing Crime*. Boulder, CO: Westview Press.

Welsh, Brandon, David Farrington, and Lawrence Sherman, eds. 2001. *Costs and Benefits of Preventing Crime.* Boulder, CO: Westview Press.

Wise, Sarah, Lisa da Silva, Elizabeth Webster, and Ann Sanson. 2005. *The Efficacy of Early Childhood Interventions.* Canberra, ACT: Australian Institute of Family Studies.

Yang, Jiaquin and Huei Lee. 1997. An AHP decision model for facility location selection. *Facilities*, 15: 241–254.

Yoshikawa, Hirokazu. 1994. Prevention as cumulative protection: Effects of early family support and education on chronic delinquency and its risks. *Psychological Bulletin*, 115: 28–54.

Zigler, Edward, Cara Taussig, and Kathryn Black. 1992. Early childhood intervention: A promising preventative for juvenile delinquency. *American Psychologist*, 47: 997–1006.

APPENDIX A

Effect Sizes *d*, Range *d*, and Mean *d*, Corrected for Small Sample Size, for the Seven Outcome Domains During Adolescence

Program + (Age at Follow-up)	Component (Major Component)	Effect Size
Abecedarian Project	CBCC (SPP)	ES ($d = 0.44$); CD ($d = 0.47$); D ($d = 0.49$); SED ($d = 0.43$); CJ ($d = 0.21$)
(20 Yrs) – Campbell, Ramey, Pungello, Sparling, and Miller-Johnson (2002)	Preschool (5 years) vs. no preschool control	
Abecedarian Project (15 Yrs) – Campbell and Ramey (1995)	CBCC; (SPP)	CD ($d = 0.74$)
	Preschool (5 years) vs. no preschool control	
Abecedarian Project (15 Yrs) – Campbell and Ramey (1995)	CBCC (SPP)	ES ($d = 0.69$); CD ($d = 0.59$)
	8 years of intervention – (5 yrs from infancy to kindergarten and 3 years in primary grades) vs. control	
Abecedarian Project	CBCC (SPP)	ES ($d = 0.79$); CD ($d = 0.40$)
(12 Yrs) – Campbell and Ramey (1994)	8 years of intervention – (5 yrs from infancy to kindergarten and 3 years in primary grades) vs. control	
Abecedarian Project (12 Yrs)- Campbell and Ramey (1994)	CBCC (SPP)	ES ($d = 0.24$); CD ($d = 0.53$)
	Preschool (5 years) vs. no preschool control	
Chicago Child-Parent Center (CPC)	(SPP); CBCC; FSS	ES ($d = -0.12$); CD ($d = 0.18$); SED ($d = 0.12$); FW ($d = 0.11$)
(11 Yrs) – Reynolds (1994)	Preschool only vs. control	
Chicago Child-Parent Center (CPC)	(SPP); CBCC; FSS	ES ($d = -0.39$); CD ($d = 0.29$); SED ($d = 0.11$); FW ($d = 0.11$)
(11 Yrs) – Reynolds (1994)	Preschool (6 yrs – preschool to grade 3) vs. control	
Chicago Child-Parent Center (CPC)	(SPP); CBCC; FSS	ES ($d = 0.16$); CJ ($d = 0.20$)
(20 Yrs) – Reynolds, Temple, Robertson, and Mann (2001)	Preschool (6 yrs – preschool to grade 3) vs. control	
Early Training Project	(SPP); HV	ES ($d = 0.29$); CD ($d = 0.16$); SED ($d = 0.65$);
(18 Yrs) – Lazar et al. (1982)	Preschool vs. control	
Early Training Project	(SPP); HV	CD ($d = 0.46$)
(13 Yrs) – Lazar et al. (1982)	Preschool vs. control	
Early Training Project	(SPP); HV	CD ($d = 0.51$)
(11 Yrs) – Gray and Klaus (1970)	Preschool vs. control.	
Elmira Nurse Home Visitation Program	(HV); FSS	FW ($d = 0.38$)
(15 Yrs) – Eckenrode et al. (2000)	Program vs. control	

Continued

APPENDIX A

Continued

Program + (Age at Follow-up)	Component (Major Component)	Effect Size
Learning to Learn (12 Yrs) – Sprigle and Shaefer (1985)	(SPP) Learning to Learn (preschool through grade 1) vs. Head Start	ES ($d = 0.94$); CD ($d = 0.51$)
Louisville experiment (13 Yrs) – Miller and Bizzell (1983)	(CBCC) Bereiter-Engelmann Preschool vs. Control	CD ($d = 0.24$)
Mother-Child Home program (17 Yrs) – Levenstein, Levenstein, Shiminski, and Stolzberg (1998)	(FSS) Program vs. control	ES ($d = 0.34$)
Perry Preschool Program (19 Yrs) – Berrueta-Clement, Schweinhart, Barnett, Epstein, and Weikart (1984)	(SPP); HV Program vs. control	D ($d = 0.645$); CJ ($d = 0.41$)
The Syracuse University Family Development Research Program (15 Yrs) – Lally, Mangione, and Honig (1988)	HV; CBCC; (FSS) Program vs. control	ES ($d = 0.82$); SED ($d = 0.40$); SP ($d = 0.45$); CJ ($d = 0.48$); FW ($d = 0.43$)
Parent-Child Development Centers (PCDCs) (15 Yrs) – Johnson (2006)	(SPP); HV; FSS; PE Houston PCDC vs. control 5 yr program infancy – 5 yrs	SED ($d = 0.23$)
Parent-Child Development Centers (PCDCs) (12 Yrs) – Johnson and Blumenthal (2004)	(SPP); HV; FSS; PE Houston PCDC vs. control 5 yr program infancy – 5 yrs	ES ($d = 0$); CD ($d = 0.36$); SED ($d = 0$); SP ($d = 0.32$); FW ($d = 0$)
Project Follow Through (Brooklyn Project) – Meyer (1984)	(SPP); HV Direct Instruction vs. control Preschool through grade 3	ES ($d = 0.38$); CD ($d = 0.42$)
Elmira Nurse Home Visitation Program (15 Yrs) – Olds et al. (1998)	(HV); FSS Program vs. control	ES ($d = 0.46$); D ($d = 0.28$); CJ ($d = 0.32$)

Range *d*

ES ($d = 0.00$–0.94); CD ($d = 0.16$–0.74); SED ($d = 0.00$–0.65); D ($d = 0.28$–0.65); SP ($d = 0.32$–0.45); CJ ($d = 0.20$–0.48); FW ($d = 0$–0.43)

Mean *d*

ES ($d = 0.532$); CD ($d = 0.334$); SED ($d = 0.148$); D ($d = 0.39$); SP ($d = 0.373$); CJ ($d = 0.244$); FW ($d = 0.204$)

Note. The corresponding variance, inverse variance, CI (confidence interval) Lower and Upper (95%) are available in Manning (2008).
Abbreviations. CBCC = center-based childcare/developmental day care; CD = cognitive development; CJ = criminal justice; D = deviance; ES = educational success; FSS = family/parenting support; FW = family well-being; HV = home visitation program; PE = parent education program; SED = social-emotional development; SP = social participation; SPP = structured preschool program.

Matthew Manning is an economist in the School of Criminology and Criminal Justice, Griffith University. Matthew has interests and experience in applied microeconomics, decision analysis, operations research, systematic and meta-analytic reviews and economic analysis techniques (e.g. cost-benefit analysis). Matthew's economic background has provided cross-disciplinary links with researchers and practitioners in the areas of criminology, psychology, special education, and operations research. He is author of 3 book chapters, 12 journal articles and 15 reports. He has collaborated with Christine Smith and Ross Homel on a number of publications that have been published in journals such as *Children and Youth Services Review, Economic Analysis and Policy and Journal of Public Policy.*

Christine Smith is a Professor of Economics in the Griffith Business School. She is currently the Head of the Department of Accounting, Finance and Economics. Her areas of research interest include regional and urban economics, policy evaluation and conflict management. She holds a Bachelor of Economics and Master of Regional Science from University of Queensland and an MA and PhD from Cornell University. She sits on numerous journal editorial boards and has been a Chief Investigator on a number of cross-disciplinary Australian Research Council grants. She is the author or editor of numerous books, book chapters, journal articles, government reports and consulting reports.

Ross Homel is a Professor of Criminology and Criminal Justice at Griffith University and Director of the Key Centre for Ethics, Law, Justice and Governance. He is a member of the Council for Humanities, Arts and Social Sciences, and is a Fellow of the Academy of Social Sciences. Professor Homel has published three monographs and six edited books, as well as more than 120 peer-reviewed papers and numerous high impact government reports. He has won numerous awards for his research on the prevention of crime, violence and injuries and the promotion of positive development and wellbeing for children and young people in socially disadvantaged communities. His accomplishments were recognized in January 2008 when he was appointed an Officer in the General Division of the Order of Australia (AO) for service to education, particularly in the field of criminology, through research into the causes of crime, early intervention and prevention methods. In 2010 received the Sellin-Glueck Award from the American Society of Criminology for criminological scholarship that considers problems of crime and justice as they manifest outside the United States.

Enhancing the Quality of Stakeholder Assessments of Evidenced-Based Prevention Programs

Abigail A. Fagan
University of Florida

The adapted multiple-criteria decision-making (MCDM) technique discussed by Manning, Smith, and Homel (2013, this issue) has the potential to advance translation research, which is concerned with understanding and promoting the processes by which scientific information is used to inform public policies and practices (Ginexi and Hilton, 2006; Spoth et al., 2013). Although many effective developmental crime prevention programs have been identified, only a small percentage is likely to be implemented in communities (Ginexi and Hilton, 2006; Printz, Sanders, Shapiro, Whitaker, and Lutzker, 2009; Saul, Wandersman, et al., 2008; Welsh, Sullivan, and Olds, 2010). For example, Kumpfer and Alvarado (2003) estimated that only approximately 10% of practitioners use effective family-based prevention programs with their clients. A national survey of U.S. school districts indicated that almost half (47%) of middle schools have adopted effective drug prevention curricula, but only 26% of them reported using such programs most frequently out of all their prevention services; it was more common for schools to implement local programs that had not been evaluated for effectiveness (Ringwalt et al., 2011).

The low rates of diffusion (Howell, 2003; Rogers, 1995) of evidence-based preventive interventions indicate the need for a greater understanding of the factors that most strongly influence programmatic decisions and how to elevate the role of scientific evidence in these judgments (Saul, Duffy, et al., 2008; Spoth et al., 2013). Although some research has indicated that evaluations of intervention effectiveness and cost–benefit analyses affect the adoption of new programs (Ginexi and Hilton, 2006; Kumpfer and Alvarado, 2003; Rohrbach, Ringwalt, Ennett, and Vincus, 2005), it is unknown exactly how such information is interpreted by policy makers and relied on during decision making. The MCDM

Direct correspondence to Abigail A. Fagan, Sociology and Criminology & Law, 3219 Turlington Hall, P.O. Box 117330, University of Florida, Gainesville FL 32611–7330 (e-mail: afagan@ufl.edu).

DOI:10.1111/1745-9133.12034

methodology may help elucidate such processes, as it seeks to foster discussion among community stakeholders of the relative utility of preventive interventions designed to reduce juvenile delinquency based on information regarding program effectiveness. However, the model also has some limitations that need to be addressed to ensure that stakeholders will adopt evidence-based programs and be able to implement them effectively. The current essay identifies the strengths and deficits of the adapted MCDM approach as described by Manning et al. (2013) and provides some recommendations for how the model might be expanded to bridge the gap between science and practice more effectively.

Potential Advantages of the MCDM Model

A strength of the MCDM model is that it explicitly prioritizes the role of evidence in program adoption decisions and provides a forum for multiple stakeholders to learn about and discuss information regarding "what works." This approach thus seeks to break down barriers between scientists and practitioners and deviates substantially from the typical process whereby program adoption decisions occur without much thought and with little attention to science. That is, in practice, such decisions often are based on what "sounds good," anecdotal evidence about what might work, or political or social pressures, and they rarely are based on scientific evidence regarding the factors that contribute to offending (Latessa, Cullen, and Gendreau, 2002).

Second, it provides more comprehensive information regarding program effectiveness and attention to outcomes likely to be important to policy makers and practitioners. Although criminologists tend to focus on "problems" like crime and seek to address "risk factors" that increase the likelihood of delinquency, community members may be more interested in enhancing protective factors and promoting positive youth outcomes (Benson, Leffert, Scales, and Blyth, 1998; Catalano, Hawkins, Berglund, Pollard, and Arthur, 2002; Roth and Brooks-Gunn, 2003). The adapted MCDM model recognizes this preference and identifies program effects on social-emotional development, social participation, and family well-being, as well as on deviance and criminal justice contact. Inclusion of diverse outcomes and attention to the needs and preferences of local stakeholders should facilitate program adoption (Hawkins, Catalano, and Arthur, 2002; Spoth, Greenberg, Bierman, and Redmond, 2004; Wandersman and Florin, 2003).

Third, the model provides a structured methodology and process by which stakeholders can reach a consensus on the primary goal(s) or outcome(s) to be achieved and the evidence-based programs that are best able to reach these goals. Whereas active community participation in prevention efforts should increase the likelihood that evidence-based programs will be supported, adopted, well implemented, and sustained over time (Hawkins et al., 2002; Specter, 2008; Wandersman and Florin, 2003), exactly how to facilitate collective decision making and ensure consensus has not been subject to much research (Wilson, Timmel, and Miller, 2004). The analytical hierarchy process (AHP) component of the MCDM model is designed intentionally to produce a consensus and avoid domination

of the conversation by particular individuals or groups. Successful implementation of this method may even improve the collective efficacy (Sampson, Raudenbush, and Earls, 1997) of the group/community as it allows for trust and cohesion to be built among stakeholders and provides information on how they can take action successfully to prevent youth offending (Chilenski, Ang, Greenberg, Feinberg, and Spoth, 2013; Fagan and Hawkins, 2012b).

Finally, the model uses a community-based participatory research approach that allows practitioners and scientists to exchange and learn from each other's wisdom, experience, and knowledge, which will likely enhance the ability of each group to realize its goals (Kerner, Rimer, and Emmons, 2005; Saul, Duffy, et al., 2008; Weissberg and Greenberg, 1998). The MCDM approach provides policy makers and community members with scientific findings that are otherwise difficult for them to access and interpret. To the extent that they participate in the discussions, scientists can learn more about what is most important to local stakeholders. They can then use this information when designing new programs, conducting evaluation and cost-effectiveness research, and considering how programs will be implemented in communities (Israel, Schultz, Parker, and Becker, 1998). Ideally, scientists will then be more motivated to estimate the less tangible benefits of youth crime programs, such as effects on individual and family well-being, as Manning et al. (2013) recommend.

Recommendations for Increasing the Adoption of Prevention Programs via the MCDM Model

Although the adapted MCDM model strives to reduce the gap between science and practice, it focuses too heavily on issues of concern to scientists and does not incorporate additional concerns of interest to practitioners, which will likely hinder its ability to facilitate the adoption of evidence-based programs. The primary outcomes to be discussed by stakeholders are effects on offending and well-being demonstrated via scientific evaluations of early childhood prevention programs. Although this type of information is likely to affect program adoption (Ginexi and Hilton, 2006; Kumpfer and Alvarado, 2003; Rohrbach et al., 2005), many other contextual, organizational, and programmatic factors also influence adoption, and opportunities to discuss these issues should be incorporated into the model.

Broadly speaking, systems and agency administrators must consider the fit between the new program and the organization that will be charged with delivering it, including the degree to which the agency has the financial resources, personnel, facilities, technology, and/or partners to deliver the intervention effectively (Chinman et al., 2005; Elliott and Mihalic, 2004; Miller and Shinn, 2005; Paulsell, Kisker, Love, and Raikes, 2002). Also, support should be given to the philosophical and/or theoretical approaches underlying the new innovation and to the compatibility of these perspectives with those of the community or agency in which the program will be implemented (Brown, 1995; Greenhalgh, Robert, Macfarlane, Bate, and Kyriakidou, 2004; Mihalic and Irwin, 2003). Aspects of the program itself, including its cost, complexity, length, and required materials and personnel, also

need to be considered by policy makers and service providers prior to adoption to ensure that the community has the capacity to deliver the intervention completely and effectively (Gottfredson et al., 2000; Rohrbach, Grana, Sussman, and Valente, 2006). Finally, although the adapted MCDM model allows policy makers to compare the relative utility of potential new programs, it does not provide a mechanism for contrasting the strengths and weaknesses of these interventions with current practices. This oversight is troubling, given that it is difficult to change the status quo (Brown, 1995; Latessa et al., 2002), and new innovations may only be adopted if they can be identified as having distinct advantages over what is already in place (Greenhalgh et al., 2004; Rogers, 1995).

As Manning et al. (2013) alluded to, the described methodology does not allow for a comparison of different types of prevention programming. The illustrative example provided in the article focuses on preschool prevention programs and takes for granted that communities want and need to use this approach to prevent problem outcomes and promote well-being. However, much research has established that multiple risk and protective factors contribute to youth delinquency (Hawkins, Catalano, and Miller, 1992; Herrenkohl et al., 2000). By extension, communities can prevent offending in several ways. For example, they can implement preschool programs that focus on family-related factors, school-based programs that address school or peer factors, or community-based programs that seek to change contextual influences on delinquency. The best means of producing widespread and long-lasting reductions in crime may be to implement a comprehensive approach that targets multiple risk and protective factors using a combination of varied preventive interventions (Farrington, 2000; Hawkins et al., 2002). The MCDM approach could thus be enhanced if it allowed policy makers to compare the relative strengths of multiple types of prevention programs as well as their own support for and capacity to implement these various approaches.

Finally, although the AHP has the potential to enhance collective decision making, it is difficult to evaluate how well this methodology will work in practice. As Manning et al. (2013) note, decision-making models rely on the ability of participants to compromise and reach consensus, but in practice, this can be difficult. Conflict can develop easily when bringing together stakeholders from diverse professional and personal backgrounds, who may have conflicting or competing goals and ideas about what is needed to prevent youth delinquency, promote well-being, or both (Merzel and D'Afflitti, 2003; Stith et al., 2006; Wandersman and Florin, 2003). Conversations may become tense, and skilled facilitators will be required to resolve problems, but it is unclear who would fulfill this role in the model described by Manning et al.

Likewise, even though the model may strive to present easy-to-understand information regarding program outcomes, community members may nonetheless struggle to interpret the results of meta-analytic reviews and scientific evaluations, and it is unclear how much assistance they will require or receive to do so. Finally, the MCDM process seems to presume that policy makers will value evidence-based programming, as it begins with the premise

that community members are ready to choose between various effective programs. Given that practitioners may be satisfied with their current practices, preliminary discussions are likely to be needed to bolster support for prevention prior to asking stakeholders to make new program adoption decisions.

To summarize, whereas the adapted MCDM process seeks to contribute to translational research, certain expansions of the model are recommended to enhance the likelihood that this methodology will foster the adoption of evidence-based programming, including the following:

- Attention to other factors likely to affect program adoption decisions, such as an organizational capacity to implement potential programs and programmatic characteristics that affect the ease of implementation
- Comparison of the strengths and weaknesses of prevention programs that have evidence of effectiveness as demonstrated in high-quality scientific evaluations and current practices that may not have been evaluated
- Comparison of programs that address risk and protective factors using different types of intervention strategies (e.g., preschool programs vs. mentoring or tutoring programs)
- Explicit processes to reduce conflict, enhance collaborative decision making, and ensure that community members understand and support scientific evidence regarding the causes of youth delinquency and how to prevent it

Rather than having this serve as a stand-alone model, particularly given its limitations in addressing the issues mentioned, Manning et al. (2013) might consider how the adapted MCDM approach could be integrated into existing and more comprehensive community-based approaches for preventing youth delinquency. This recommendation is made with some caution, however, given that the MCDM model has not yet been demonstrated as effective in increasing the rates at which stakeholders actually adopt new evidence-based programs. Additional evaluation of this approach, both in Australia where it was developed and in other countries interested in replicating it, is warranted prior to any large-scale dissemination efforts.

It also should be noted that relatively few comprehensive community-based approaches have been evaluated and shown to reduce rates of youth delinquency significantly (Fagan and Hawkins, 2012a; Hallfors, Cho, Livert, and Kadushin, 2002; Wandersman and Florin, 2003), which limits the number of options for integration. However, two such models, Communities That Care (Hawkins et al., 2002) and PROSPER (Spoth et al., 2004), have each been shown in randomized trials to reduce rates of youth substance use, offending, or both and to increase the adoption and high-quality implementation of prevention services across the communities in which they were implemented relative to control communities (Fagan, Arthur, Hanson, Briney, and Hawkins, 2011; Hawkins et al., 2009, 2012; Spoth, Guyll, Redmond, Greenberg, and Feinberg, 2011; Spoth et al., 2007). In each system, key

leaders, service providers, and other community stakeholders participate in group-based training workshops and receive ongoing consultation that emphasizes the developmental nature of offending and the advantages of preventive interventions, identifies effective programs targeting various risk and protective factors that affect youth 0–18 years of age, and advocates the coordinated delivery of multiple services to as many participants as possible to achieve community-wide improvements in youth well-being.

Although CTC and PROSPER each provide opportunities for community members to reach consensus on their prevention goals and to weigh the relative advantages of different preventive interventions, incorporation of the MCDM and AHP methodologies could enhance the quality of these conversations and their ability to result in effective decision making. Likewise, many of the challenges identified earlier regarding the MCDM and AHP models could be addressed if these methods were included as part of an already established, comprehensive, community-based approach.

References

Benson, Peter L., Nancy Leffert, Peter C. Scales, and Dale A Blyth. 1998. Beyond the "village" rhetoric: Creating healthy communities for children and adolescents. *Applied Developmental Science*, 2: 138–159.

Brown, Barry S. 1995. Reducing impediments to technology transfer in drug abuse programming. In (Thomas E. Backer, Susan L. David, and Gerald Paul Soucy, eds.), *Reviewing the Behavioral Science Knowledge Base on Technology Transfer*. Rockville, MD: National Institute on Drug Abuse.

Catalano, Richard F., J. David Hawkins, M. Lisa Berglund, John A. Pollard, and Michael W. Arthur. 2002. Prevention science and positive youth development: Competitive or cooperative frameworks? *Journal of Adolescent Health*, 31: 230–239.

Chilenski, Sarah M., Patricia M. Ang, Mark T. Greenberg, Mark E. Feinberg, and Richard Spoth. 2013. The impact of a prevention delivery system on perceived social capital: The PROSPER Project. *Prevention Science*. E-pub ahead of print.

Chinman, Matthew, Gordon Hannah, Abraham Wandersman, Patricia Ebener, Sarah B. Hunter, Pamela Imm, et al. 2005. Developing a community science research agenda for building community capacity for effective preventive interventions. *American Journal of Community Psychology*, 35: 143–157.

Elliott, Delbert S. and Sharon Mihalic. 2004. Issues in disseminating and replicating effective prevention programs. *Prevention Science*, 5: 47–53.

Fagan, Abigail A., Michael W. Arthur, Koren Hanson, John S. Briney, and J. David Hawkins. 2011. Effects of Communities That Care on the adoption and implementation fidelity of evidence-based prevention programs in communities: Results from a randomized controlled trial. *Prevention Science*, 12: 223–234.

Fagan, Abigail A. and J. David Hawkins. 2012a. Community-based substance use prevention. In (Brandon C. Welsh and David P. Farrington, eds.), *Oxford Handbook on Crime Prevention*. New York: Oxford University Press.

Fagan, Abigail A. and J. David Hawkins. 2012b. Preventing substance use, delinquency, violence, and other problem behaviors over the life-course using the Communities That Care System. In (Chris L. Gibson and Marvin D. Krohn, eds.), *Handbook of Life-Course Criminology*. New York: Springer-Verlag.

Farrington, David P. 2000. Explaining and preventing crime: The globalization of knowledge—The American Society of Criminology 1999 Presidential Address. *Criminology*, 38: 1–24.

Ginexi, Elizabeth M. and Thomas F. Hilton. 2006. What's next for translation research? *Evaluation and the Health Professions*, 29: 334–347.

Gottfredson, Gary D., Denise C. Gottfredson, Ellen R. Czeh, David Cantor, Scott B. Crosse, and Irene Hantman Westat. 2000. *Summary: National Study of Delinquency Prevention in Schools*. Ellicott City, MD: Gottfredson Associates.

Greenhalgh, Trisha, Glenn Robert, Fraser Macfarlane, Paul Bate, and Olivia Kyriakidou. 2004. Diffusion of innovations in service organizations: Systematic review and recommendations. *The Milbank Quarterly*, 82: 581–629.

Hallfors, Denise, Hyunsan Cho, David Livert, and Charles Kadushin. 2002. Fighting back against substance use: Are community coalitions winning? *American Journal of Preventive Medicine*, 23: 237–245.

Hawkins, J. David, Richard F. Catalano, and Michael W. Arthur. 2002. Promoting science-based prevention in communities. *Addictive Behaviors*, 27: 951–976.

Hawkins, J. David, Richard F. Catalano, and Janet Y. Miller. 1992. Risk and protective factors for alcohol and other drug problems in adolescence and early adulthood: Implications for substance abuse prevention. *Psychological Bulletin*, 112: 64–105.

Hawkins, J. David, Sabrina Oesterle, Eric C. Brown, Michael W. Arthur, Robert D. Abbott, Abigail A. Fagan, et al. 2009. Results of a type 2 translational research trial to prevent adolescent drug use and delinquency: A test of Communities That Care. *Archives of Pediatric Adolescent Medicine*, 163: 789–798.

Hawkins, J. David, Sabrina Oesterle, Eric C. Brown, Kathryn C. Monahan, Robert D. Abbott, Michael W. Arthur, et al. 2012. Sustained decreases in risk exposure and youth problem behaviors after installation of the Communities That Care prevention system in a randomized trial. *Archives of Pediatrics and Adolescent Medicine*, 166: 141–148.

Herrenkohl, Todd I., Eugene Maguin, Karl G. Hill, J. David Hawkins, Robert D. Abbott, and Richard F. Catalano. 2000. Developmental risk factors for youth violence. *Journal of Adolescent Health*, 26: 176–186.

Howell, James C. 2003. Diffusing research into practice using the comprehensive strategy for serious, violent, and chronic juvenile offenders. *Youth Violence and Juvenile Justice*, 1: 219–245.

Israel, Barbara A., Amy J. Schultz, Edith A. Parker, and Adam B. Becker. 1998. Review of community-based research: Assessing partnership approaches to improve public health. *American Review of Public Health*, 19: 173–202.

Kerner, Jon F., Barbara Rimer, and Karen Emmons. 2005. Dissemination research and research dissemination: How can we close the gap? *Health Psychology*, 24: 443–446.

Kumpfer, Karol L. and Rose Alvarado. 2003. Family-strengthening approaches for the prevention of youth problem behaviors. *American Psychologist*, 58: 457–465.

Latessa, Edward J., Francis T. Cullen, and Paul Gendreau. 2002. Beyond correctional quackery—Professionalism and the possibility of effective treatment. *Federal Probation*, 66: 43–49.

Manning, Matthew, Christine Smith, and Ross Homel. 2013. Valuing developmental crime prevention. *Criminology & Public Policy*, 12: 305–332.

Merzel, Cheryl and Joanna D'Afflitti. 2003. Reconsidering community-based health promotion: Promise, performance, and potential. *American Journal of Public Health*, 93: 557–574.

Mihalic, Sharon F. and Katherine Irwin. 2003. Blueprints for violence prevention: From research to real world settings—Factors influencing the successful replication of model programs. *Youth Violence and Juvenile Justice*, 1: 307–329.

Miller, Robin L. and Marybeth Shinn. 2005. Learning from communities: Overcoming difficulties in dissemination of prevention and promotion efforts. *American Journal of Community Psychology*, 35: 169–183.

Paulsell, Diane, Ellen Eliason Kisker, John M. Love, and Helen H. Raikes. 2002. Understanding implementation in early Head Start programs: Implications for policy and practice. *Infant Mental Health Journal*, 23: 14–35.

Printz, Ronald J., Matthew R. Sanders, Cheri J. Shapiro, Daniel J. Whitaker, and John R. Lutzker. 2009. Population-based prevention of child maltreatment: The U.S. Triple P system population trial. *Prevention Science*, 10: 1–12.

Ringwalt, Christopher L., Amy A. Vincus, Sean Hanley, Susan T. Ennett, J. Michael Bowling, and Susan W. Haws. 2011. The prevalence of evidence-based drug use prevention curricula in U.S. middle schools in 2008. *Prevention Science*, 12: 63–70.

Rogers, Everett M. 1995. *Diffusion of Innovations*, 4th Edition. New York: The Free Press.

Rohrbach, Louise A., Rachel Grana, Steve Sussman, and Thomas W. Valente. 2006. Type II translation: Transporting prevention interventions from research to real-world settings. *Evaluation and the Health Professions*, 29: 302–333.

Rohrbach, Louise A., Christopher L. Ringwalt, Susan T. Ennett, and Amy A. Vincus. 2005. Factors associated with adoption of evidence-based substance use prevention curricula in U.S. school districts. *Health Education Research*, 20: 514–526.

Roth, Jodie L. and Jeanne Brooks-Gunn. 2003. Youth development programs: Risk, prevention and policy. *Journal of Adolescent Health*, 32: 170–182.

Sampson, Robert J., Stephen W. Raudenbush, and Felton Earls. 1997. Neighborhoods and violent crime: A multilevel study of collective efficacy. *Science*, 277: 918–924.

Saul, Janet, Jennifer Duffy, Rita Noonan, Keri Lubell, Abraham Wandersman, Paul Flaspohler, et al. 2008. Bridging science and practice in violence prevention: Addressing ten key challenges. *American Journal of Community Psychology*, 41: 197–205.

Saul, Janet, Abraham Wandersman, Paul Flaspohler, Jennifer Duffy, Keri Lubell, and Rita Noonan. 2008. Research and action for bridging science and practice in prevention. *American Journal of Community Psychology*, 41: 165–170.

Specter, Arlen. 2008. Making youth violence prevention a national priority. *American Journal of Preventive Medicine*, 34: S3–S4.

Spoth, Richard L., Mark T. Greenberg, Karen L. Bierman, and Cleve Redmond. 2004. PROSPER community-university partnership model for public education systems: Capacity-building for evidence-based, competence-building prevention. *Prevention Science*, 5: 31–39.

Spoth, Richard L., Max Guyll, Cleve Redmond, Mark T. Greenberg, and Mark E. Feinberg. 2011. Six-year sustainability of evidence-based intervention implementation quality by community-university partnerships: The PROSPER study. *American Journal of Community Psychology*, 48: 412–425.

Spoth, Richard L., Cleve Redmond, Chungyeol Shin, Mark T. Greenberg, Scott Clair, and Mark E. Feinberg. 2007. Substance use outcomes at eighteen months past baseline from the PROSPER community-university partnership trial. *American Journal of Preventive Medicine*, 32: 395–402.

Spoth, Richard L., Louise A. Rohrbach, Mark T. Greenberg, Philip Leaf, C. Hendricks Brown, Abigail A. Fagan, et al. 2013. Addressing core challenges for the next generation of Type 2 translation research and systems: The translation science to population impact (TSci impact) framework. *Prevention Science*, 14: 319–351.

Stith, Sandra, Irene Pruitt, Jemeg Dees, Michael Fronce, Narkia Green, Anurag Som, et al. 2006. Implementing community-based prevention programming: A review of the literature. *The Journal of Primary Prevention*, 27: 599–617.

Wandersman, Abraham and Paul Florin. 2003. Community intervention and effective prevention. *American Psychologist*, 58: 441–448.

Weissberg, Roger P. and Mark T. Greenberg. 1998. Prevention science and collaborative community action research: Combining the best from both perspectives. *Journal of Mental Health*, 7: 479–492.

Welsh, Brandon C., Christopher J. Sullivan, and David L. Olds. 2010. When early crime prevention goes to scale: A new look at the evidence. *Prevention Science*, 11: 115–125.

Wilson, David Sloan, John J. Timmel, and Ralph R. Miller. 2004. When the going gets tough, think as a group. *Human Nature*, 15: 1–15.

Abigail A. Fagan is an associate professor in the Department of Sociology, Criminology & Law at the University of Florida. Dr. Fagan's research focuses on the etiology and prevention of juvenile delinquency and substance use, with an emphasis on examining the ways in which scientific advances can be successfully translated into effective crime and delinquency prevention practices.

Enhancing Translational Knowledge on Developmental Crime Prevention

The Utility of Understanding Expert Decision Making

Christopher J. Sullivan
University of Cincinnati

As knowledge regarding individual offending over the life course has increased in recent decades, calls for the use of early intervention as a means of preventing later crime have grown in close correspondence (Catalano, 2007; Farrington and Welsh, 2007; Greenwood, 2006). The work of promoting and facilitating the use of related research evidence in formal policy and practice is now underway as well (Welsh and Farrington, 2011). Manning, Smith, and Homel (2013, this issue) expand the lens through which such programs are studied and discussed by drawing on approaches from economics and management science to summarize decision-making preferences of experts in the field. Specifically, they present a different way of considering how policymakers and practitioners assess and prioritize interventions intended to promote individual quality of life. This approach to understanding developmental crime prevention builds on important research both inside and outside of criminology, suggesting some directions for enhancing the evidence base and its subsequent utilization by policymakers and practitioners in the process. Indeed, in pursuing a "translational criminology" (see Laub, 2011), there is much insight to be drawn, and many more questions to be studied, building on Manning et al.'s conceptual foundation, methodological approach, and key findings.

Manning et al. (2013) identify the need for a protocol to determine how policymakers decide on evidence-based policy and programming and highlight the importance of improving the measurement of the benefits of early intervention programs (see also Karoly et al., 1998; Nagin, 2001). The emphasis on viewing these possibilities through the eyes of those who actually make funding and implementation decisions is crucial and lays the groundwork for some future research on the movement of science to practice. Using an analytic hierarchy process (AHP) in conjunction with a survey of 25 expert decision

The author thanks Brandon Welsh for helpful comments on an earlier version of this essay. Direct correspondence to Christopher J. Sullivan, School of Criminal Justice, University of Cincinnati, 665K Dyer Hall, Clifton Ave, Cincinnati, OH 45221 (e-mail: Christopher.sullivan@uc.edu).

DOI:10.1111/1745-9133.12037

makers (researchers and policymakers in government and community agencies), they find a preference for the family well-being outcome, followed by social emotional development, as far as prioritizing the objectives of early intervention. Preventing deviant behavior and criminal justice involvement generally received lower priority in those rankings. Based on their initial survey results, Manning et al. then used AHP to identify programs that were thought to contribute to desired outcomes. The results indicated that (a) generally those surveyed prioritized a "very high" program effect on the outcome of interest and (b) the structured preschool, family support services, and parental education interventions were given relatively higher priority by respondents. Interestingly, during the process, Manning et al. introduced a summary of meta-analysis results of these prevention programs into the AHP and found that it did not seem to have much impact on the relative preferences of survey respondents. This finding raises some important questions about the role of research evidence in the decisions made by policymakers and others in the field.

Enhancing Understanding of Policy and Practice Decisions for Translation

The framework for valuing developmental prevention highlighted by Manning et al. (2013) goes some way toward organizing key inputs in the process that might be undertaken by those responsible for such decisions. Several steps could help the field move from Manning et al.'s work, which they describe as "illustrative," to a better, more "definitive" translational criminology around developmental prevention strategies and interventions designed to prevent crime more generally. Many of those tasks relate to resolving ambiguity, which was mentioned as a limitation by Manning et al. (see also Saaty, 1988: 4) to refine understanding of how to facilitate the movement of research evidence into policy and practice.

Ranking preferences in a multicriteria analysis is informative and can provide broader insight on values around different initiatives (Nagin, 2001), but researchers also must look more closely at how decisions are made in these contexts to understand the possibilities and limits of scientific research findings in the implementation of evidence-based policy and practice (Bowen and Zwi, 2005; Prewitt, Schwandt, and Straf, 2012; Tseng, 2012; Weiss and Bucuvalas, 1980). Key insights emerging from the growing subfield of implementation science suggest that the development and rigorous evaluation of new programs is only half of producing policy-relevant research (Fixsen, Blasé, Metz, and van Dyke, 2013; Welsh and Farrington, 2011). To that end, several steps must be taken to expand prospects for successful implementation of the evidence-based programs considered by Manning et al.

Enhancing the Understanding of Challenges and Opportunities in Developmental Prevention

Fixsen et al. (2013) asserted that there is a need for both a strong evidence base around a given intervention (or category of programs) *and* an understanding of how to implement it well for it to translate to the real world (see also Laub, 2011). Although the literature on effective developmental prevention has grown considerably and some strong interventions

have been identified (e.g., Farrington and Welsh, 2007; Karoly et al., 1998; Tremblay and Craig, 1995), more can be learned about effective early intervention—particularly in terms of the factors that lead to relatively more or less success—to solidify that evidence base. Manning et al. (2013) mention the need to consider possible intangible benefits in valuing developmental prevention programs, but important costs and challenges should also be studied.

Karoly et al. (1998: xiii) pointed out that the research on developmental prevention generally lends itself to "inferences as to what some programs *can* do" (emphasis in original), and this is still very much the case. Furthermore, it is likely that policymakers and practitioners will be keenly aware of such challenges and view the research evidence with those firmly ensconced in their thinking. For instance, in developmental prevention, difficulties in early identification and prediction can inevitably lead to the inclusion of some youth who are false positives. Given that the nature of target populations is essential in considering the potential for scaling up early intervention after demonstrating efficacy initially (Welsh, Sullivan, and Olds, 2010), it is important to consider the effect moderators associated with identification and implementation. Greater insight on the issues that emerge in "scaling up" might be helpful in considering the "trade-off between intensity levels of success" that Manning et al. (2013) mention with respect to the weighting of different programming options and effect sizes. Also, it is important to consider these points in light of the "prevention paradox" and related discussions of how to best target limited resources for crime prevention (see Ludwig, 2012; Welsh, Braga, and Sullivan, 2013). In general, although the evidence base for developmental prevention has grown, more can be done to shore it up ahead of potential translation to policymakers and practitioners.

Enhancing Understanding of the Decision-Making Process

As Manning et al. (2013) point out (see also Manning, Smith, and Homel, 2011), Saaty (1988) developed the AHP as a systematic method for enumerating key elements of a decision, disaggregating them, and then arriving at a summary of relative preferences. Saaty (1988) emphasized the method's ability to decompose complex decisions into smaller pieces and then synthesize those components to understand the relationships among them. To whatever extent possible, it is important to be both inclusive and precise in measuring and analyzing the different inputs that might go into expert decisions and their relative weighting. This precision must occur both at a broad level in terms of the preferences that are ultimately arrived at as well as in the operationalization of specific prompts and information provided to respondents in the AHP.[1] In justifying the AHP method, Saaty (1988: 22) pointed out the importance of "mak[ing] each step as explicit as possible in order

1. Saaty (1988, 2005) provided several examples of expansion of AHP to integrate further elements, and Saaty (2005) gave an overview of an analytic network process (ANP) that expands the framework for considering complex, interactive decisions that may be relevant to readers.

to enable the potential user to form his own judgment on the *meaning and value* of the method in relation to *his* problem and *his* goal" (emphasis in original). He also indicated that it is important to "fit our entire world experience into our system of priorities if we are going to understand it" (Saaty, 2005: 348). Therefore, the expert's direct knowledge should be incorporated into AHP in some depth as a means of better understanding decision making.

As a result of years of research on how empirical findings are used in the field and government, researchers have found that, although evaluation results do find their way into policy and practice, the path that the information travels is not what is generally expected by social scientists (e.g., Bowen and Zwi, 2005; Weiss, 1982, 1999; Weiss and Bucuvalas, 1980). Incorporating meta-analysis results on developmental interventions in the expanded AHP approach definitely provides an important input, but as the findings regarding the role of the effect size information demonstrate, other factors like existing views and preferences, current law and policy, the need to satisfy multiple constituencies, organizational contexts, and the weight given to individual decisions within agencies, among others, likely will play a significant role in actual decisions (Bowen and Zwi, 2005; Tseng, 2012; Weiss and Bucuvalas, 1980). These and other relevant factors must be specified and operationalized to ensure that schematics and analytic tools like AHP fully capture decision making as it is among those in a position to move research to practice to get beyond how researchers might envision it playing out.

In general, the decision-making process is more diffuse, complex, uncertain, and, in a strict sense, less rational than a direct research-to-policy/practice model or hierarchical weighing of options might suggest (Bowen and Zwi, 2005; Manski, 2013; Weiss and Bucuvalas, 1980). Consequently, it is important to develop a full understanding of (a) the various inputs that might impact such decisions as well as (b) the methods that individuals use in weighing and prioritizing them. Incorporating these and other insights from the technology transfer literature into an AHP process would likely help in developing a better sense of how preferences are arrived at, which, in turn, should improve criminologists' understanding of how to facilitate translation of evidence to practice.

In considering crime prevention policy in particular, it will be useful to examine these decisions on a continuum to best capture the variety of options available to those who make funding decisions. Manning et al.'s (2013) emphasis on the different range of programs that fall under the umbrella of developmental prevention (e.g., preschool and home visitation) as well as the possible areas where they might have positive effects (e.g., family well-being and forestalling justice involvement) is especially useful as it highlights the need for a holistic view of available interventions. It is important, however, that the full range of crime prevention and control choices available to decision makers is considered as well. Public opinion polls frequently compare and contrast the degree of support for different options (e.g., community corrections facilities, jails, and prisons) (Nagin, Piquero, Scott, and Steinberg, 2006). Integrating those choices and possible outcomes is another way of

taking Manning et al.'s scheme further in understanding how policy decisions are made across a spectrum of options and revealing where empirical evidence fits in that process.

In this context, although developmental crime prevention may arguably have greater relative payoff, decision makers might prioritize other approaches based on considerations beyond the effect sizes obtained in program evaluations or even expenditures involved. One key facet of situational crime prevention strategies, for example, is the belief that their success does not rest on fundamentally changing offenders or dealing with somewhat intractable root causes of crime (Clarke, 1995). This fundamental premise may tie into some of the subjective beliefs held by experts that Manning et al. (2013) mention in their discussion of possible decision-making inputs and, moreover, may have other perceived benefits from the standpoint of decision makers that may be realized more quickly. For instance, as Manning et al. argue, expanding police funding may be inefficient economically, but it could help a policymaker accumulate political capital in some circles. It is important to introduce these additional information points into the analysis of how preferences are weighed in considering how best to deliver evidence to policymakers and practitioners (including skeptics) as well as generally sensitizing researchers to where particular policy options might fit in a broader array of choices. At the very least, it is important to consider the salience of a wide range of possible influences on expert decision-making and then structure the model in terms of their relative prioritization.

Enhancing the Measurement and Analysis of the Decision-Making Process

Although technical and operational limitations must be kept in mind (see Manning, 2008), the AHP approach provides a novel way of tackling the question of how interventions are valued by relevant groups. Other methods can accomplish similar goals to what Manning et al. (2013) seek to achieve with AHP, so it would be useful to know how this method compares with, or perhaps even improves on, them. For example, the cost–benefit tool developed by Aos and colleagues in Washington State (see Lee et al., 2012) is now common, at least in the United States, in public policy decisions in crime and justice. Importantly, and especially relevant to Manning et al.'s approach, that model has been expanded to include other developmental outcomes; it is no longer focused solely on crime.

Some further additions, or related strands of research, may help expand the AHP's usefulness for translational criminology. For example, researchers might build on Manning et al.'s (2013) foundation to consider the prioritization of different choices within a survey using systematic experimental variation in the information inputs given to respondents. This approach would parallel contingent valuation studies that systematically vary information provided to respondents in a way that allows for an assessment of different policy preferences (e.g., Nagin et al., 2006). In the case of AHP, such research can help to identify the differential weighting that is placed on key elements within the process. As noted, one key question coming from Manning et al.'s results is the degree to which empirical research affects expert preference. Systematically varying the information across a larger pool of respondents may be

useful in isolating its role in the process. It also would be worthwhile to consider thoroughly the degree to which other factors moderate decision makers' perceptions of these programs. For example, are they aware of the heterogeneity of effects based on program implementation (and the challenges that come with ensuring fidelity)?

Another question pertains to how policymakers and practitioners consider this research evidence ("objective" inputs) in light of their existing beliefs ("subjective" inputs), whether from ideology or other sources (see Weiss and Bucuvalas, 1980). A Bayesian framework for analysis and information processing provides a natural fit to that problem as it inherently deals with prior expectations that may be adjusted prospectively based on some evidence to yield a posterior belief (Sullivan and Mieczkowski, 2009). Consequently, melding some variant of the AHP approach with a Bayesian updating procedure could be useful in linking prior beliefs to the expectations that emerge after one considers evidence of the type included in Manning et al.'s work. This process also reflects the grafting of research evidence with existing knowledge found in studies of the utilization of social science research by those in the field (e.g., Bowen and Zwi, 2005; Bowen, Zwi, Sainsbury, and Whitehead, 2009; Weiss, 1982; Weiss and Bucuvalas, 1980). This would offer some sense of the degree to which introducing this evidence matters as observed change or stability from prior to posterior estimates can, at least in part, capture its weighting on the part of decision makers.

The comments to this point generally have focused on the broader issue of moving scientific evidence to policy and practice, but Manning et al.'s (2013) main intent is to build on Nagin's (2001) call to develop alternatives for measuring the value of these interventions. Given the objective of capturing perceived value, it is important that the results of that process are incorporated into subsequent analyses to determine how they correspond with actual decisions about resource allocation. Looking at the potential association between the two would serve to (a) help validate AHP as a means of measuring the factors and processes that drive decisions and (b) provide substantive insight into whether and how preferences that are part of an AHP manifest themselves in later policy choices—or perhaps are superseded by emerging or preexisting circumstances.

To meet these objectives, after completing AHP, a subgroup of respondents might be asked to walk researchers through their responses to help illustrate why they value certain options more than others.[2] For example, how do they explicitly or implicitly connect their valuation of particular intervention modalities or objectives to "improved quality of life"? Again, this approach also might yield insight into why the meta-analysis results did not play a larger role in affecting relative preferences here. In this way, AHP also may produce more insight into how preferences are arrived at, which can inform their use in further analysis of important decisions and factor into strategies about how research translates to policy

2. At a previous stage of the process, this approach also might be used like a traditional pilot test of a survey instrument to identify those inputs most relevant to decision making for a particular subgroup of interest. Those "pretest" results can then help in developing the AHP model in a given study.

and practice. Second, assuming that respondents have an opportunity to make important choices on resource targeting, implementation, or both, a follow-up survey might assess the degree to which there is consistency in their stated valuation and subsequent decisions. An expansion of AHP methods to include these aspects of the measurement and analytic process more explicitly might serve to establish validity around the key variables involved in and produced by the process as well as the relationship between the output of that process and actual decision making.

Conclusion: Enhancing Translational Criminology for More Beneficial Policy and Practice

The development of a science of translation and implementation within criminology is essential in determining what policymakers and others in the field require to embrace and enthusiastically champion evidence-based programs (see Homel and Homel, 2012). As Manning et al.'s (2013) work demonstrates, much can be gained from research that considers prevention options and the weight carried by scientific evidence from the perspective of those who might actually make the implementation decisions that matter. Manning et al. also illustrate the importance of considering approaches and insights drawn from other fields in building a knowledge base on these issues (to which I hope to have added a few helpful observations). The use of the AHP approach provides an initial sense of preferences about developmental prevention programs among prominent decision makers, moving the field toward a better understanding of how to translate evidence to practice. Simultaneously, Manning et al. raise questions that, when pursued in light of extant research in related areas, might help in expanding the knowledge base for identifying beneficial programs and facilitating their real-world implementation.

References

Bowen, Shelley and Anthony B. Zwi. 2005. Pathways to "evidence-informed" policy and practice: A framework for action. *PLoS Medicine*, 2: e166.

Bowen, Shelley, Anthony B. Zwi, Peter Sainsbury, and Margaret Whitehead. 2009. Killer facts, politics and other influences: What evidence triggered early childhood intervention policies in Australia? *Evidence and Policy*, 5: 5–32.

Catalano, Richard F. 2007. Prevention is a sound public and private investment. *Criminology & Public Policy*, 6: 377–398.

Clarke, Ronald V. 1995. Situational crime prevention. In (Michael Tonry and David P. Farrington, eds.), *Building a Safer Society: Strategic Approaches to Crime Prevention. Crime and Justice: A Review of Research*, Vol. 19. Chicago, IL: University of Chicago Press.

Farrington, David P. and Brandon C. Welsh. 2007. *Saving Children from a Life of Crime: Early Risk Factors and Effective Interventions*. New York: Oxford University Press.

Fixsen, Dean, Karen Blasé, Allison Metz, and Melissa van Dyke. 2013. Statewide implementation of evidence-based programs. *Exceptional Children*, 79: 213–230.

Greenwood, Peter W. 2006. *Changing Lives: Delinquency Prevention as Crime-Control Policy*. Chicago, IL: University of Chicago Press.

Homel, Ross and Peter Homel. 2012. Implementing crime prevention: Good governance and a science of implementation. In (Brandon C. Welsh and David P. Farrington, eds.), *The Oxford Handbook of Crime Prevention*. New York: Oxford University Press.

Karoly, Lynn A., Peter W. Greenwood, Susan S. Everingham, Jill Houbé, M. Rebecca Kilburn, C. Peter Rydell, et al. 1998. *Investing in our Children: What We Know and Don't Know About the Costs and Benefits of Early Childhood Interventions*. Santa Monica, CA: The RAND Corporation.

Laub, John H. 2011. Moving the National Institute of Justice forward. *The Criminologist*, 36: 1, 3–5.

Lee, Stephanie, Steve Aos, Elizabeth K. Drake, Anne Pennucci, Marna G. Miller, and Laurie Anderson. 2012. *Return on Investment: Evidence-Based Options to Reduce Statewide Outcomes*. Olympia: Washington State Institute for Public Policy.

Ludwig, Jens. 2012. Cost-effective crime prevention. In (Richard Rosenfeld, Kenna Quinet, and Crystal Garcia, eds.), *Contemporary Issues in Criminological Theory and Research: The Role of Social Institutions*. Belmont, CA: Cengage.

Manning, Matthew. 2008. *Economic Evaluation of the Effects of Early Childhood Intervention on Adolescent Outcomes*. Unpublished Ph.D. thesis, Key Centre for Ethics, Law, Justice and Governance, Griffith University, Brisbane, Australia.

Manning, Matthew, Christine Smith, and Ross Homel. 2011. An economic method for formulating better policies for child development. *Australian Review of Public Affairs*, 10: 61–77.

Manning, Matthew, Christine Smith, and Ross Homel. 2013. Valuing developmental crime prevention. *Criminology & Public Policy*, 12: 305–332.

Manski, Charles F. 2013. *Public Policy in an Uncertain World*. Cambridge, MA: Harvard University Press.

Nagin, Daniel S. 2001. Measuring the economic benefits of developmental prevention programs. In (Michael Tonry, ed.), *Crime and Justice: A Review of Research*, Vol. 25. Chicago, IL: University of Chicago Press.

Nagin, Daniel S., Alex R. Piquero, Elizabeth Scott, and Laurence Steinberg. 2006. Public preferences for rehabilitation versus incarceration of juvenile offenders: Evidence from a contingent valuation survey. *Criminology & Public Policy*, 5: 627–651.

Prewitt, Kenneth, Thomas A. Schwandt, and Miron L. Straf (eds.). 2012. *Using Science as Evidence in Public Policy*. Washington, DC: The National Academies Press.

Saaty, Thomas L. 1988. *Multicriteria Decision Making: The Analytic Hierarchy Process*. New York: McGraw-Hill.

Saaty, Thomas L. 2005. The analytic hierarchy and analytic network processes for the measurement of intangible criteria and for decision-making. In (Josė Figueira, Salvatore Greco, and Matthias Ehrgott, eds.), *Multiple Criteria Decision Analysis: State of the Art Surveys*. Boston, MA: Springer Science+Business Media.

Sullivan, Christopher J. and Thomas Mieczkowski. 2008. Bayesian statistics, evaluation, and the accumulation of evidence in crime and justice intervention studies. *Journal of Experimental Criminology*, 4: 381–402.

Tremblay, Richard E. and Wendy M. Craig. 1995. Developmental crime prevention. In (Michael Tonry and David P. Farrington, eds.), *Building a Safer Society: Strategic Approaches to Crime Prevention. Crime and Justice: A Review of Research*, Vol. 19. Chicago, IL: University of Chicago Press.

Tseng, Vivian. 2012. The uses of research in policy and practice. *Society for Research in Child Development, Social Policy Report*, 26: 1–16.

Weiss, Carol H. 1982. Policy research in the context of diffuse decision making. *The Journal of Higher Education*, 53: 619–639.

Weiss, Carol H. 1999. The interface between evaluation and public policy. *Evaluation*, 5: 468–486.

Weiss, Carol H. and Michael J. Bucuvalas. 1980. *Social Science Research and Decision-Making*. New York: Columbia University Press.

Welsh, Brandon C., Anthony A. Braga, and Christopher J. Sullivan. 2013. Serious youth violence and innovative prevention: On the emerging link between public health and criminology. *Justice Quarterly.* E-pub ahead of print.

Welsh, Brandon C. and David P. Farrington. 2011. Evidence-based crime policy. In (Michael Tonry, ed.), *Oxford Handbook of Crime and Criminal Justice*. New York: Oxford University Press.

Welsh, Brandon C., Christopher J. Sullivan, and David Olds. 2010. When early crime prevention goes to scale: A new look at the evidence. *Prevention Science*, 11:115–125.

Christopher J. Sullivan is an associate professor in the School of Criminal Justice at the University of Cincinnati. He received his Ph.D. from Rutgers University in 2005. His research interests include developmental, life-course criminology; juvenile delinquency and prevention policy; and research methodology and analytic methods. His recent work has appeared in *Journal of Research in Crime and Delinquency, Criminology, Criminal Justice and Behavior,* and *Justice Quarterly*.

Building Efficient Crime Prevention Strategies

Considering the Economics of Investing in Human Development

D. Max Crowley
Duke University

The aftermath of the global recession has encouraged policy makers to confront the staggering public burden of crime (Cohen, 1988, 2005; Ludwig, 2010; McCollister, French, and Fang, 2010; Miller, Cohen, and Rossman, 1993). In this context, there is growing acceptance that many "tough-on-crime" policies have become primary drivers of crime's increasing societal cost (Andrews and Bonta, 2010; Artello, 2013; Becker, 1968; Braga and Weisburd, 2011; Cameron, 1988; Cohen, 2005; Paternoster, 2010; Rikard and Rosenberg, 2007; Vitiello, 2013). Policy makers have responded with growing interest in making strategic investments in youth that prevent the development of lifetime offenders, instead of continuing to institute harsher punishments that lead to costly mass incarceration (Dodge, 2001; Farrington, 1994; Heckman, 2006; Homel, 2013; O'Connell, Boat, and Warner, 2009). In response, innovative strategies for preventing crime and controlling costs are being engaged (Barnett and Masse, 2007; Guyll, Spoth, and Crowley, 2011; Welsh and Farrington, 2010). At the forefront are developmental prevention programs that intervene early in life to reduce risk factors for delinquent and criminal behaviors (Durlak, 1998; Eckenrode et al., 2010; Hawkins, Catalano, and Miller, 1992; Hawkins and Weis, 1985; Reynolds, Temple, White, Ou, and Robertson, 2011). As a growing body of evidence illustrates, when implemented appropriately, these developmental prevention efforts not only effectively prevent crime but also are cost-effective solutions that save public resources (Crowley, Hill, Kuklinski, and Jones, 2013; Crowley, Jones, Greenberg, Feinberg,

The author gratefully acknowledges the feedback from Dr. Ken Dodge, Center for Child and Family Policy, Duke University, and Dr. Philip Cook, Sanford School of Public Policy, Duke University. Direct correspondence to D. Max Crowley, Center for Child and Family Policy, Duke University, 215 Rubenstein Hall, Box 90545, 302 Towerview Road, Durham, NC 27708–0545 (e-mail: dmc27@duke.edu).

DOI:10.1111/1745-9133.12041

and Spoth, 2012; Heckman, Moon, Pinto, Savelyev, and Yavitz, 2010; Klietz, Borduin, and Schaeffer, 2010; Kuklinski, Briney, Hawkins, and Catalano, 2012; Reynolds et al., 2011).

Manning, Smith, and Homel (2013, this issue) outline an innovative approach for valuing these programs to guide policy making. Their work draws on Saaty's analytical hierarchy process (AHP), often used in the private sector, but less frequently in policy settings (Saaty, 1988). This method ultimately provides an important framework for discussing how to build effective and efficient crime prevention efforts informed by developmental science (Gifford-Smith, Dodge, Dishion, and McCord, 2005; Lerner et al., 2005; Osgood, 2005).

In this essay, I expand on Manning et al.'s (2013) discussion by highlighting how this new approach can complement current efforts to value developmental crime prevention programs for evidence-based policy making. I then discuss the importance of considering local programming capacity when investing in prevention and the economic value of prevention approaches that invest in both youth and their families (i.e., dual-generation approaches). Next, I provide a forward look at two approaches policy makers can engage when seeking to fund developmental prevention. I then conclude with four action steps for research and policy that can facilitate the dissemination of effective and efficient developmental crime prevention efforts.

Strategies for Valuing Developmental Prevention to Inform Public Policy

Broadly, the priority ranking and utility approach employed by Manning et al. (2013) is similar to ex-ante approaches used to elicit willingness-to-pay estimates around the cost of crime as well as cost-effectiveness analyses often employed in health-care decision making (Birch and Gafni, 1992; Donaldson, Farrar, Mapp, Walker, and Macphee, 1997; Ludwig and Cook, 2001; Olsen and Smith, 2001; Zarkin, Cates, and Bala, 2000). Such approaches are gaining acceptance as they aim to estimate the value of preventing crime more completely—departing from ex-post approaches that rely explicitly on monetizable burden (Brookshire and Crocker, 1981; Ryan and Watson, 2009). Furthermore, particularly for health outcomes, they avoid certain distributional problems that value morbidity and mortality at different rates for different groups (e.g., women and minorities; see Donaldson, Birch, and Gafni, 2002). The United Kingdom's National Institute for Health and Clinical Excellence (NICE) is one of the better known examples where national health policy is currently being informed by such utility-based approaches for valuing public services (Kelly et al., 2010; Weatherly et al., 2009).

Although there is growing support for employing utility estimates to guide decision making, these approaches can be limited by the lack of clear cost and benefit estimates (Marsh, Chalfin, and Roman, 2008; Weinstein and Manning, 1997). In particular, analysts scoring the fiscal impact of new policies for government bodies require robust estimates of prevention programs' downstream costs to determine potential savings to agency budgets

(Aos, Lieb, Mayfield, Miller, and Pennucci, 2004; OMB, 1992). Several new efforts over the last 5 years have sought to promote the development of such estimates. One initiative that has gained substantial traction in the United States is the *Results First Project* supported by the Pew Charitable Trust and MacArthur Foundation (Dueffert, 2012). This initiative partners with states to implement an innovative benefit-cost approach that assists policy makers seeking to invest in programs that can reduce crime, improve health, and result in public savings. By building tailored models of how programs impact a particular state's budget, policy decisions can be made that are beneficial to both at-risk populations and local budgets (Dueffert, 2013).

In part, the value of approaches that seek to monetize program outcomes is borne out by the ability to make estimates transferable across settings (where the value of currency is likely shared across groups). The approach outlined by Manning et al. (2013) captures a more idiographic—and possibly accurate—estimate of a group's value of prevention programs, but this valuation is temporally and geographically bound. Specifically, a group of decision makers surveyed in one area or time may have a dramatically different valuation of a program than decision makers in another region at a different time. To use Manning et al.'s approach effectively to inform policy making, analysts will need to survey a larger sample of decision makers to develop more robust estimates. Furthermore, estimates will need to account for the larger body of prevention programs available in the marketplace. Although Manning et al. include more than 20 programs, policy makers may question valuation estimates that neglect commonly used or home-grown—even if ineffective—prevention programs. Ultimately, these programs may need to be included to facilitate decision maker buy-in.

In this context, there is a role for both utility approaches that elicit clear guidance for policy making as well as economic and fiscal analyses that place a monetary value on crime prevention programs. Next, I consider the importance of capturing infrastructure needs in program costs, the case for dual-generation programs, and promising approaches for investing in prevention.

Planning for Infrastructure and Capacity: The Costs of Developmental Crime Prevention

Recently, while accepting the 2013 Stockholm Prize in Criminology, Dr. David Farrington called for creation of national agencies to coordinate domestic prevention strategies (Farrington, 2013). Although he is not the first to recognize that the patchwork of developmental crime prevention programs spanning the globe is inadequate for meeting the needs of youth at risk, Professor Farrington went further to outline the form and function of such agencies. This outline included the (a) recognition that primary crime prevention efforts are largely missing in most countries, (b) the need for continuous funding of prevention programs, and (c) the importance of building local prevention capacity. At the core of Professor Farrington's

message was that the continued lack of infrastructure and capacity to support the delivery of developmental prevention programs is a major threat to successfully preventing crime.

A closer look at the existing criminal justice, law enforcement, and education systems quickly reveals the limited capacity of localities to install and implement effective and efficient prevention efforts successfully (Andréasson, Hjalmarsson, and Rehnman, 2000; Ringwalt et al., 2002; Spoth and Greenberg, 2011; Welsh, Sullivan, and Olds, 2009). For instance, most crime prevention is provided either when youth first enter the juvenile justice system (secondary prevention) or in an effort to prevent future recidivism (tertiary prevention; Farrington, 2013).These efforts are generally delivered in the context of the criminal justice system. In contrast, primary crime prevention programs have little or no natural home (Dunworth, Mills, Cordner, and Greene, 1999; Hawkins and Weis, 1985; Hawkins et al., 2008; Spoth, Greenberg, Bierman, and Redmond, 2004). Schools generally have too many competing priorities to provide potent crime prevention efforts, and law enforcement personnel are rarely given the resources to implement effective crime prevention strategies among populations that have yet to commit a crime (Dunworth et al., 1999; Spoth et al., 2004).

Developmental crime prevention programs delivered without appropriate levels of infrastructure and capacity not only are at risk for failing but also clutter a crowded marketplace. They contribute to a belief that prevention, although it is a nice idea, has weak effects at best (Caulkins, Pacula, Paddock, and Chiesa, 2004; Spence and Shortt, 2007). In reality, developmental prevention programs that have been delivered with fidelity and have received adequate resources are not only effective but also cost effective (Barnett and Masse, 2007; Dino, Horn, Abdulkadri, Kalsekar, and Branstetter, 2008; Foster, Jones, and the Conduct Problems Prevention Research Group, 2006; Guyll et al., 2011; Kuklinski et al., 2012; Reynolds et al., 2011). Also, these programs face the same loss of potency that many effective medical interventions experience when delivered in parts of the world without the requisite infrastructure (electricity and refrigeration) and capacity (medical knowledge and reliable staff; Woolf, 2005). The Bill and Melinda Gates Foundation's work with disseminating malaria vaccines is a clear example of the value of local infrastructure and capacity (Litzow and Bauchner, 2006).

Although Manning et al.'s (2013) work focuses on how to value prevention programs, researchers and policy makers alike must ask: What does an effective infrastructure for crime prevention programs look like, and what will it cost? The reality of investing in human development means that effective and efficient prevention efforts cannot succeed in environments with unstable or mismanaged funding streams (Johnson, Hays, Center, and Daley, 2004; Scheirer and Dearing, 2011). To build efficient prevention efforts, investments also must support building local infrastructure and developing sustainable efforts with diverse funding streams that, when possible, recapture downstream savings for reinvestment (Catalano, 2007; Crowley et al., 2012). To accomplish this goal, first researchers will need to provide a clear estimate of these costs.

Investing Across Ecological Systems: The Case for Dual Generation

As described by Manning et al. (2013), the economic benefits of developmentally based prevention programs for crime and health are notoriously difficult to monetize (Karoly, 2008). Numerous barriers are holding the field back in this area, but the primary obstacle stems from the difficulty in linking outcomes in childhood to future economic impact (Crowley et al., 2013; Karoly, 2011). Early delinquency often occurs initially within the home and then in primary school where costs are low and difficult to quantify (likely in the form of lost parent or teacher productivity; Karoly, 2008; Karoly et al., 1998). These costs often are only apparent for the severest youth—until adolescence—when the rate of and harm from delinquent behavior grows exponentially (Conduct Problems Prevention Research Group, 1992; Foster and Jones, 2007). Furthermore, the greatest economic impacts from criminal activity tend not to become manifest until youth enter the labor force or the criminal justice system (Bongers, Koot, van der Ende, and Verhulst, 2004; Cohen, Piquero, and Jennings, 2010; Hao and Woo, 2012; Heckman et al., 2010). Consequently, the delayed benefits to youth from prevention programs makes investing in new developmental efforts difficult not only from a budgetary standpoint but also from a political one (Welsh and Farrington, 2012). Interestingly, some forms of developmental crime prevention programs seek to target not only youth but also their families (St. Pierre, Layzer, and Barnes, 1995). Growing out of ecological systems theory, which holds that human development is impacted by several environmental systems, researchers have found these "dual-generation" approaches could result not only in long-term savings from youth benefits but also in more immediate economic and fiscal savings from parent benefits (Bronfenbrenner, 1986; Miller, 2013; Sommer et al., 2012).

In practice, dual-generation approaches comprise efforts that combine high-quality early education programs for youth with opportunities for parents to participate in workforce development and parent training programs (Foundation for Child Development, 2012). In this manner, benefits accrue not only in the long term for youth but also in the near term for parents. In turn, these improved parent outcomes augment developmental gains from early education programs (e.g., socioeconomic, health, and parenting; Yoshikawa, Aber, and Beardslee, 2012). One commonly cited example is the Nurse Family Partnership program. In this program, public savings accrue not only from children when they reach adolescence (greater than 25% reduction in arrest between 12 and 15 years of age) but also beginning directly after delivery from parents (more than $8,000 in additional tax revenue in 2013 dollars, 33% reduction in welfare use; Karoly et al., 1998; Miller, 2013). Importantly, Manning et al. (2013) found similar support for dual-generation approaches using the AHP method, where programs that deliver preventive services in preschool and incorporate family interventions were the most preferred option.

In this manner, dual-generation approaches can make developmental crime prevention programs more appealing to decision makers seeking to demonstrate the value of their

investments in the near term. Furthermore, knowing that a sizable proportion of a crime prevention program's return will occur within the first few years after the initial investment can buffer its impact on tight government budgets. Therefore, this knowledge leads us to two innovative approaches for investing in and sustaining developmental crime prevention programs: prevention portfolios and social impact bonds.

Hedging Our Bets: Building Prevention Portfolios and the Promise of Social Impact Bonds

Global austerity efforts have forced policy makers to both cut services and avoid investing in programs that carry even a relatively low risk of failure. In response, many policy makers across the political spectrum desire robust estimates of a program's potential benefits and costs before they are willing to support new policies (The Pew Charitable Trusts, 2012). In response, innovative approaches for funding new programs and lowering risk to the taxpayer are gaining traction.

One such approach is the development of investment portfolios comprised of many prevention programs. These portfolios offer policy makers a variety of programs with different returns-on-investment (ROIs) and different levels of risk (Aos et al., 2004, 2011; Drake, Aos, and Miller, 2009; Lee et al., 2012). In this manner, policy makers can make explicit asset allocation decisions for each program in the portfolio. One example of such an approach comes from the Washington State Institute for Public Policy (WSIPP). To build these profiles, WSIPP has conducted large-scale meta-analyses to develop high-quality estimates of programs' potential ROI and has engaged in sophisticated work modeling the risk of a program failing to produce expected savings. Like traditional financial portfolios, this approach distributes risk across different areas (e.g., primary, secondary, and tertiary prevention) to protect the principal investment. WSIPP has delivered these estimates to the legislature over the years and has increased state investment in prevention dramatically (Dueffert, 2012). As a result, the state has observed meaningful declines in crime and incarceration—to the extent it avoided planned prison construction. The success of this model was the inspiration behind the Results First Initiative described previously and is being replicated across many U.S. states and internationally (Dueffert, 2013).

In contrast to the portfolio approach that relies on public investment in developmentally based prevention, there is growing interest by many governments in offering the private sector incentives to invest in social welfare programs. One strategy that is gaining increasing support is known as a "social impact bond" (also known as a "social benefit bond," "social policy bond," or "pay-for-success bond"). These bonds are offered by governments to private investors to support prevention programs known to have a high ROI (Horesh, 2000; Liebman, 2013; Liebman and Sellman, 2013). The program is delivered by an intermediary supported by the private investors' funds. If the program is successful in delivering public savings, then the private investors receive both their principal investment and a predefined return (similar to a structured product or equity investment). The first

social impact bond was developed by Social Finance UK in 2010. Since then, Australia and the United States have both observed offerings of social impact bonds (e.g., Massachusetts, New York City, and New South Wales). These trials are being closely watched for evidence that this new funding mechanism could be effectively used to support and incentivize efficient developmentally based crime prevention efforts.

Conclusions

Manning et al.'s (2013) valuation approach allows for a systematic comparison of developmental crime prevention programs and has the potential to fill a major gap in current efforts to value prevention for informing public policy. By further considering the economics of investing in developmental crime prevention programs, we can identify multiple actionable steps for research and policy. Combined, they offer the opportunity to build more efficient crime prevention efforts that will lead to substantial future savings. These steps are as follows:

1. Replicate Manning et al.'s valuation approach (a) in new settings, (b) with new populations, and (c) with a broader array of crime prevention programs.
2. Develop robust estimates of the costs from implementing and scaling developmental crime prevention programs.
3. Invest in dual-generation interventions that deliver prevention programs to both youth and their families.
4. Engage innovative mechanisms for investing in crime prevention efforts, including the development of prevention portfolios and social impact bonds.

In this context, policy makers wishing to install effective and efficient developmental crime programs into current crime prevention and control efforts should consider the utility of Manning et al.'s (2013) AHP approach and encourage replication of the process among their peers. Furthermore, policy makers should carefully consider the available programming infrastructure and capacity in target areas, the use of dual-generation programs, and innovative investment strategies that protect public resources from risk.

References

Andréasson, Sven, Kerstin Hjalmarsson, and Charlotta Rehnman. 2000. Implementation and dissemination of methods for prevention of alcohol problems in primary health care: A feasibility study. *Alcohol and Alcoholism*, 35: 525–530.

Andrews, Don A. and James Bonta. 2010. Rehabilitating criminal justice policy and practice. *Psychology, Public Policy and Law*, 16: 39–55.

Aos, Steve, Stephanie Lee, Elizabeth K. Drake, Annie Pennucci, Tali Klima, Marna G. Miller, et al. 2011. *Return on Investment: Evidence-Based Options to Improve Statewide Outcomes*. Olympia: Washington State Institute for Public Policy. Retrieved from wsipp.wa.gov/pub.asp?docid=11-07-1201.

Aos, Steve, Roxanne Lieb, Jim Mayfield, Marna G. Miller, and Annie Pennucci. 2004. *Benefits and Costs of Prevention and Early Intervention Programs for Youth*. Olympia: Washington State Institute for Public Policy. Retrieved from wsipp.wa.gov/pub.asp?docid=04-07-3901.

Artello, Kristine. 2013. Shifting "tough on crime" to keeping kids out of jail: Exploring organizational adaptability and sustainability at a mental health agency serving adjudicated children living with severe mental illness. *Criminal Justice Policy Review*. E-pub ahead of print. doi: 10.1177/0887403412473473.

Barnett, W. Steven and Leonard N. Masse. 2007. Comparative benefit–cost analysis of the Abecedarian program and its policy implications. *Economics of Education Review*, 26: 113–125.

Becker, Gary S. 1968. Crime and punishment: An economic approach. *Journal of Political Economy*, 76: 169–217.

Birch, Stephen and Amiram Gafni. 1992. Cost effectiveness/utility analyses: Do current decision rules lead us to where we want to be? *Journal of Health Economics*, 11: 279–296.

Bongers, Ilja L., Hans M. Koot, Jan van der Ende, and Frank C. Verhulst. 2004. Developmental trajectories of externalizing behaviors in childhood and adolescence. *Child Development*, 75: 1523–1537.

Braga, Anthony A. and David L. Weisburd. 2011. The effects of focused deterrence strategies on crime: A systematic review and meta-analysis of the empirical evidence. *Journal of Research in Crime and Delinquency*, 49: 323–358.

Bronfenbrenner, Urie. 1986. Ecology of the family as a context for human development: Research perspectives. *Developmental Psychology*, 22: 723–742.

Brookshire, David S. and Thomas D. Crocker. 1981. The advantages of contingent valuation methods for benefit-cost analysis. *Public Choice*, 36: 235–252. Retrieved March 15, 2011 from jstor.org/stable/30023439.

Cameron, Samuel. 1988. The economics of crime deterrence: A survey of theory and evidence. *Kyklos*, 41: 301–323.

Catalano, Richard F. 2007. Prevention is a sound public and private investment. *Criminology & Public Policy*, 6: 377–397.

Caulkins, Jonathan P., Rosalie Liccardo Pacula, Susan Paddock, and James Chiesa. 2004. What we can—and cannot—expect from school-based drug prevention. *Drug and Alcohol Review*, 23: 79–87.

Cohen, Mark A. 1988. Pain, suffering, and jury awards: A study of the cost of crime to victims. *Law & Society Review*, 22: 537–556.

Cohen, Mark A. 2005. *The Costs of Crime and Justice*. London, U.K.: Routledge.

Cohen, Mark A., Alex R. Piquero, and Wesley G. Jennings. 2010. Studying the costs of crime across offender trajectories. *Criminology & Public Policy*, 9: 279–305.

Conduct Problems Prevention Research Group. 1992. A developmental and clinical model for the prevention of conduct disorders. *Development and Psychopathology*, 4: 509–527.

Crowley, D. Max, Laura Griner Hill, Margaret R. Kuklinski, and Damon E. Jones. 2013. Research priorities for economic analyses of prevention: Current issues & future directions. *Prevention Science*. E-pub ahead of print. doi: 10.1007/s11121-013-0429-z.

Crowley, D. Max, Damon E. Jones, Mark. T. Greenberg, Mark E. Feinberg, and Richard L. Spoth. 2012. Resource consumption of a diffusion model for prevention programs: The PROSPER delivery system. *Journal of Adolescent Health*, 50: 256–263.

Dino, Geri, Kimberly Horn, Abdullahi Abdulkadri, Iftekhar Kalsekar, and Steven Branstetter. 2008. Cost-effectiveness analysis of the Not on Tobacco program for adolescent smoking cessation. *Prevention Science*, 9(1): 38–46. doi:10.1007/s11121-008-0082-0

Dodge, Kenneth A. 2001. The science of youth violence prevention. *American Journal of Preventive Medicine*, 20: 63–70.

Donaldson, Cam, Stephen Birch, and Amiram Gafni. 2002. The distribution problem in economic evaluation: Income and the valuation of costs and consequences of health care programmes. *Health Economics*, 11: 55–70.

Donaldson, Cam, Shelley Farrar, Tracy Mapp, Andrew Walker, and Susan Macphee. 1997. Assessing community values in health care: Is the "willingness to pay" method feasible? *Health Care Analysis*, 5: 7–29.

Drake, Elizabeth K., Steve Aos, and Marna G. Miller. 2009. Evidence-based public policy options to reduce crime and criminal justice costs: Implications in Washington State. *Victims & Offenders*, 4: 170–196.

Dueffert, Nicole. 2012. *Better Results, Lower Costs: Washington State's Cutting-Edge Policy Analysis Model*. Washington, DC: The Pew Center on the States. Retrieved from pewstates.org/uploadedFiles/PCS_Assets/2012/ResultsFirst_Washington_casestudy.pdf.

Dueffert, Nicole. 2013. *States' Use of Cost-Benefit Analysis: Improving Results for Taxpayers*. Pew-Macarthur Results First Initiative. Washington, DC: The Pew Center on the States. Retrieved from pewstates.org/uploadedFiles/PCS_Assets/2013/Pew_Results_First_50state_report.pdf.

Dunworth, Terence, Gregory Mills, Gary Cordner, and Jack Greene. 1999. *National Evaluation of Weed and Seed Cross-Site Analysis*. Washington, DC: U.S. Department of Justice. Retrieved from ncjrs.gov/txtfiles1/176358.txt.

Durlak, Joseph A. 1998. Common risk and protective factors in successful prevention programs. *American Journal of Orthopsychiatry*, 68: 512–520.

Eckenrode, John, Mary Campa, Dennis W. Luckey, Charles R. Henderson, Jr., Robert Cole, Harriet Kitzman, et al. 2010. Long-term effects of prenatal and infancy nurse home visitation on the life course of youths: 19-year follow-up of a randomized trial. *Archives of Pediatrics &Adolescent Medicine*, 164: 9–15.

Farrington, David P. 1994. Early developmental prevention of juvenile delinquency. *RSA Journal*, 142: 22–34.

Farrington, David P. 2013. *Saving Children from a Life of Crime: The Benefits Greatly Outweigh the Costs!* Presented at the Stockholm Price in Criminology, Stockholm, Sweden. Retrieved from criminologysymposium.com/.

Foster, E. Michael and Damon E. Jones. 2007. The economic analysis of prevention: An illustration involving children's behavior problems. *The Journal of Mental Health Policy and Economics*, 10: 165–175.

Foster, E. M., D. Jones, & and the Conduct Problems Prevention Research Group. 2006. Can a costly intervention be cost-effective?: An analysis of violence prevention. *Archives of General Psychiatry*, 63: 1284–1291. doi:10.1001/archpsyc.63.11.1284

Foundation for Child Development. 2012. *Investing in Public Programs Matters: How State Policies Impact Children's Lives*. New York: Author. Retrieved from resourcecentre.savethechildren.se/sites/default/files/documents/5551.pdf.

Gifford-Smith, Mary, Kenneth A. Dodge, Thomas J. Dishion, and Joan McCord. 2005. Peer influence in children and adolescents: Crossing the bridge from developmental to intervention science. *Journal of Abnormal Child Psychology*, 33: 255–265.

Guyll, Max, Richard L. Spoth, and Daniel Max Crowley. 2011. Economic analysis of methamphetamine prevention effects and employer costs. *Journal of Studies on Alcohol and Drugs*, 72: 577–585.

Hao, Lingxin and Han S. Woo. 2012. Distinct trajectories in the transition to adulthood: Are children of immigrants advantaged? *Child Development*, 83: 1623–1639.

Hawkins, J. David, Richard F. Catalano, Michael W. Arthur, Elizabeth Egan, Eric C. Brown, Robert D. Abbott, et al. 2008. Testing communities that care: The rationale, design and behavioral baseline equivalence of the community youth development study. *Prevention Science*, 9: 178–190.

Hawkins, J. David, Richard F. Catalano, and Janet Y. Miller. 1992. Risk and protective factors for alcohol and other drug problems in adolescence and early adulthood: Implications for substance abuse prevention. *Psychological Bulletin*, 112: 64–105.

Hawkins, J. David and Joseph G. Weis. 1985. The social development model: An integrated approach to delinquency prevention. *The Journal of Primary Prevention*, 6: 73–97.

Heckman, James J. 2006. Skill formation and the economics of investing in disadvantaged children. *Science*, 312: 1900–1902.

Heckman, James J., Seong Hyeok Moon, Rodrigo Pinto, Peter A. Savelyev, and Adam Yavitz. 2010. The rate of return to the High Scope Perry Preschool Program. *Journal of Public Economics*, 94: 114–128.

Homel, Ross. 2013. Developmental crime prevention. In (Nick Tilley, ed.), *Handbook of Crime Prevention Community Safety*. London, U.K.: Routledge.

Horesh, Ronnie. 2000. Injecting incentives into the solution of social problems: Social policy bonds. *Economic Affairs*, 20: 39–42.

Johnson, Knowlton, Carol Hays, Hayden Center, and Charlotte Daley. 2004. Building capacity and sustainable prevention innovations: A sustainability planning model. *Evaluation and Program Planning*, 27: 135–149.

Karoly, Lynn A. 2008. *Valuing Benefits in Benefit-Cost Studies of Social Programs*. Technical Report. Santa Monica, CA: The RAND Corporation. Retrieved from rand.org/content/dam/rand/pubs/technical_reports/2008/RAND_TR643.pdf.

Karoly, Lynn A. 2011. Toward standardization of benefit-cost analyses of early childhood interventions. *SSRN Electronic Journal*.

Karoly, Lynn A., Peter W. Greenwood, Susan S. Everingham, Jill Houbé, M. Rebecca Kilburn, C. Peter Rydell, et al. 1998. *Investing in Our Children: What We Know and Don't Know About the Costs and Benefits of Early Childhood Interventions*. Santa Monica, CA: The RAND Corporation.

Kelly, Michael, Antony Morgan, Simon Ellis, Tricia Younger, Jane Huntley, and Catherine Swann. 2010. Evidence based public health: A review of the experience of the National Institute of Health and Clinical Excellence (NICE) of developing public health guidance in England. *Social Science & Medicine*, 71: 1056–1062.

Klietz, Stephanie J., Charles M. Borduin, and Cindy M. Schaeffer. 2010. Cost-benefit analysis of multisystemic therapy with serious and violent juvenile offenders. *Journal of Family Psychology*, 24: 657–666.

Kuklinski, Margaret R., John S. Briney, J. David Hawkins, and Richard F. Catalano. 2012. Cost-benefit analysis of Communities That Care outcomes at eighth grade. *Prevention Science*, 13: 150–161.

Lee, Stephanie, Steve Aos, Elizabeth K. Drake, Annie Pennucci, Marna G. Miller, and Laurie Anderson. 2012. *Return on Investment: Evidence-Based Options to Improve Statewide Outcomes April 2012 Update*. Olympia: Washington State Institute for Public Policy. Retrieved from wsipp.wa.gov/pub.asp?docid=12-04-1201.

Lerner, Richard M., Jacqueline V. Lerner, Jason B. Almerigi, Christina Theokas, Erin Phelps, Steinunn Gestsdottir, et al. 2005. Positive youth development, participation in community youth development programs, and community contributions of fifth-grade adolescents: Findings from the first wave of the 4-H Study of Positive Youth Development. *The Journal of Early Adolescence*, 25: 17–71.

Liebman, Jeffrey B. 2013. *Building on Recent Advances in Evidence-Based Policymaking*. Washington, DC: Brookings Institution.

Liebman, Jeffrey B. and Alina Sellman. 2013. *Social Impact Bonds: A Guide for State and Local Governments*. Cambridge, MA: Harvard Kennedy School Social Impact Bond Technical Assistance Lab.

Litzow, Jennifer M. and Howard Bauchner. 2006. The grand challenges of the Gates Foundation: What impact on global child health? *Journal of the Royal Society on Medicine*, 99: 171–174.

Ludwig, Jens. 2010. The costs of crime. *Criminology & Public Policy*, 9: 307–311.

Ludwig, Jens and Philip J. Cook. 2001. The benefits of reducing gun violence: Evidence from contingent-valuation survey data. *Journal of Risk and Uncertainty*, 22: 207–226.

Manning, Matthew, Christine Smith, and Ross Homel. 2013. Valuing developmental crime prevention. *Criminology & Public Policy*, 12: 305–332.

Marsh, Kevin, Aaron Chalfin, and John K. Roman. 2008. What does cost-benefit analysis add to decision making? Evidence from the criminal justice literature. *Journal of Experimental Criminology*, 4: 117–135.

McCollister, Kathryn E., Michael T. French, and Hai Fang. 2010. The cost of crime to society: New crime-specific estimates for policy and program evaluation. *Drug and Alcohol Dependence*, 108: 98–109.

Miller, Ted R. 2013. *Nurse-Family Partnership Home Visitation: Costs, Outcomes, and Return on Investment*. Bethesda, MD: HBSA Inc. Retrieved from pew-states.org/uploadedFiles/PCS_Assets/2013/Costs_and_ROI_report.pdf.

Miller, Ted R., Mark A. Cohen, and Shelli B. Rossman. 1993. Victim costs of violent crime and resulting injuries. *Health Affairs*, 12: 186–197.

O'Connell, Mary Ellen, Thomas F. Boat, and Kenneth E. Warner. 2009. *Preventing Mental, Emotional, and Behavioral Disorders Among Young People: Progress and Possibilities*. Washington, DC: National Academies Press.

Office of Management & Budget (OMB). 1992. *Guidelines and Discount Rates for Benefit-Cost Analysis of Federal Programs* (No. A-94). Washington, DC: Author. Retrieved from whitehouse.gov/sites/default/files/omb/assets/a94/a094.pdf.

Olsen, Jan Abel and Richard D. Smith. 2001. Theory versus practice: A review of "willingness-to-pay" in health and health care. *Health Economics*, 10: 39–52.

Osgood, D. Wayne. 2005. Making sense of crime and the life course. *The ANNALS of the American Academy of Political and Social Science*, 602: 196–211.

Paternoster, Raymond. 2010. How much do we really know about criminal deterrence? *Journal of Criminal Law and Criminology*, 100: 765–823.

Reynolds, Arthur J., Judy A. Temple, Barry A. B. White, Suh-Ruu Ou, and Dylan L. Robertson. 2011. Age 26 cost-benefit analysis of the Child-Parent Center Early Education Program. *Child Development*, 82: 379–404.

Rikard, R. V. and E. D. Rosenberg. 2007. Aging inmates: A convergence of trends in the American criminal justice system. *Journal of Correctional Health Care*, 13: 150–162.

Ringwalt, Christopher L., Susan T. Ennett, Amy A. Vincus, Judy Thorne, Louise Ann Rohrbach, and Ashley Simmons-Rudolph, A. 2002. The prevalence of effective substance use prevention curricula in U.S. middle schools. *Prevention Science*, 3: 257–265.

Ryan, Mandy and Verity Watson. 2009. Comparing welfare estimates from payment card contingent valuation and discrete choice experiments. *Health Economics*, 18: 389–401.

Saaty, Thomas L. 1988. What is the analytic hierarchy process. In (Gautam Mitra, ed.), *Mathematical Models and Decision Support*. Berlin, Germany: Springer.

Scheirer, MaryAnn and James W. Dearing. 2011. An agenda for research on the sustainability of public health programs. *American Journal of Public Health*, 101: 2059–2067.

Sommer, Teresa Eckrich, P. Lindsay Chaise-Lansdale, Jeanne Brooks-Gunn, Margo Gardner, Diana Mendley Rauner, and Karen Freel. 2012. Early childhood education centers and mothers' postsecondary attainment: A new conceptual framework for a dual-generation education intervention. *Teachers College Record*, 114: 1–40.

Spence, Susan H. and Alison L. Shortt. 2007. Research review: Can we justify the widespread dissemination of universal, school-based interventions for the prevention of depression

among children and adolescents? *Journal of Child Psychology and Psychiatry*, 48: 526–542.

Spoth, Richard L. and Mark T. Greenberg. 2011. Impact challenges in community science-with-practice: Lessons from PROSPER on transformative practitioner-scientist partnerships and prevention infrastructure development. *American Journal of Community Psychology*, 48: 106–119.

Spoth, Richard L., Mark T. Greenberg, Karen Bierman, and Cleve Redmond. 2004. PROSPER community–university partnership model for public education systems: Capacity-building for evidence-based, competence-building prevention. *Prevention Science*, 5: 31–39.

St. Pierre, Robert G., Jean I. Layzer, and Helen V. Barnes. 1995. Two-generation programs: Design, cost, and short-term effectiveness. *The Future of Children*, 5: 76–93.

The Pew Charitable Trusts. 2012. Results First Initiative [homepage]. Retrieved from pewstates.org/projects/results-first-328069.

Vitiello, Michael. 2013. Still between a rock and a hard place: Sentencing reform in California. *Federal Sentencing Reporter*, 25: 233–235.

Weatherly, H., M. Drummond, K. Claxton, K. Cookson, B. Ferguson, C. Godfrey, et al. 2009. Methods for assessing the cost-effectiveness of public health interventions: Key challenges and recommendations. *Health Policy*, 93: 85–92.

Weinstein, Milton C. and Willard G. Manning, Jr. 1997. Theoretical issues in cost-effectiveness analysis. *Journal of Health Economics*, 16: 121–128.

Welsh, Brandon C. and David P. Farrington. 2010. *The Future of Crime Prevention: Developmental and Situational Strategies*. Bethesda, MD: National Institute of Justice.

Welsh, Brandon C. and David P. Farrington. 2012. Science, politics, and crime prevention: Toward a new crime policy. *Journal of Criminal Justice*, 40: 128–133.

Welsh, Brandon C., Christopher J. Sullivan, and David L. Olds. 2009. When early crime prevention goes to scale: A new look at the evidence. *Prevention Science*, 11: 115–125.

Woolf, Steven H. 2005. The break-even point: When medical advances are less important than improving the fidelity with which they are delivered. *The Annals of Family Medicine*, 3: 545–552.

Yoshikawa, Hirokazu, J. Lawrence Aber, and William R. Beardslee. 2012. The effects of poverty on the mental, emotional, and behavioral health of children and youth: Implications for prevention. *American Psychologist*, 67: 272–284.

Zarkin, Gary A., Sheryl C. Cates, and Mohan V. Bala. 2000. Estimating the willingness to pay for drug abuse treatment: A pilot study. *Journal of Substance Abuse Treatment*, 18: 149–159.

D. Max Crowley is a National Institute of Drug Abuse Fellow at Duke University's Center for Child and Family Policy studying the economics of investing in human development. His research program seeks to prevent the development of health inequalities and criminal behavior through evidence-based investments in childhood and adolescence. Dr. Crowley co-chairs the Society for Prevention Research's MAPS Taskforce on economic analyses of

prevention, is a research fellow at the National Bureau of Economic Research (NBER-Crime), and winner of the Research Society on Alcoholism's John T. and Patricia A. O'Neill Addiction Science Education Award. His work has been supported by the National Institute of Drug Abuse, NoVo Foundation, ACF's Office of Research, Planning and Evaluation, and the Robert Wood Johnson Foundation.