Submit only ONE copy of this form **for each PI/PD and co-PI/PD** identified on the proposal. The form(s) should be attached to the original proposal as specified in GPG Section II.C.a. Submission of this information is voluntary and is not a precondition of award. This information will not be disclosed to external peer reviewers. *DO NOT INCLUDE THIS FORM WITH ANY OF THE OTHER COPIES OF YOUR PROPOSAL AS THIS MAY COMPROMISE THE CONFIDENTIALITY OF THE INFORMATION.*

**PI/PD Name:**     Glenn   Firebaugh

**Gender:**                     ☒ Male              ☐ Female

**Ethnicity:** (Choose one response)     ☐ Hispanic or Latino     ☒ Not Hispanic or Latino

**Race:**
(Select one or more)
☐ American Indian or Alaska Native
☐ Asian
☐ Black or African American
☐ Native Hawaiian or Other Pacific Islander
☒ White

**Disability Status:**
(Select one or more)
☐ Hearing Impairment
☐ Visual Impairment
☐ Mobility/Orthopedic Impairment
☐ Other
☐ None

**Citizenship:**     (Choose one)     ☒ U.S. Citizen          ☐ Permanent Resident          ☐ Other non-U.S. Citizen

**Check here if you do not wish to provide any or all of the above information (excluding PI/PD name):**          ☒

**REQUIRED: Check here if you are currently serving (or have previously served) as a PI, co-PI or PD on any federally funded project**          ☒

**Ethnicity Definition:**
**Hispanic or Latino.** A person of Mexican, Puerto Rican, Cuban, South or Central American, or other Spanish culture or origin, regardless of race.
**Race Definitions:**
**American Indian or Alaska Native.** A person having origins in any of the original peoples of North and South America (including Central America), and who maintains tribal affiliation or community attachment.
**Asian.** A person having origins in any of the original peoples of the Far East, Southeast Asia, or the Indian subcontinent including, for example, Cambodia, China, India, Japan, Korea, Malaysia, Pakistan, the Philippine Islands, Thailand, and Vietnam.
**Black or African American.** A person having origins in any of the black racial groups of Africa.
**Native Hawaiian or Other Pacific Islander.** A person  having origins in any of the original peoples of Hawaii, Guam, Samoa, or other Pacific Islands.
**White.** A person having origins in any of the original peoples of Europe, the Middle East, or North Africa.

**WHY THIS INFORMATION IS BEING REQUESTED:**

The Federal Government has a continuing commitment to monitor the operation of its review and award processes to identify and address any inequities based on gender, race, ethnicity, or disability of its proposed PIs/PDs. To gather information needed for this important task, the proposer should submit a single copy of this form for each identified PI/PD with each proposal. Submission of the requested information is voluntary and will not affect the organization's eligibility for an award. However, information not submitted will seriously undermine the statistical validity, and therefore the usefulness, of information recieved from others. Any individual not wishing to submit some or all the information should check the box provided for this purpose. (The exceptions are the PI/PD name and the information about prior Federal support, the last question above.)

Collection of this information is authorized by the NSF Act of 1950, as amended, 42 U.S.C. 1861, et seq. Demographic data allows NSF to gauge whether our programs and other opportunities in science and technology are fairly reaching and benefiting everyone regardless of demographic category; to ensure that those in under-represented groups have the same knowledge of and access to programs and other research and educational oppurtunities; and to assess involvement  of international investigators in work supported by NSF. The information may be disclosed to government contractors, experts, volunteers and researchers to complete assigned work; and to other government agencies in order to coordinate and assess programs. The information may be added to the Reviewer file and used to select potential candidates to serve as peer reviewers or advisory committee members. See Systems of Records, NSF-50, "Principal Investigator/Proposal File and Associated Records", 63 Federal Register 267 (January 5, 1998), and NSF-51, "Reviewer/Proposal File and Associated Records", 63 Federal Register 268 (January 5, 1998).

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**PI/PD Name:**     Michael   Massoglia

**Gender:**     ☒ Male          ☐ Female

**Ethnicity:** (Choose one response)     ☐ Hispanic or Latino     ☒ Not Hispanic or Latino

**Race:**
(Select one or more)
☐ American Indian or Alaska Native
☐ Asian
☐ Black or African American
☐ Native Hawaiian or Other Pacific Islander
☒ White

**Disability Status:**
(Select one or more)
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☐ Visual Impairment
☐ Mobility/Orthopedic Impairment
☐ Other
☐ None

**Citizenship:**     (Choose one)     ☒ U.S. Citizen          ☐ Permanent Resident          ☐ Other non-U.S. Citizen

**Check here if you do not wish to provide any or all of the above information (excluding PI/PD name):**          ☒

**REQUIRED: Check here if you are currently serving (or have previously served) as a PI, co-PI or PD on any federally funded project**     ☐

**Ethnicity Definition:**
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# List of Suggested Reviewers or Reviewers Not To Include (optional)

**SUGGESTED REVIEWERS:**
**Not Listed**

**REVIEWERS NOT TO INCLUDE:**
**Not Listed**

Corrected : 02/03/2010

# COVER SHEET FOR PROPOSAL TO THE NATIONAL SCIENCE FOUNDATION

| PROGRAM ANNOUNCEMENT/SOLICITATION NO./CLOSING DATE/if not in response to a program announcement/solicitation enter NSF 10-1 | FOR NSF USE ONLY |
|---|---|
| **NSF 10-1**  01/15/10 | **NSF PROPOSAL NUMBER** |
| FOR CONSIDERATION BY NSF ORGANIZATION UNIT(S)   (Indicate the most specific unit known, i.e. program, division, etc.)  **SES  - LAW AND SOCIAL SCIENCES** | **1023725** |

| DATE RECEIVED | NUMBER OF COPIES | DIVISION ASSIGNED | FUND CODE | DUNS# (Data Universal Numbering System) | FILE LOCATION |
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| EMPLOYER IDENTIFICATION NUMBER (EIN) OR TAXPAYER IDENTIFICATION NUMBER (TIN)  **246000376** | SHOW PREVIOUS AWARD NO. IF THIS IS ☐ A RENEWAL ☐ AN ACCOMPLISHMENT-BASED RENEWAL | IS THIS PROPOSAL BEING SUBMITTED TO ANOTHER FEDERAL AGENCY?    YES ☐   NO ☒  IF YES, LIST ACRONYM(S) |
|---|---|---|

| NAME OF ORGANIZATION TO WHICH AWARD SHOULD BE MADE  **Pennsylvania State Univ University Park** | ADDRESS OF AWARDEE ORGANIZATION, INCLUDING 9 DIGIT ZIP CODE  **Pennsylvania State Univ University Park 110 Technology Center Building UNIVERSITY PARK, PA. 168027000** |
|---|---|
| AWARDEE ORGANIZATION CODE (IF KNOWN)  **0033290000** | |

| NAME OF PERFORMING ORGANIZATION, IF DIFFERENT FROM ABOVE | ADDRESS OF PERFORMING ORGANIZATION, IF DIFFERENT, INCLUDING 9 DIGIT ZIP CODE |
|---|---|
| PERFORMING ORGANIZATION CODE   (IF KNOWN) | |

| IS AWARDEE ORGANIZATION (Check All That Apply) (See GPG II.C For Definitions) | ☐ SMALL BUSINESS ☐ FOR-PROFIT ORGANIZATION | ☐ MINORITY BUSINESS ☐ WOMAN-OWNED BUSINESS | ☐ IF THIS IS A PRELIMINARY PROPOSAL THEN CHECK HERE |
|---|---|---|---|

TITLE OF PROPOSED PROJECT   **Ex-Inmates and Residential Segregation in America**

| REQUESTED AMOUNT  $     **206,012** | PROPOSED DURATION (1-60 MONTHS)  **24**  months | REQUESTED STARTING DATE  **07/01/10** | SHOW RELATED PRELIMINARY PROPOSAL NO. IF APPLICABLE |
|---|---|---|---|

CHECK APPROPRIATE BOX(ES) IF THIS PROPOSAL INCLUDES ANY OF THE ITEMS LISTED BELOW

☐ BEGINNING INVESTIGATOR (GPG I.G.2)
☐ DISCLOSURE OF LOBBYING ACTIVITIES (GPG II.C.1.e)
☐ PROPRIETARY & PRIVILEGED INFORMATION (GPG I.D, II.C.1.d)
☐ HISTORIC PLACES (GPG II.C.2.j)
☐ EAGER* (GPG II.D.2)      ☐ RAPID** (GPG II.D.1)
☐ VERTEBRATE ANIMALS (GPG II.D.6) IACUC App. Date _____
   PHS Animal Welfare Assurance Number _____

☒ HUMAN SUBJECTS (GPG II.D.7)  Human Subjects Assurance Number **00001534**
   Exemption Subsection _____ or IRB App. Date **Pending**
☐ INTERNATIONAL COOPERATIVE ACTIVITIES: COUNTRY/COUNTRIES INVOLVED
   (GPG II.C.2.j)
   _____
☐ HIGH RESOLUTION GRAPHICS/OTHER GRAPHICS WHERE EXACT COLOR REPRESENTATION IS REQUIRED FOR PROPER INTERPRETATION (GPG I.G.1)

| PI/PD DEPARTMENT  **Population Research Institute** | PI/PD POSTAL ADDRESS  **601 Oswald Tower** |
|---|---|
| PI/PD FAX NUMBER  **814-863-8342** | **University Park, PA 16802 United States** |

| NAMES (TYPED) | High Degree | Yr of Degree | Telephone Number | Electronic Mail Address |
|---|---|---|---|---|
| PI/PD NAME  **Glenn Firebaugh** | **PhD** | **1976** | **814-865-5001** | **firebaug@pop.psu.edu** |
| CO-PI/PD  **Michael Massoglia** | **PhD** | **2006** | **814-863-5509** | **mam74@psu.edu** |
| CO-PI/PD | | | | |
| CO-PI/PD | | | | |
| CO-PI/PD | | | | |

# CERTIFICATION PAGE

**Certification for Authorized Organizational Representative or Individual Applicant:**

By signing and submitting this proposal, the Authorized Organizational Representative or Individual Applicant is: (1) certifying that statements made herein are true and complete to the best of his/her knowledge; and (2) agreeing to accept the obligation to comply with NSF award terms and conditions if an award is made as a result of this application. Further, the applicant is hereby providing certifications regarding debarment and suspension, drug-free workplace, lobbying activities (see below), responsible conduct of research, nondiscrimination, and flood hazard insurance (when applicable) as set forth in the NSF Proposal & Award Policies & Procedures Guide, Part I: the Grant Proposal Guide (GPG) (NSF 10-1). Willful provision of false information in this application and its supporting documents or in reports required under an ensuing award is a criminal offense (U. S. Code, Title 18, Section 1001).

**Conflict of Interest Certification**

In addition, if the applicant institution employs more than fifty persons, by electronically signing the NSF Proposal Cover Sheet, the Authorized Organizational Representative of the applicant institution is certifying that the institution has implemented a written and enforced conflict of interest policy that is consistent with the provisions of the NSF Proposal & Award Policies & Procedures Guide, Part II, Award & Administration Guide (AAG) Chapter IV.A; that to the best of his/her knowledge, all financial disclosures required by that conflict of interest policy have been made; and that all identified conflicts of interest will have been satisfactorily managed, reduced or eliminated prior to the institution's expenditure of any funds under the award, in accordance with the institution's conflict of interest policy. Conflicts which cannot be satisfactorily managed, reduced or eliminated must be disclosed to NSF.

**Drug Free Work Place Certification**

By electronically signing the NSF Proposal Cover Sheet, the Authorized Organizational Representative or Individual Applicant is providing the Drug Free Work Place Certification contained in Exhibit II-3 of the Grant Proposal Guide.

**Debarment and Suspension Certification**          (If answer "yes", please provide explanation.)

Is the organization or its principals presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from covered transactions by any Federal department or agency?          Yes ☐          No ☒

By electronically signing the NSF Proposal Cover Sheet, the Authorized Organizational Representative or Individual Applicant is providing the Debarment and Suspension Certification contained in Exhibit II-4 of the Grant Proposal Guide.

**Certification Regarding Lobbying**

The following certification is required for an award of a Federal contract, grant, or cooperative agreement exceeding $100,000 and for an award of a Federal loan or a commitment providing for the United States to insure or guarantee a loan exceeding $150,000.

**Certification for Contracts, Grants, Loans and Cooperative Agreements**

The undersigned certifies, to the best of his or her knowledge and belief, that:
(1) No federal appropriated funds have been paid or will be paid, by or on behalf of the undersigned, to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with the awarding of any federal contract, the making of any Federal grant, the making of any Federal loan, the entering into of any cooperative agreement, and the extension, continuation, renewal, amendment, or modification of any Federal contract, grant, loan, or cooperative agreement.
(2) If any funds other than Federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with this Federal contract, grant, loan, or cooperative agreement, the undersigned shall complete and submit Standard Form-LLL, "Disclosure of Lobbying Activities," in  accordance with its instructions.
(3) The undersigned shall require that the language of this certification be included in the award documents for all subawards at all tiers including subcontracts, subgrants, and contracts under grants, loans, and cooperative agreements and that all subrecipients shall certify and disclose accordingly.

This certification is a material representation of fact upon which reliance was placed when this transaction was made or entered into.  Submission of this certification is a prerequisite for making or entering into this transaction imposed by section 1352, Title 31, U.S. Code.  Any person who fails to file the required certification shall be subject to a civil penalty of not less than $10,000 and not more than $100,000 for each such failure.

**Certification Regarding Nondiscrimination**

By electronically signing the NSF Proposal Cover Sheet, the Authorized Organizational Representative is providing the Certification Regarding Nondiscrimination contained in Exhibit II-6 of the Grant Proposal Guide.

**Certification Regarding Flood Hazard Insurance**

Two sections of the National Flood Insurance Act of 1968 (42 USC §4012a and §4106) bar Federal agencies from giving financial assistance for acquisition or construction purposes in any area identified by the Federal Emergency  Management Agency (FEMA) as having special flood hazards unless the:
(1)     community in which that area is located participates in the national flood insurance program; and
(2)     building (and any related equipment) is covered by adequate flood insurance.

By electronically signing the NSF Proposal Cover Sheet, the Authorized Organizational Representative or Individual Applicant located in FEMA-designated special flood hazard areas is certifying that adequate flood insurance has been or will be obtained in the following situations:
(1)     for NSF grants for the construction of a building or facility, regardless of the dollar amount of the grant; and
(2)     for other NSF Grants when more than $25,000 has been budgeted in the proposal for repair, alteration or improvement (construction) of a building or facility.

**Certification Regarding Responsible Conduct of Research (RCR)**
**(This certification is not applicable to proposals for conferences, symposia, and workshops.)**

By electronically signing the NSF Proposal Cover Sheet, the Authorized Organizational Representative of the applicant institution is certifying that, in accordance with the NSF Proposal & Award Policies & Procedures Guide, Part II, Award & Administration Guide (AAG) Chapter IV.B., the institution has a plan in place to provide appropriate training and oversight in the responsible and ethical conduct of research to undergraduates, graduate students and postdoctoral researchers who will be supported by NSF to conduct research.
The undersigned shall require that the language of this certification be included in any award documents for all subawards at all tiers.

| AUTHORIZED ORGANIZATIONAL REPRESENTATIVE | SIGNATURE | DATE |
|---|---|---|
| NAME<br>**Sherry L Yocum** | **Electronic Signature** | **Jan 15 2010  6:49AM** |
| TELEPHONE NUMBER<br>**814-863-8258** | ELECTRONIC MAIL ADDRESS<br>**yocum@pop.psu.edu** | FAX NUMBER<br>**814-863-8342** |

\* EAGER - EArly-concept Grants for Exploratory Research
\*\* RAPID - Grants for Rapid Response Research

PROJECT SUMMARY

Conspicuously missing from the literature on incarceration is a systematic quantitative assessment of the communities in which individuals live after they leave the institutional walls. If only because of legal restrictions that limit where many ex-felons can live, it is almost certainly the case that individuals leaving prison are clustered in more economically disadvantaged – and perhaps more racially homogeneous – neighborhoods. The United States has the highest incarceration rate in the world (Raphael 2007), and the aim of this study is to determine whether that high rate of incarceration is contributing to the socioeconomic and racial segregation of American neighborhoods.

**Intellectual Merit**

The project will address three related hypotheses. **The first hypothesis is that upon release ex-inmates tend to live in more socioeconomically disadvantaged neighborhoods, other things equal**. For two individuals with the same human and social capital (including a similar criminal record), the one who served time in prison is predicted to live in a worse neighborhood. **The second hypothesis is that incarceration affects the racial composition of the neighborhood that offenders select (or are selected into) after release from prison**. More specifically, the prediction is that, for two black felons who are otherwise equal, the one who served time in prison will live in a more homogeneously black neighborhood. **The third hypothesis is that the effect of incarceration on neighborhood composition increases over the years after release from prison.** Incarceration fractures social bonds, stunts economic and labor market opportunities, and diminishes social chances. These detrimental effects are expected to cumulate over time and result in diminished housing opportunities. As a result, ex-inmates increasingly cluster in a few residential areas the longer they have been out of prison, and these areas are predicted to be economically substandard and (at least for blacks) racially homogeneous.

**Broader Impacts**

At any given point in time, one of every 100 American adults is incarcerated (PEW 2008). Even more sobering is that 16 percent of black male adults have served time in prison at some point in their lives (Bonczar 2003), and Pettit & Western (2004) project that one of every four African-American men will be incarcerated in his lifetime. The lasting implications of these social facts for American society have yet to be realized. Although the average length of a prison sentence is slightly less than five years, the repercussions can last a lifetime. There is evidence that incarceration reduces job prospects (Pager 2003), depresses earnings (Western 2002), and causes a host of health problems (Massoglia 2008). The proposed project adds a community dimension to the discussion. Indeed, the proposed project is the first to use GIS and other appropriate methods to assess, systematically, the communities to which inmates return after serving their sentences. Nationally representative panel data are used to provide an account of where ex-inmates live. That accounting is then used to provide the first rigorous assessment of how much, if at all, the expansion of the penal state has exacerbated the residential segregation of Americans along socioeconomic and racial lines. In short, this research addresses the question of whether incarceration, through its role in promoting residential segregation, has had a broader impact on the social organization of American communities than has been previously recognized.

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| Current and Pending Support | 2 | |
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Appendix Items:

PROJECT DESCRIPTION

**BROADER IMPACT: THE ISSUES WE ADDRESS, AND WHY THEY ARE IMPORTANT**

We want to make three points in this section regarding the broader impact of our proposed research. 1) The rapid expansion of the correctional system over the past three decades is one of the most significant and dramatic trends in contemporary American society. To some extent, this growth reflected an across-the-board expansion of the penal state, but this growth has also resulted in a greatly increased incarceration risk for well-defined segments of the population. 2) While there is a growing research literature that highlights the role of incarceration as an important source of differential life chances for ex-inmates and their families (see the overviews of Petersilia 2003; Travis 2005), there is less research on how the "prison boom" has affected communities. The proposed research reverses the more commonly investigated causal arrow that posits: community disadvantage → risk of imprisonment.  The proposed research, by contrast, investigates how imprisonment itself might have a feedback effect on community disadvantage, possibly leading to a vicious circle of high incarceration rates → community disadvantage → high incarceration rates. 3) The quadrupling of the prison population since the mid-1970s largely reflects policy choices. Because the expansion was created largely by public policy, the expansion can also be reversed by public policy, and the social costs investigated here are consequential for that decision.

With regard to our first point, about 1 in every 100 American adults is now behind bars (PEW 2008).[1] Of these, somewhat over two-thirds are in state or federal prison custody, and just under one-third are in local jails. Each year there are more individuals released from prison (over 650,000) than there are males who graduate from four-year colleges (Mauer 2006; National Center for Educational Statistics 2004).  Put another way, those who are released from prison *each year* comprise a population larger than the city populations of Boston, Massachusetts or Washington D.C.

While incarceration rates have been rising for both men and women, men account for the overwhelming majority of the increase in the prison population (Raphael & Stoll 2009).  And within the male population, the increase has been further concentrated among men ages 25 to 40, and black men in particular (Raphael 2007).

This disproportionate increase in the incarceration of young minority men leads to our second key point: That rising incarceration rates might have important consequences for the racial and socioeconomic makeup of neighborhoods. The issue is not just what happens in prison, but what follows prison. The ballooning of the inmate population is followed inevitably by the ballooning of the ex-inmate population. In one assessment of this growth in the population of inmates and ex-inmates, Uggen et al. (2006) argue that correctional policies have caused the emergence of a new "felon class" in society, which, while comprising slightly more than 7 percent of the total adult population, comprises fully 22.3 percent of the black adult population and 33.4 percent of the black adult male population.  Given these numbers, we would expect blacks to be disproportionately affected by the growth in the prison population, and indeed research has shown this to be the case: With respect to the labor market (Pager 2003), marriage (Staples1987; Wilson 1990), and health (Massoglia 2008), the effects of incarceration are disproportionately felt by minorities and by minority communities.

Because this project focuses on the consequences for the communities where ex-inmates reside, the first item of business is to determine where ex-inmates lived before, and where they live now. As we explain below, this requires access to restricted data from the Bureau of Labor Statistics. Until now, knowledge

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[1] On the basis of figures such as these, Uggen & Manza (2002) have argued that the expansion of the penal state has affected the outcome of some state and national elections.

about ex-inmates' residence has been hindered by the scarcity of representative longitudinal data with measures of both incarceration and residential location for the nation as a whole; the evidence that we have consists largely of anecdotal first-person accounts of life after release or is based on localized samples (see e.g. Maruna 2001).

The general lack of systematic evidence on where ex-inmates live is particularly problematic in light of concerns not only about the lasting effects of incarceration on the incarcerated and their families, but also about the enduring effects of the widespread incarceration of minorities on the racial and socioeconomic makeup of neighborhoods. Although black-white segregation has declined recently (Scopilliti & Iceland 2008), we hypothesize in this proposal that the decline in segregation might have been somewhat steeper had incarceration rates not risen over the past three decades. Compared to a white male, an African-American male is at least five times more likely to be incarcerated during his lifetime (Pettit & Western 2004) and, because incarceration limits residential options after release, we argue below that the disproportionate incarceration of blacks might be slowing black-white residential integration in the United States. If our hypotheses are correct, the implications could be far-reaching since there is evidence linking racial residential segregation to a host of racial disparities in America, including lower birthweight for black infants (Ellen 2000), generally poorer health among black adults (William & Collins 2001), greater exposure to crime, environmental hazards, and food deserts, and inferior municipal services and health care settings, for minorities (Acevedo-Garcia & Lochner, 2003; Williams, 2001), and lower minority achievements in education, income, and employment rates (Ananat, 2007; Cutler & Glaeser, 1997). Cutler and Glaeser, for example, conclude that a one-standard deviation reduction in segregation would eliminate one-third of the black-white differences in education and employment outcomes.

The third point we want to stress here is that the possibly harmful societal consequences of the imprisonment boom are not inevitable, but are the result of what William Spelman (2000) characterizes as one of the largest *policy* experiments of the 20th Century. The quadrupling of the prison population in the last three decades of the century was due, not to a quadrupling (or even a dramatic increase) of criminal activity, but to "collective public choices regarding sentencing and punishment" (Raphael 2007, p. 13). Raphael concludes that 83 percent of the increase in incarceration was due to two factors: first, a greater risk of imprisonment among those who committed offenses that in the past would not have resulted in a prison sentence; second, longer sentences for those who would have been imprisoned in past years.

Because the steep rise in the prison population in the U.S. was largely policy-driven, its decline could also be policy-driven. Of course, with respect to sentencing policy, policymakers must try to strike the right balance between public safety and the costs of incarceration. Many have begun to question the current balance in the U.S., pointing to the escalating demands on the public funds caused by the rising costs of the prison system – funds that could be used for education, health, and any number of other public goods and services (PEW 2008).

We contribute to the discussion by investigating possible *social* costs of incarceration that have been largely overlooked – the contribution of ex-inmates to the racial and socioeconomic makeup of neighborhoods. If the effects are small, the social costs nonetheless could be significant, given the importance of the racial and economic makeup of neighborhoods to American life. On the other hand, large effects certainly would not imply that all punishment should be unilaterally decreased. Because public safety is paramount in the public eye – generally trumping all other considerations – for policy purposes the social costs of incarceration are pertinent only for convictions where the offender poses no serious physical threat to the public. The key, then, is to examine the consequences of incarceration among a group of individuals for whom incarceration might or might not be an appropriate use of state controls. In that light, our research strategy uses a propensity score method (described later) that compares inmates to similar individuals who did not receive prison sentences.

To summarize: The research proposed here is timely and important. It fills a significant gap in the literature on where ex-inmates live and on the possible implications of ex-inmates' residential location for neighborhood segregation (economic *and* racial). Filling that gap is important because of the consequences of residential segregation both for the individuals directly involved (the ex-inmates and their families) and for society in general. Implications of the expanding ex-inmate population for American society are magnified by the large difference in incarceration rates for blacks and others. African-Americans are both the most likely to be incarcerated and the most likely minority group to live in poor and racially homogeneous neighborhoods, yet to our knowledge this is the first systematic investigation of how incarceration might contribute to racial differences in residential mobility and segregation.

## DATA

This research proposes to investigate the effect of incarceration on residential segregation using data from the National Longitudinal Survey of Youth 1979 (NLSY79), the largest nationally representative data set that contains incarceration history. In conjunction with the Bureau of Labor Statistics, data collection began in 1979, when the respondents were between the ages of 14-22, and is ongoing as of 2006. Data were collected every year from 1979 to 1994, and biennially from 1994-2006, providing over 20 waves of data on a nationally representative sample of over 8500 Americans, including prisoners (the interviews were done in prison). These panel data include a wealth of social and economic indicators as well as over 25 years of incarceration data.

The 1979 start date is fortuitous for this study. From the 1930s to the early 1970s incarceration rates in the U.S. remained relatively steady at about 110 per 100,000 residents. By 2005 the rates had risen to 738 per 100,000 residents (Harrison & Beck 2006). By using NLSY79, then, we will be able to follow young adults as they age during the period of rapid expansion of the prison population. This is important because, as noted earlier, the expansion of the prison population over this period was largely due to a greater risk of incarceration for less serious offenders and longer sentences for other offenders, as opposed to a surge in crime. As a result, we can compare the effects of incarceration against a comparison group of convicted felons who are matched on a host or relevant social, demographic, and behavioral indicators.

For this project, the Bureau of Labor Statistics has given the Principal Investigators access to restricted data identifying the census tract location for all NLSY respondents at each wave of data collection. By merging information on residential location with the most recent wave of publicly available NLSY data, survey year 2006, the investigators have a data set that provides both sufficient statistical power and relevant geographic and demographic information to significantly advance knowledge on incarceration and residential location and segregation. The project focuses on blacks and whites because there are too few Latinos and Asian-Americans in the sample to permit separate analyses.

The research is organized around three hypotheses, as we now see.

## RESEARCH HYPOTHESES

The question we want to address in this research is whether, and to what extent, the prison boom in the U.S. has had the unintended consequence of exacerbating neighborhood inequality through its effects on the socioeconomic and racial makeup of neighborhoods. Importantly, our hypotheses carry implications both for individuals (does incarceration affect where an individual lives after release?) and for American society in general (has the rise in incarceration affected the socioeconomic and racial makeup of neighborhoods?).

Our first hypothesis pertains to the effect of incarceration on the socioeconomic makeup of neighborhoods:

**Hypothesis 1. Ex-inmates tend to live in more socioeconomically disadvantaged neighborhoods, other things equal**.

The underlying assumption of this hypothesis is that incarceration diminishes housing opportunities, beyond the negative effects of a felony conviction per se. In other words, if we compare an offender with a prison record to a convicted offender without a prison record, we expect the one with a prison record to live in a worse neighborhood socioeconomically, even if both individuals have similar social and demographic backgrounds and were convicted of similar felonies. .

There are three reasons to expect an incarceration effect. First, there is the stigmatizing effect of incarceration (Holzer, Raphael & Stoll 2006; Pager 2003). Landlords and employers alike may be especially wary of individuals with prison records. Second, incarceration removes an individual from the labor force, resulting in the interruption of work careers and very likely also in poorer jobs and lower income after release (see e.g. Western 2002; Pager 2003). Taking up residence in poor neighborhoods (even poorer than they came from) is the likely result for many ex-inmates because of their limited financial resources. Finally, there may be legal impediments. Many ex-inmates are not eligible for federal subsidy programs, including Section 8 housing programs. Because federal housing assistance programs often specifically target the disadvantaged (which would include most ex-inmates), such exclusions are likely to affect where ex-inmates live. According to the Bureau of Justice Statistics, about 5.6 million U.S. residents have served time in prisons (Bonczar & Beck 2003), almost all of whom have diminished economic opportunities. It is also plausible that, for many of these individuals, reduced opportunity for securing federally-supported housing further increases the likelihood that they will end up in poorer neighborhoods than they would have if they had not served time in prison.

In short, a good case can be made theoretically for the claim that incarceration contributes to the spatial concentration of poverty in the America. Ex-inmates are not randomly distributed across communities but are clustered in more disadvantaged neighborhoods. By "disadvantaged neighborhoods" we mean, first and foremost, neighborhoods characterized by low household incomes and high poverty rates. The spatial concentration of ex-inmates in such neighborhoods is consequential for the inmates and their families, since past research shows that living in poor neighborhoods can have adverse effects on one's life chances and on the life chances of one's children, for example higher crime and victimization rates (e,g, Sampson and Groves 1989), higher teenage pregnancy and school dropout rates [Harding 2003], lower levels of subjective well-being [Firebaugh & Schroeder 2009], and somewhat greater social isolation [Rankin & Quane 2000]). These costs are also borne by society at large, since high rates of crime, teenage pregnancy, and school underachievement affect us all.

Along with neighborhood poverty, neighborhood *racial segregation* can also be thought of as a type of disadvantage, particularly for blacks, since blacks in more segregated U.S. metropolitan areas have significantly worse outcomes (lower educational attainment, lower wages, higher unemployment, and greater prevalence of single mothers) than do blacks in less segregated metropolitan areas (Cutler & Glaeser 1997). That brings us to our second hypothesis:

**Hypothesis 2. Incarceration affects the racial composition of the neighborhood that ex-inmates select (or are selected into) after release from prison.**

The level of segregation of a metropolitan area is determined by differences in the level of racial homogeneity of its neighborhoods (Reardon & Firebaugh 2002). A racially segregated metropolitan area

is one where blacks largely live in predominately black neighborhoods, whites in predominately white neighborhoods, Latinos in predominately Latino neighborhoods, and so on. The racial homogeneity of neighborhoods in turn may be affected by incarceration – or so we hypothesize. If our hypothesis is correct, the return of black inmates to society might contribute to the spatial separation of races in American society.

The literature on racial segregation in America is extensive. Classic studies include Myrdal (1944), Taeuber & Taeuber (1965), and Wirth (1928). Acclaimed recent contributions include Cutler & Glaeser (1997), Iceland, Weinberg & Steinmetz (2002), and Massey & Denton (1993). For our purposes here, the important findings are these. First, although black-white segregation has declined in recent decades (Glaeser & Vigdor 2001; Iceland et al. 2002; Iceland 2009, chapter 3; Scopilliti & Iceland 2008), it remains at a very high level (e.g. Lee et al 2008). Second, racial residential segregation is consequential; as noted earlier, there is evidence linking racial residential segregation to a host of other racial disparities in America.

Third, racial residential segregation in America results, in large part, from the conjunction of two features of American society – racial inequality, and economic residential segregation. In other words, blacks on average are poorer than whites (racial inequality), and the poor tend to live among the poor while the rich tend to live among the rich (economic residential segregation: see e.g. Jargowsky 1997). That said, blacks and whites nonetheless are more residentially segregated than one would expect on the basis of racial inequality conjoined with economic segregation; there must be other causes as well (Massey & Eggers 1990; Massey & Denton 1993). Along that vein, Farley and Frey (1994; also Lee et al. 2008 and Reardon et al. 2009) offer a structural model of residential segregation that treats segregation of U.S. metropolitan areas as a function of their aggregate population characteristics, for instance population size, proportion black, black/white income ratio, and homeownership rates.

In addition to racial inequality, economic segregation, and the structural characteristics of metropolitan areas identified by Farley and Frey, it is possible that black-white residential segregation in America is also affected by the infusion of ex-inmates and their families. We explore that possibility with hypotheses 2a and 2b:

**Hypothesis 2a. For two *blacks* who are otherwise equal, one with a prison record will live in a more homogeneously black neighborhood.**

**Hypothesis 2b. For two *whites* who are otherwise equal, one with a prison record will live in a more *nonwhite* neighborhood.**

To test hypotheses 2a and 2b we will compare the residential location of ex-inmates before and after their prison spell, and also compare them with similar other convicted felons. Note that hypotheses 2a and 2b push in the opposite direction with regard to residential segregation, since hypothesis 2a implies an increase in segregation whereas hypothesis 2b implies a decline in segregation. It remains an open question, then, as to whether or not the effects of incarceration on the racial composition of neighborhoods operate to elevate black-white residential segregation. If hypotheses 2a and 2b are both correct, then the issue will turn on how large the effects are, and on the relative sizes of the black versus white ex-inmate populations. It is possible that the net effect of incarceration will vary across regions of the country, with incarceration having a segregation-boosting effect in the South, where the black population is largest, and no effect or the opposite effect in regions where blacks constitute a smaller fraction of the residential population. As explained subsequently, we will test for such regional differences.

Hypotheses 1 and 2 both bear on the important issue of whether, and to what extent, the U.S. correctional system serves as a stratifying institution (see e.g. Massoglia 2008; Pager 2003; Schnittker and John 2007; Western 2002, 2006). More specifically, as Raphael (2007, p. 1) puts it, "trends in incarceration rates are a likely source of increasing socioeconomic inequality along a number of dimensions." Our investigation extends prior research by focusing on how incarceration might contribute to the segregation of American neighborhoods along both socioeconomic (hypothesis 1) and racial (hypothesis 2) lines.

**Hypothesis 3 (intensification of effects over time). The effect of incarceration on neighborhood composition increases over the years after release from prison.**

We expect the effect of incarceration on residential location to intensify over time because of the institutional structure of the U.S. correctional system. The United States has a post-correctional (parole) system of supervision that offers or requires minimal residential and employment opportunities. Moreover, upon release from prison, some inmates return to short-term temporary housing (parents, close acquaintances). As time passes, the net provided by the correctional system is removed and ex-inmates are on their own to look for more permanent housing. It is at this point that ex-inmates are likely to find that their residential choices are increasingly constrained.

Perhaps as much as any, Hypothesis 3 is a working hypothesis, since past research tells us comparatively little about whether the effects of incarceration erode or intensify over time. In an ideal world, individuals could overcome the stigma and the human and social capital loss associated with a spell of incarceration. Scattered evidence on other outcomes suggests, however, that this is unlikely to be the case. Western's (2006) work on the labor market, for example, suggests that ex-inmates face wage penalties that widen over time. A contribution of this study is to see if similar processes work over time in the area of residential mobility. The release supports some inmates receive are temporary (e.g., placement in a halfway house), yet many of the economic and legal restrictions are permanent. As a result, the longer they are out of prison, the longer ex-inmates are on their own without a safety net. By determining whether the removal of the post-release safety net affects the residential location of ex-inmates, then, the proposed research fills a significant void in our understanding of the reach of incarceration over the life course.[2]

<u>**MEASURES**</u>

Research on where ex-inmates live is hindered by the scarcity of data with relevant measures. In 2008, the Principal Investigators wrote a proposal to the Bureau of Labor Statistics (BLS) to gain access to confidential zip code and census tract information for all 8500 NLSY respondents who remained in the sample from 1979 to 2006. After an extensive review for scientific merit, the BLS granted the request. Coupled with yearly data on incarceration status and other social and economic indicators, these data allow us to test the three hypotheses described above.

One way to conceptualize our analysis is to think of the incarcerated as the treatment group and similar others as the control group. With a sample of approximately 8500 we have plenty of cases for the control group; as with most work on incarceration, at issue is whether we have a sufficient sample of ex-inmates. A preliminary check indicates that our sample contains over 600 individuals who have been "treated" by

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[2] Our panel data permit us to follow some ex-inmates for up to 24 years after release, with a mean of approximately eight years. Americans move every five years, on average, and we expect much greater residential mobility for individuals just out of prison. If we assume that ex-inmates average three moves in eight years, then our data will include about 640x3 = 1920 residential relocations.

an incarceration spell at any point during the survey period.[3] Of these, we have post-release data for an average of eight years, so we have post-release data for approximately 4800 person-years for the treatment group. This, combined with data of almost 12,000 person-years for the control group (the size of the control group depends on the matching algorithm we use), provides sufficient statistical power to estimate the effects of incarceration on residential location, per our hypotheses. As a further testament to the adequacy of the data, it is noteworthy that a number of other investigations of the impact of incarceration have utilized the NLSY79 (Massoglia 2008; Pettit & Western 2004; Schnittker & John 2007; Sweeten & Apel 2007; Western 2002).

Our tests for the effects of incarceration on residential location depend on two comparisons: (1) for a given conviction level (e.g felony), those who have been incarcerated versus those who have not, and (2) of those who have been incarcerated, pre-incarceration versus post-incarceration. We will use propensity score methods and GIS mapping techniques to make those comparisons, as we describe later. Here we focus on describing the data that we will use in that analysis.

**Dependent Variable: Characteristics of Neighborhoods**

To determine the socioeconomic and racial makeup of the neighborhoods where ex-inmates live, we must first identify their neighborhoods from the NLSY data. Then we append data from the U.S. census on the racial and socioeconomic composition of the neighborhoods. We describe each step in turn.

Determining Respondent's Neighborhood

The NLSY records exact residential location for each respondent during each wave of data collection. The NLSY uses this information to produce a confidential, restricted access file that contains geographical data for all NLSY respondents. More specifically, this file contains residential Federal Information Processing (FIP) codes, county level data, zip code and census tract data for all respondents in the sample.

This geographical file is the most restrictive data housed by the NLSY. Access to this file requires an evaluation for scientific merit and a background check, and researchers must travel to the Bureau of Labor Statistics for on-site analysis. However, access to this geographical file is essential for our purposes because it allows us to situate individuals within a neighborhood whose key racial and socioeconomic composition can be obtained from census data (described below). Combined with the individual data in the public use file, the restricted residential NLSY file provides a golden (and, to our knowledge, untapped) opportunity to systematically investigate the relationship between incarceration and residential location.

Racial and Socioeconomic Characteristics of Neighborhoods.

The next step is to enter data from the U.S. Census on the racial and socioeconomic composition of neighborhoods. In line with most prior research on the socioeconomic and racial composition of neighborhoods (e.g. Jargowsky 1997; Logan et al. 2004; Wilkes & Iceland 2004), we use census tracts to define neighborhoods. Census tracts are constructed by local area committees with a view to partitioning the larger metropolitan area into neighborhood-like units of several thousand individuals. Importantly, the U.S. Census Bureau reports aggregated statistics on race and socioeconomic conditions by census tract. (Other options, such as the use of geographic areas defined by zip code, are less attractive because those areas are larger and more heterogeneous.)

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[3] This number is largely consistent with national rates on the prevalence of incarceration. The original NLSY79 sample started with approximately 12600 individuals, and almost 8500 remained through the most recent wave of data collection.

Because our analysis focuses on blacks and whites, racial composition will be measured as percent black and percent white by census tract (from Summary File 3 [SF-3] of the census). Our data for socioeconomic composition also come from the SF-3 census tables for census tracts. We will use nine indicators to test our hypothesis that, other things equal, ex-inmates tend to live in disadvantaged neighborhoods:

- Based on household income of neighborhood residents (4 measures): median income; poverty rate (% in poverty, % in extreme poverty, % households on public assistance)
- Based on education of neighborhood residents (2 measures): educational attainment for population age 25+ (16 categories); % 16-19 year-olds who are idle dropouts
- Based on quality and adequacy of housing (3 measures): year structure built (9 categories); % in overcrowded households; occupants per room (5 categories)

Operationally, then, the term "disadvantaged neighborhoods" as we use it refers to neighborhoods characterized by low median income, high poverty rates, low educational attainment, and substandard housing. We will examine each socioeconomic indicator separately before combining them to create a summary index of socioeconomic disadvantage. We will rely on data collected in the 1980 to 2010 decennial censuses and the American Community Surveys (ACS). For the non-census years 1979, 1981-1989, 1991-1999, and 2001-2004, we will need to interpolate neighborhood characteristics from the appropriate decennial censuses. Interpolation is not required after 2004 since the annual ACS provides geographically detailed information, such as data on income and educational attainment, that has traditionally been collected in the decennial census "long form." Some ACS data are available now, and complete ACS data are scheduled to be released later in 2010 (U.S. Census Bureau 2009).[4]

**Incarceration**

Incarceration is our focal independent variable. In the NLSY incarceration is a dichotomous variable (yes/no) indicating whether the respondent was incarcerated at the time of the survey. Because NLSY data are collected annually or biennially, "jail spells shorter than 12 months are underobserved … prison sentences (which typically exceed 12 months) are observed with certainty" (Western 2002:530). Others make the same point, noting that the NLSY is "more likely to capture spells lasting longer than a year" (Harper and McLanahan 2004:375). Our measure of incarceration, then, depicts substantial and invasive contact with the correctional system characteristic of more serious and chronic offenders as opposed to more passing contact with the correctional system (Massoglia 2008).

**Demographic and Lifestyle Variables**

Recall that we want to compare incarcerated individuals with similar other offenders who have not been incarcerated. The NLSY provides a rich source of data for demographic and lifestyle characteristics that enable us, in the language of propensity scores, to "balance" the treatment and control samples across these relevant indicators and, thus, to compare like with like (Firebaugh 2008, chapter 5).

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[4] The Census Bureau is producing three sets of publicly-available tabulations for geographic areas of 65,000 people or more: 1-year, 3-year, and 5-year estimates. For populations smaller than 20,000, only 5-year estimates will be provided. The first 5-year estimates will be for 2005-2009, and these are slated for release in 2010 (U.S. Census Bureau 2009, Table 3). That is why we say that "complete" ACS data will not be available until late 2010.

To balance the samples, we focus on three different phases of the life course – family background, individual characteristics and behavioral factors that affect risk of incarceration, and contemporaneous life style characteristics. The first is a series of variables that measures background characteristics, taken in survey years 1979-80. In addition to indicators of gender and race, this analysis considers measures of family welfare status, parents' education level, whether respondents lived with two parents, and control orientation. Other key individual-level indicators are, like the family background indicators, measured prior to incarceration. Measures of criminal behavior, including prior substance use and self-reported crime, are included to separate the effect of punishment from that of crime and are a proxy for risk-taking behavior (Gottfredson & Hirschi 1990). Thus, key control variables such as crime, psychological processes, social standing, and family structure are measured prior to risk of incarceration. Consistent with existing literature, the analysis also considers contemporaneous lifestyle indicators that tap into aspects of respondents' behavior and lifestyle choices. These lifestyle indicators include such things as cigarette use, binge drinking, illicit drug use, weight, exercise habits, and insurance status.

Contemporaneous life events are also included in the analysis. This block of factors includes whether respondents lived in an urban location, their poverty status and marital status, employment, educational attainment, and mental health.


## MODELS

**Models: A Brief Overview of Propensity Models**

Our hypotheses all deal directly with the impact of incarceration – our "treatment" variable – on residential outcomes. If incarceration occurred (or could be assigned) completely at random and the incarcerated and non-incarcerated samples were identical, estimating the causal impact of incarceration would be quite straightforward. Of course, incarceration does not occur at random and the incarcerated population differs from the non-incarcerated population in many important ways, including ways related to residential opportunities and choices.

For our purposes, then, the question becomes, what is the impact of incarceration on residential segregation and inequality among two individuals (or groups) who are identical on all the background and behavior factors related to incarceration, but where only one individual (or group) was actually incarcerated? In causal modeling language, the non-incarcerated group represents the counterfactual and provides the crucial comparison group to assess the impact of incarceration. As noted by others (Winship and Morgan 1999; Morgan 2001), it is not possible for individuals to be in both the treated and untreated state (both ever incarcerated and never incarcerated). As such, the problem can be conceptualized as one of missing data.

Propensity score methods attempt to address this problem by using relevant background and behavioral indicators to match individuals on the basis of their likelihood of experiencing a treatment – in this case incarceration. The treatment effect is then calculated by examining residential differences across individuals (or groups) who had the same likelihood of experiencing incarceration, but where only one actually experienced incarceration. Before presenting propensity matching procedures more formally, we summarize their underlying logic. First, if the matching equation adequately models the process that places individuals in the treatment group, then the analytic sample is homogeneous, save incarceration. And if the sample is homogenous (save incarceration) then incarceration can be treated as though it occurs at random (this is known as the ignorable treatment assumption or, in economics, the conditional independence assumption). For more detailed reviews of propensity models, see Dehejia & Wahba (2002), Rosenbaum & Rubin (1983), or Rubin & Thomas (1996).

**Estimating the Effect of Incarceration on the Socioeconomic (Hypothesis 1) and Racial (Hypothesis 2) Composition of Neighborhoods**

Estimation of propensity models involves two steps. The first step is to calculate the propensity score, that is, the risk of "treatment" (here, incarceration). Formally, the model can be expressed as:

$$p(incarceration) = \Pr(T_i=1 \mid X_i), \qquad\qquad (1)$$

where Pr denotes probability, $T_i=1$ if individual $i$ has ever been incarcerated and 0 otherwise, and $X_i$ is a vector of covariates for individual $i$ that predict incarceration or are potential confounding variables in the association between incarceration and residential segregation. The NLSY is a rich data set, and for our analysis the $X_i$ vector will include over two dozen background, lifestyle, and life course indicators. These indicators will include, for instance, family of origin factors such as parents' education level and whether the family received federal assistance, and respondent's level of education, employment status history, and marital status. Importantly, because we want to compare offenders who were incarcerated with those who were not, we will include measures of involvement with the correctional system, criminal behavior and substance use. Moreover, given the strong racial disproportionately in the risk of incarceration, we plan to include a number of race interactions, for instance black by drug use, black by violent crime, black by education level. Along similar lines, given the strong relationship between gender and incarceration, we will estimate similar models with gender interaction terms.

Note that every individual, regardless of incarceration status, is assigned a propensity score. A variety of different matching algorithms can be used to pair incarcerated individuals (the treated) with similar non-incarcerated individuals (the controls) on the basis of their likelihood to experience incarceration.

Once we have matched individuals on the basis of their propensity to be incarcerated, the next step is to determine if paired individuals across the matched samples – the ever-incarcerated sample and never-incarcerated sample – live in the same sorts of neighborhoods. Again, we hypothesize that they will not: Ex-inmates will tend to live in poorer and (at least for blacks) more racially homogeneous neighborhoods than do their matched counterparts who have not been incarcerated.

Let $Y_{1i}$ represent some neighborhood characteristic (e.g. poverty rate or racial homogeneity) for the place of residence of an individual $i$ who has been incarcerated and $Y_{0i}$ represent the same characteristic for an individual who has not been incarcerated. Then the treatment effect $\tau$ (i.e., the effect of incarceration) on type of neighborhood is simply the difference between $Y_{1i}$ and $Y_{0i}$ for matched individuals across the range of propensity scores, $p(inc_i)$, where the range of propensity scores spans the scores of ex-inmates $T_i = 1$ (Becker and Ichino 2002):

$$\tau = Y_{1i} - Y_{0i} \quad T_i=1, p(inc_i) \qquad\qquad (2)$$

In the case of hypothesis 1, for example, we expect $Y_{1i}$ and $Y_{0i}$ (values on neighborhood socioeconomic indicators among the treated and non-treated, respectively) to differ across the matched individuals (and thus the matched samples).

For hypothesis 2, we estimate separate $\tau$s for blacks ($\tau_b$) and whites ($\tau_w$) to test our expectation that incarceration boosts the racial homogeneity of neighborhoods for blacks but not for whites. In that case, $Y_{1i}$ refers to the racial composition of neighborhood (percent black for blacks and percent white for whites) for those who have been incarcerated, and $Y_{0i}$ refers to the racial composition of neighborhood for control individuals who have not been incarcerated. Given the racial disproportionately of incarceration

in the United States, we have approximately even racial distribution of the ex-inmates pool (334 blacks), providing sufficient statistical power for our race-specific analyses.

**Testing Hypothesis 3 (Intensification of Effects over Time)**

To test hypothesis 3 we can repeat our propensity score analysis, this time stratifying the sample by number of years since release. With over 25 years of data and several hundred inmates, the data have sufficient statistical power to support an analysis where we estimate the incarceration effect separately for the first three years after release, for years 4-6, and for years 7 and beyond. Stated more formally, we modify equation 2 by including a restriction for time since release (denoted *tr)*:

$$\tau_1 = Y_{1i} - Y_{0i} \quad T_i = 1, p(inc_i) \text{ if } tr \leq 3 \tag{3}$$

$$\tau_2 = Y_{1i} - Y_{0i} \quad T_i = 1, p(inc_i) \text{ if } tr > 3 \text{ but } \leq 6 \tag{4}$$

$$\tau_3 = Y_{1i} - Y_{0i} \quad T_i = 1, p(inc_i) \text{ if } tr > 6 \tag{5}$$

A number of straightforward statistical tests allow for a comparison of significant differences across the coefficients represented by $\tau_1, \tau_2$ and $\tau_3$ (e.g. Clogg, Petkova and Haritou 1995).

Finally, as a further test, we plan to utilize an additional sample restriction to provide an even more stringent test of the incarceration-segregation relationship. The core of the propensity model framework is the creation of a homogenous sample of treated (incarcerated) and control (non-incarcerated) individuals (equation [1] above). Among the vector of covariates used to model the probability of incarceration is a variable measuring involvement with the correctional system (specifically, conviction of a crime in an adult court). Whereas we previously used this measure to help estimate an individual's propensity to be incarcerated, we now re-run the propensity analysis outlined above while restricting the control group to those who were convicted of a felony, but not incarcerated. Thus, the treatment group will remain unchanged from earlier analysis, but the control group will consist only of individuals who were convicted of crimes. In all other respects, our matching procedure and analytic approach will remain unchanged. Preliminary analysis reveals that we have slightly fewer than 500 individuals who were convicted of a crime as adults, but never incarcerated. The most common correctional adjudication for such individuals would be some intermediate sanction such as probation. Thus, in the final aspect of our individual level analysis, we leverage two groups of individuals, both of whom carry the stigma associated with a criminal conviction, but where only one group of individuals was actually incarcerated. While we likely will have to use replacement sampling (where control individuals can be matched to multiple incarcerated individuals) and have less statistical power than earlier analysis, this sample restriction provides the most direct comparison of the two groups of interest: convicted offenders who did and who did not go to prison.

**Generalizing to the Population: How Much Does Incarceration Contribute to Racial Residential Segregation?**

Each year a population larger than the city of Boston is released from American prisons (almost 700,000 individuals). There are approximately 35,000 census tracts in the U.S., so *each year* the average census tract absorbs nearly 20 ex-inmates, not to mention their spouses and children. According to the Bureau of Justice Statistics, as of the early 2000s one in every 37 adults had served time in prison (Bonczar & Beck

2003). If one in every 37 adults is an ex-inmate, then today there are about 175 ex-inmates living in the average census tract of 6400 adults.[5]

Yet the estimate of 175 ex-inmates in the average census tract likely misrepresents the phenomenon if, as we hypothesize here, the distribution of ex-inmates is highly skewed toward disadvantaged neighborhoods. If our hypotheses are correct, the ex-inmate population is likely to constitute a significant fraction of the population in some poorer census tracts while constituting little or none of the population in more affluent tracts.  The social implications are potentially quite profound. But to tease out these implications, we must go beyond the propensity models used to test hypotheses 1 and 2. Although these models are powerful, they tell us only whether or not there are effects at the individual level.  The challenge, then, is to extrapolate the survey evidence to the general population so that we have credible estimates of how much, if at all, incarceration contributes to overall racial residential disparities in the United States.

Recall that $\tau_b$ tells us how much more (or less) racially homogenous the neighborhood of a formerly incarcerated black man is relative to a statistically identical black man who was never incarcerated (similarly for $\tau_w$, for whites).  If $\tau_b$ and $\tau_w$ are both zero, then we conclude that incarceration has no causal effect on the racial makeup of the neighborhoods where ex-inmates live, and we have an answer to the question of whether incarceration contributes to racial residential segregation in America: No, it does not.

On the other hand, if incarceration does have a causal effect on the racial makeup of neighborhoods (either $\tau_b$ or $\tau_w$ is nonzero, or both are nonzero), then incarceration *may* affect racial residential segregation.  As Iceland (2009, p. 144) explains, racial residential segregation generally refers to the distribution of racial groups across smaller areal units within some larger area. The smaller unit is usually the census tract, and the larger area most often is the metropolitan area.

Although NLSY79 is a relatively large sample, it does not contain enough cases to be broken down by metropolitan area, so we must use larger geographic units: the Northeast, Midwest, South, and West regions of the United States. Racial residential segregation for an areal unit can be thought of as the disproportionate distribution of races across that unit's neighborhoods. For example, if 80% of a region's residents are white and 20% are black, then segregation exists when the racial makeup of *any* of the census tracts deviates from the 80/20 ratio of whites to blacks. Segregation indexes are designed to measure the *average* deviation of neighborhoods from the racial composition of the overall region, normed from zero for no segregation to 1.0 for complete segregation (Reardon & Firebaugh 2002). Complete segregation occurs when all neighborhoods (usually measured as census tracts) are either 100% white or 100% black. There is no segregation at all (complete *integration*) when the racial makeup for each neighborhood is the same as the racial makeup for the region as a whole.

Incarceration increases racial residential segregation in a region when it results in the residence of black ex-inmates in "blacker" census tracts than the tracts where they would otherwise have resided, and similarly for white ex-inmates (residence in "whiter" census tracts than otherwise). By breaking our sample down into regions, the τs for blacks ($\tau_b$) and whites ($\tau_w$) will give us this information for the average black and average white ex-inmate in each of the four regions. In line with hypotheses 2a and 2b, we anticipate positive $\tau_b$s (indicating that black ex-inmates tend to take up residence in more homogeneously black neighborhoods) and negative $\tau_w$s (indicating that white ex-inmates tend to take up residence in less homogeneously white neighborhoods).

If our expectations are met, then the segregation-boosting effect of incarceration on blacks will be offset, wholly or in part, by the segregation-reducing effect of incarceration on whites. (Again, it is important to

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[5] The U.S. adult population today is approximately 225 million, or about 6400 adults per census tract.

emphasize that we do *not* expect such offsetting effects with respect to the effect of incarceration on the *socioeconomic* makeup of neighborhoods. In that case we expect, for both blacks and whites and their families, a reduction in the quality of neighborhoods where they reside after incarceration.) To determine whether the segregation-boosting effect dominates, we must weight the average effects for blacks and whites by the respective sizes of their ex-inmate populations. Because the relative sizes of those populations vary notably across the four regions we might find regional differences in the effect of incarceration on racial residential segregation even if the effects (the $\tau_b$s and the $\tau_w$s) are the same at the individual level.

Analytically, we will proceed as follows. First we separate the sample by race and calculate change in the racial makeup of the neighborhoods (change in percent black for blacks, change in percent white for whites) where ex-inmates lived before and after their prison spell. Then, using the matched sample from the propensity score analysis, we compare the change in neighborhood makeup for the incarcerated with the change in the neighborhood makeup over the same period of time for the matched sample of similar offenders who were not incarcerated. In other words, we compare the before-after neighborhood racial makeup for the treatment group of incarcerated offenders with the change in the neighborhood racial makeup for the control group of non-incarcerated offenders over the same period. We do this first for the entire sample, then separately for the Northeast, Midwest, South, and West. In the final step we weight the race-specific differences in the treatment and control groups by the relative populations of blacks and whites in the Northeast, Midwest, South, and West to determine whether, and to what extent, incarceration has affected racial residential segregation in each of these regions.

Finally, as a general check on whether the primary sampling units used in the NLSY are more or less representative with respect to the distribution of the ex-inmate population in the United States, we will compare the prevalence of ex-inmates in our sampled metros with the overall prevalence of ex-inmates in the U.S. population (from the Bureau of Justice Statistics and other sources). We may find that ex-inmates are overrepresented or underrepresented in the areas sampled by NLSY. If so, we will need to weight the $\tau_b$s and the $\tau_w$s accordingly before drawing inferences about the impact of incarceration on socioeconomic and racial residential segregation for United States *as a whole*. In any case, the estimates we will obtain are (to our knowledge) the first of their kind, and will serve as baseline estimates for subsequent analyses based on other data sets.

### TIMETABLE AND DISSEMINATION OF FINDINGS

- July – December, 2010. Determine census tract location of all NLSY respondents in each survey year. Merge this information with census data on racial and SES composition of census tracts. Much of this needs to be done on-site, involving multiple trips to the BLS in Washington, D.C.
- January – June, 2011. Test hypotheses 1 by estimating the causal effect of incarceration on the SES composition of ex-inmates' neighborhoods. Test hypothesis 3 by determining whether these effects intensify over time in the post-release period.
- July – December, 2011. Test hypothesis 2 as described above. Then we test hypothesis 3 by determining whether these effects intensify over time in the post-release period.
- January – June, 2012. Prepare research briefs of our findings. Present findings at conferences and prepare for publication in key journals in criminology, law, and sociology.

In addition to working together on data collection and analysis, Dr. Firebaugh and Dr. Massoglia will work collectively in the dissemination of the project's findings to the public and to public officials, as well as to other researchers in this field. This will involve the preparation of scholarly papers to be presented at academic conferences and submitted for publication in academic journals in criminology,

law, and sociology. Research briefs will target local and national news media so that our results are available to policy makers and to the general public.


**RESULTS OF PRIOR NSF SUPPORT**

1. "How much satisfaction does income buy?" Glenn Firebaugh, Principal Investigator (July 2006 – June 2008, SES #0549718).

Significant publications:
- Glenn Firebaugh and Laura Tach. "Income, age, and happiness in America." In Peter V. Marsden, ed., *Social Trends in the United States, 1972-2006: Evidence from the General Social Survey*. Princeton, NJ: Princeton University Press.
  * *Results featured in Los Angeles Times, New York Times, Philadelphia Inquirer*
- Glenn Firebaugh and Matthew Schroeder. 2009. "Does Your Neighbor's Income Affect Your Happiness?" *American Journal of Sociology* (in press, November).

This project examined a puzzle about the relationship between income and happiness. Although studies consistently find a positive cross-section association between income and happiness, Americans on average are no happier now than they were four decades ago, despite higher incomes for most. Apparently what matters is relative income, not absolute income. Findings on neighborhood effects suggest, however, that residing in a poorer neighborhood reduces, not enhances, one's happiness. Using survey data on happiness linked to neighborhood and county income data from the U.S. census, this project reconciles the relative income hypothesis with the neighborhood findings by testing income's effect at the individual, neighborhood, and county levels. Net of the effect of own income, it was found that Americans tend to be happier when they reside in *richer neighborhoods* (consistent with neighborhood studies) in *poorer counties* (as predicted by the relative income hypothesis). Thus it appears that individuals in fact are happier when they live among the poor, so long as the poor do not live too close.

The income-happiness project paves the way methodologically for the proposed project. Although they differ in substance, the two projects are similar analytically, since both link individual-level survey data to neighborhood data, and both require special access to geo-coded data to locate individuals in neighborhoods. The experience gained in the income-happiness project applies directly to the proposed project.

2. "Measuring Spatial Segregation." Sean Reardon and Stephen Matthews, Principal Investigators; Glenn Firebaugh, Barrett Lee, and David O'Sullivan, Investigators. Co-funded by the Sociology and the Methodology, Measurement, and Statistics Programs. (2005-2007, SES-0520400 and SES-0520405.)

Significant Publications:
- Sean F. Reardon, Chad R. Farrell, Stephen A. Matthews, David O'Sullivan, Kendra Bischoff, and Glenn Firebaugh. 2009. "Race and Space in the 1990s: Changes in the Geographic Scale of Racial Residential Segregation, 1990-2000." *Social Science Research* 38 (March): 55-70.
- Barrett Lee, Sean Reardon, Glenn Firebaugh, Chad R. Farrell, Stephen A. Matthews, David O'Sullivan. 2008. "Beyond the census tract: Patterns and determinants of racial segregation at multiple geographic scales." *American Sociological Review* 72 (October): 766-91.
- Sean F. Reardon, Stephen A. Matthews, David O'Sullivan, Barrett A. Lee, Glenn Firebaugh, Chad R. Farrell, and Kendra Bischoff. 2008. "The Geographic Scale of Metropolitan Racial Segregation." *Demography* 45:489-514 [lead article]

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This project is based on the earlier work of Reardon & Firebaugh (2002) and Reardon & O'Sullivan (2004) on developing more flexible methods for measuring segregation. The project had three aims: 1) To advance technical knowledge regarding the measurement of segregation; 2) to produce user-friendly software tools to enable other researchers to use the newly-developed methods for measuring segregation; and 3) to use the new methods to investigate patterns and trends in the socioeconomic and racial segregation of U.S. metropolitan areas.

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# BIOGRAPHICAL SKETCH
## Glenn Firebaugh, PhD

## Professional Preparation

Grace College, Social Studies, B.A., 1970
Indiana University, Bloomington, Sociology, M.A., 1974
Indiana University, Bloomington, Sociology, Ph.D., 1976

## Professional Employment

| | |
|---|---|
| 2006-present | Distinguished Professor of Sociology and Demography, The Pennsylvania State University |
| 2004-2006 | College of the Liberal Arts Research Professor, The Pennsylvania State University |
| 2004-2005 | Visiting Scholar, Harvard University |
| 2001-2004 | Department Head, Department of Sociology, The Pennsylvania State University |
| 1997-1999 | Editor, American Sociological Review |
| 1992-2001 | Faculty member, ISR Summer Institute, University of Michigan |
| 1992-present | Senior Scientist, Population Research Institute, The Pennsylvania State University |
| 1988-1992 | Professor of Sociology; Senior Scientist, Population Issues Research Center, Institute for Policy Research and Evaluation, The Pennsylvania State University |
| 1986-1988 | Director of Graduate Studies, Department of Sociology, Vanderbilt University |
| 1982-1988 | Associate Professor of Sociology, Vanderbilt University |
| 1976-1982 | Assistant Professor of Sociology, Vanderbilt University |

## Five Publications Related to Proposed Project

- Reardon, Sean F., and G. Firebaugh.  "Measures of Multigroup Segregation."  Pp. 33-67 in Ross Stolzenberg (ed.), Sociological Methodology 2002.  Boston and Oxford: Blackwell Publishing.
- Reardon, Sean F., and G. Firebaugh.  "Response: Segregation and Social Distance -- A Generalized Approach to Segregation Measurement." Pp. 85-101 in Ross Stolzenberg (editor), Sociological Methodology 2002.  Boston and Oxford: Blackwell Publishing.
- Lee,  Barrett A., Sean Reardon, Glenn Firebaugh, Chad R. Farrell, Stephen A. Matthews, David O'Sullivan. 2008. "Beyond the Census Tract: Patterns and Determinants of Racial Segregation at Multiple Geographic Scales." American Sociological Review 72 (October): 766-91.
- Reardon, Sean F., Stephen A. Matthews, David O'Sullivan, Barrett A. Lee, Glenn Firebaugh, Chad R. Farrell, and Kendra Bischoff.  2008.  "The Geographic Scale of Metropolitan Racial Segregation."  Demography 45:489-514. [lead article]
- Sean F. Reardon, Chad R. Farrell, Stephen A. Matthews, David O'Sullivan, Kendra Bischoff, and Glenn Firebaugh. 2009. "Race and Space in the 1990s: Changes in the Geographic Scale of Racial Residential Segregation, 1990-2000." Social Science Research 38 (March): 55-70.

## Five Other Significant Publications

- Firebaugh, G. 2008. *Seven Rules for Social Research*.  Princeton: Princeton University Press. 252 pages + index.

- Firebaugh, G.  2003.  *The New Geography of Global Income Inequality*. Cambridge and London: Harvard University Press.
- Firebaugh, G.  1997. *Analyzing Repeated Surveys*. Thousand Oaks, CA: Sage (Quantitative Applications in the Social Sciences series).
- Firebaugh, G. and Brian Goesling. 2004.  "Accounting for the Recent Decline in Global Income Inequality." American Journal of Sociology 110 (September): 283-312. [lead article]
- Firebaugh, G.  1999. "Empirics of World Income Inequality." American Journal of Sociology 104 (May):1597-1630. [lead article]

**Synergistic Activities**

Editor, American Sociological Review, 1997-1999
Elected Member, Sociological Research Association, 1995
Distinction in the Social Sciences Award, Pennsylvania State University, 2000
Taiwan National Science Council Distinguished Lecturer, Academia Sinica, Taipei, 2005
Fellow, Center for the Study of Poverty and Inequality, Stanford University, 2006 - present

**Co-Authors in the Last 48 Months**

Kendra Bischoff, graduate student, Stanford University
Cristina Bradatan, assistant professor, Texas Tech University
Shawn Dorius, graduate student, Penn State (journal revise & resubmit)
Chad Farrell, assistant professor, University of Alaska
Brian Goesling, researcher, Mathematica, Inc., Princeton, NJ
Barrett A. Lee, professor, Penn State
Stephen Matthews, associate professor, Penn State
Claudia Nau, graduate student, Penn State (conference presentation)
David O'Sullivan, professor, University of Auckland, New Zealand
Sean Reardon, associate professor, Stanford University
Matthew Schroeder, post-doctoral fellow, University of Minnesota (journal revise & resubmit)
Xiaozhou Wang, graduate student, Penn State (conference presentation)
Laura Tach, graduate student, Harvard University

**Student Theses Supervised (Chaired) in Last Five Years**

Paula Tufis (PhD, 2007), Principal Research Fellow, Research Institute for the Quality of Life, Romanian Academy of Science
Claudia Nau (MA, 2007), PhD student, Penn State
Matthew Schroeder (PhD, 2008), post-doctoral fellow, University of Minnesota
PhD dissertations in progress: Satvika Chalasani, Shawn Dorius, Xiaozhou Wang

<div align="center">

**BIOGRAPHICAL SKETCH**
**Michael Massoglia, PhD**

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**Professional Preparation**

University of Minnesota, Twin Cities, Sociology, B.A., 1998
Washington State University, Criminology, M.A., 1999
University of Minnesota, Twin Cities, Sociology, Ph.D., 2006

**Professional Employment**

2006- Present   -Assistant Professor of Sociology and Crime, Law & Justice. The Pennsylvania State
University
-Research Associate: Population Research Institute. The Pennsylvania State University
-Faculty Associate: Center on Population Health and Aging. The Pennsylvania State
University

**Publications Related to Proposed Project**

- Massoglia Michael and Jason Schnittker. 2009. "No Real Release: The Health Effects of Incarceration." *Contexts*, 8:38-42.
- Massoglia Michael and Jason Schnittker . 2009. "Improving the Health of Current and Former Inmates: What Matters Most?" In Natasha A. Frost, Joshua D. Freilich, and Todd R. Clear (Eds.), *Contemporary Issues in Criminal Justice Policy: Policy Proposals from the American Society of Criminology Conference*. Belmont, CA: Cengage/Wadsworth.
- Massoglia, Michael. 2008. "Incarceration, Health, and Racial Disparities in Health." *Law Society Review,* 42:275-306.
- Massoglia, Michael. 2008. "Incarceration as Exposure:  The Prison, Infectious Disease and Other Stress-Related Illnesses." *The Journal of Health and Social Behavior,* 49:56-71.
- Massoglia, Michael (2006).  "The Mid-life Health Consequences of Incarceration." Doctoral Dissertation, University of Minnesota, Twin Cities.

**Other Significant Publications**

- Massoglia, Michael and Christopher Uggen. (Forthcoming). "Settling Down and Aging Out: Toward an Interactionist Theory of Desistance and the Transition to Adulthood." *American Journal of Sociology*.
- Hartmann, Douglas and Michael Massoglia. 2007. "High School Sports Participation and Deviant Behavior: Evidence of Enduring, Bifurcated Effects." *The Sociological Quarterly,* 48:485-505.
- King, Ryan, Michael Massoglia and Ross MacMillan. 2007.  "The Context of Marriage and Crime: Gender, the Propensity to Marry, and Offending in Early Adulthood." *Criminology,* 45:33-65.
- Massoglia, Michael. 2006. "Desistance or Displacement? The Changing Patterns of Criminal Offending from Adolescence to Adulthood." *The Journal of Quantitative Criminology,* 22:215-239.

- Uggen, Christopher and Michael Massoglia 2003. "Desistance from Crime as a Turning Point in the Life Course." Pages 311-29 in *Handbook of the Life Course*, edited by Jeylan T. Mortimer and Michael Shanahan. New York, NY: Kluwer/Academic Plenum Publishing.

**Synergistic Activities**

Research Associate: Population Research Institute. Pennsylvania State University
Seed Grant : The Contribution of Incarceration to Racial Differences in Mortality" supported by the Center on Population Health and Aging, Pennsylvania State University, (National Institute on Aging, Demography of Aging Center, P30-AG024395) and the College of the Liberal Arts ($32,000)

**Co-Authors in the Last 48 Months**

Scott Eliason, Associate Professor, University of Arizona
Douglas Hartmann, Associate Professor, University of Minnesota
Ryan King, Assistant Professor, State University of New York at Albany
Paul Pare, Assistant Professor, Western Ontario University
Jason Schnittker, Associate Professor, University of Pennsylvania
Sonja Siennick, Graduate Student, Penn State University
Christopher Uggen, Professor, University of Minnesota

# SUMMARY PROPOSAL BUDGET

YEAR 1

| ORGANIZATION | | | | PROPOSAL NO. | DURATION (months) | |
|---|---|---|---|---|---|---|
| **Pennsylvania State Univ University Park** | | | | | Proposed | Granted |
| PRINCIPAL INVESTIGATOR / PROJECT DIRECTOR | | | | AWARD NO. | | |
| **Glenn Firebaugh** | | | | | | |

| A. SENIOR PERSONNEL: PI/PD, Co-PI's, Faculty and Other Senior Associates (List each separately with title, A.7. show number in brackets) | NSF Funded Person-months | | | Funds Requested By proposer | Funds granted by NSF (if different) |
|---|---|---|---|---|---|
| | CAL | ACAD | SUMR | | |
| 1. Glenn Firebaugh - PI | 0.25 | 0.00 | 0.00 | | |
| 2. Michael Massoglia - Co-PI | 1.03 | 0.00 | 0.00 | | |
| 3. | | | | | |
| 4. | | | | | |
| 5. | | | | | |
| 6. ( 0 ) OTHERS (LIST INDIVIDUALLY ON BUDGET JUSTIFICATION PAGE) | 0.00 | 0.00 | 0.00 | | |
| 7. ( 2 ) TOTAL SENIOR PERSONNEL (1 - 6) | 1.28 | 0.00 | 0.00 | | |
| B. OTHER PERSONNEL (SHOW NUMBERS IN BRACKETS) | | | | | |
| 1. ( 0 ) POST DOCTORAL SCHOLARS | 0.00 | 0.00 | 0.00 | 0 | |
| 2. ( 1 ) OTHER PROFESSIONALS (TECHNICIAN, PROGRAMMER, ETC.) | 0.60 | 0.00 | 0.00 | 3,044 | |
| 3. ( 1 ) GRADUATE STUDENTS | | | | 20,874 | |
| 4. ( 0 ) UNDERGRADUATE STUDENTS | | | | 0 | |
| 5. ( 0 ) SECRETARIAL - CLERICAL (IF CHARGED DIRECTLY) | | | | 0 | |
| 6. ( 0 ) OTHER | | | | 0 | |
| TOTAL SALARIES AND WAGES (A + B) | | | | 36,418 | |
| C. FRINGE BENEFITS (IF CHARGED AS DIRECT COSTS) | | | | 7,493 | |
| TOTAL SALARIES, WAGES AND FRINGE BENEFITS (A + B + C) | | | | 43,911 | |
| D. EQUIPMENT (LIST ITEM AND DOLLAR AMOUNT FOR EACH ITEM EXCEEDING $5,000.) | | | | | |
| TOTAL EQUIPMENT | | | | 0 | |
| E. TRAVEL 1. DOMESTIC (INCL. CANADA, MEXICO AND U.S. POSSESSIONS) | | | | 4,068 | |
| 2. FOREIGN | | | | 0 | |
| F. PARTICIPANT SUPPORT COSTS | | | | | |
| 1. STIPENDS $ 0 | | | | | |
| 2. TRAVEL 0 | | | | | |
| 3. SUBSISTENCE 0 | | | | | |
| 4. OTHER 0 | | | | | |
| TOTAL NUMBER OF PARTICIPANTS ( 0 ) TOTAL PARTICIPANT COSTS | | | | 0 | |
| G. OTHER DIRECT COSTS | | | | | |
| 1. MATERIALS AND SUPPLIES | | | | 0 | |
| 2. PUBLICATION COSTS/DOCUMENTATION/DISSEMINATION | | | | 0 | |
| 3. CONSULTANT SERVICES | | | | 0 | |
| 4. COMPUTER SERVICES | | | | 0 | |
| 5. SUBAWARDS | | | | 0 | |
| 6. OTHER | | | | 3,242 | |
| TOTAL OTHER DIRECT COSTS | | | | 3,242 | |
| H. TOTAL DIRECT COSTS (A THROUGH G) | | | | 51,221 | |
| I. INDIRECT COSTS (F&A)(SPECIFY RATE AND BASE) | | | | | |
| MTDC (Rate: 47.4000, Base: 47983) | | | | | |
| TOTAL INDIRECT COSTS (F&A) | | | | 22,744 | |
| J. TOTAL DIRECT AND INDIRECT COSTS (H + I) | | | | 73,965 | |
| K. RESIDUAL FUNDS | | | | 0 | |
| L. AMOUNT OF THIS REQUEST (J) OR (J MINUS K) | | | | $ 73,965 | $ |
| M. COST SHARING PROPOSED LEVEL $ 0 | AGREED LEVEL IF DIFFERENT $ | | | | |

| PI/PD NAME | FOR NSF USE ONLY | | |
|---|---|---|---|
| **Glenn Firebaugh** | INDIRECT COST RATE VERIFICATION | | |
| ORG. REP. NAME* | Date Checked | Date Of Rate Sheet | Initials - ORG |
| **Sherry yocum** | | | |

1 *ELECTRONIC SIGNATURES REQUIRED FOR REVISED BUDGET

**Revised Proposal Budget Revision # 1 for 1023725 Submitted On Jul 12 2010  7:46AM Electronic Signature**

# SUMMARY PROPOSAL BUDGET     YEAR    2

| | FOR NSF USE ONLY | | |
|---|---|---|---|

| ORGANIZATION | PROPOSAL NO. | DURATION (months) | |
|---|---|---|---|
| Pennsylvania State Unlv University Park | | Proposed | Granted |
| PRINCIPAL INVESTIGATOR / PROJECT DIRECTOR | AWARD NO. | | |
| Glenn Firebaugh | | | |

| A. SENIOR PERSONNEL: PI/PD, Co-PI's, Faculty and Other Senior Associates (List each separately with title, A.7. show number in brackets) | NSF Funded Person-months | | | Funds Requested By proposer | Funds granted by NSF (if different) |
|---|---|---|---|---|---|
| | CAL | ACAD | SUMR | | |
| 1. Glenn Firebaugh - PI | 0.25 | 0.00 | 0.00 | | |
| 2. Michael Massoglia - Co-PI | 1.03 | 0.00 | 0.00 | | |
| 3. | | | | | |
| 4. | | | | | |
| 5. | | | | | |
| 6. ( 0 ) OTHERS (LIST INDIVIDUALLY ON BUDGET JUSTIFICATION PAGE) | 0.00 | 0.00 | 0.00 | | |
| 7. ( 2 ) TOTAL SENIOR PERSONNEL (1 - 6) | 1.28 | 0.00 | 0.00 | | |
| B. OTHER PERSONNEL (SHOW NUMBERS IN BRACKETS) | | | | | |
| 1. ( 0 ) POST DOCTORAL SCHOLARS | 0.00 | 0.00 | 0.00 | 0 | |
| 2. ( 1 ) OTHER PROFESSIONALS (TECHNICIAN, PROGRAMMER, ETC.) | 0.60 | 0.00 | 0.00 | 3,138 | |
| 3. ( 1 ) GRADUATE STUDENTS | | | | 0 | |
| 4. ( 0 ) UNDERGRADUATE STUDENTS | | | | 0 | |
| 5. ( 0 ) SECRETARIAL - CLERICAL (IF CHARGED DIRECTLY) | | | | 0 | |
| 6. ( 0 ) OTHER | | | | 0 | |
| TOTAL SALARIES AND WAGES (A + B) | | | | 15,638 | |
| C. FRINGE BENEFITS (IF CHARGED AS DIRECT COSTS) | | | | 4,739 | |
| TOTAL SALARIES, WAGES AND FRINGE BENEFITS (A + B + C) | | | | 20,377 | |
| D. EQUIPMENT (LIST ITEM AND DOLLAR AMOUNT FOR EACH ITEM EXCEEDING $5,000.) | | | | | |
| TOTAL EQUIPMENT | | | | 0 | |
| E. TRAVEL     1. DOMESTIC (INCL. CANADA, MEXICO AND U.S. POSSESSIONS) | | | | 4,070 | |
| 2. FOREIGN | | | | 0 | |
| F. PARTICIPANT SUPPORT COSTS | | | | | |
| 1. STIPENDS     $——————— 0 | | | | | |
| 2. TRAVEL     ——————— 0 | | | | | |
| 3. SUBSISTENCE ——————— 0 | | | | | |
| 4. OTHER     ——————— 0 | | | | | |
| TOTAL NUMBER OF PARTICIPANTS     ( 0 )     TOTAL PARTICIPANT COSTS | | | | 0 | |
| G. OTHER DIRECT COSTS | | | | | |
| 1. MATERIALS AND SUPPLIES | | | | 0 | |
| 2. PUBLICATION COSTS/DOCUMENTATION/DISSEMINATION | | | | 0 | |
| 3. CONSULTANT SERVICES | | | | 0 | |
| 4. COMPUTER SERVICES | | | | 0 | |
| 5. SUBAWARDS | | | | 0 | |
| 6. OTHER | | | | 0 | |
| TOTAL OTHER DIRECT COSTS | | | | 0 | |
| H. TOTAL DIRECT COSTS (A THROUGH G) | | | | 24,447 | |
| I. INDIRECT COSTS (F&A)(SPECIFY RATE AND BASE) | | | | | |
| MTDC (Rate: 47.4000, Base: 24447) | | | | | |
| TOTAL INDIRECT COSTS (F&A) | | | | 11,588 | |
| J. TOTAL DIRECT AND INDIRECT COSTS (H + I) | | | | 36,035 | |
| K. RESIDUAL FUNDS | | | | 0 | |
| L. AMOUNT OF THIS REQUEST (J) OR (J MINUS K) | | | | $    36,035 | $ |
| M. COST SHARING PROPOSED LEVEL $     0     AGREED LEVEL IF DIFFERENT $ | | | | | |

| PI/PD NAME | FOR NSF USE ONLY | | |
|---|---|---|---|
| Glenn Firebaugh | INDIRECT COST RATE VERIFICATION | | |
| ORG. REP. NAME* | Date Checked | Date Of Rate Sheet | Initials - ORG |
| Sherry yocum | | | |

2 *ELECTRONIC SIGNATURES REQUIRED FOR REVISED BUDGET

# SUMMARY
# PROPOSAL BUDGET

Cumulative

| | | | | FOR NSF USE ONLY | | |
|---|---|---|---|---|---|---|

| ORGANIZATION | | | | PROPOSAL NO. | DURATION (months) | |
|---|---|---|---|---|---|---|
| **Pennsylvania State Univ University Park** | | | | | Proposed | Granted |
| PRINCIPAL INVESTIGATOR / PROJECT DIRECTOR | | | | AWARD NO. | | |
| **Glenn Firebaugh** | | | | | | |

| A. SENIOR PERSONNEL: PI/PD, Co-PI's, Faculty and Other Senior Associates (List each separately with title, A.7. show number in brackets) | NSF Funded Person-months | | | Funds Requested By proposer | Funds granted by NSF (if different) |
|---|---|---|---|---|---|
| | CAL | ACAD | SUMR | | |
| 1. **Glenn Firebaugh - PI** | 0.50 | 0.00 | 0.00 | | |
| 2. **Michael Massoglia - Co-PI** | 2.06 | 0.00 | 0.00 | | |
| 3. | | | | | |
| 4. | | | | | |
| 5. | | | | | |
| 6. ( ) OTHERS (LIST INDIVIDUALLY ON BUDGET JUSTIFICATION PAGE) | 0.00 | 0.00 | 0.00 | | |
| 7. ( 2 ) TOTAL SENIOR PERSONNEL (1 - 6) | 2.56 | 0.00 | 0.00 | | |
| B. OTHER PERSONNEL (SHOW NUMBERS IN BRACKETS) | | | | | |
| 1. ( 0 ) POST DOCTORAL SCHOLARS | 0.00 | 0.00 | 0.00 | 0 | |
| 2. ( 2 ) OTHER PROFESSIONALS (TECHNICIAN, PROGRAMMER, ETC.) | 1.20 | 0.00 | 0.00 | 6,182 | |
| 3. ( 2 ) GRADUATE STUDENTS | | | | 20,874 | |
| 4. ( 0 ) UNDERGRADUATE STUDENTS | | | | 0 | |
| 5. ( 0 ) SECRETARIAL - CLERICAL (IF CHARGED DIRECTLY) | | | | 0 | |
| 6. ( 0 ) OTHER | | | | 0 | |
| TOTAL SALARIES AND WAGES (A + B) | | | | 52,056 | |
| C. FRINGE BENEFITS (IF CHARGED AS DIRECT COSTS) | | | | 12,232 | |
| TOTAL SALARIES, WAGES AND FRINGE BENEFITS (A + B + C) | | | | 64,288 | |
| D. EQUIPMENT (LIST ITEM AND DOLLAR AMOUNT FOR EACH ITEM EXCEEDING $5,000.) | | | | | |
| TOTAL EQUIPMENT | | | | 0 | |
| E. TRAVEL 1. DOMESTIC (INCL. CANADA, MEXICO AND U.S. POSSESSIONS) | | | | 8,138 | |
| 2. FOREIGN | | | | 0 | |
| F. PARTICIPANT SUPPORT COSTS | | | | | |
| 1. STIPENDS $ 0 | | | | | |
| 2. TRAVEL 0 | | | | | |
| 3. SUBSISTENCE 0 | | | | | |
| 4. OTHER 0 | | | | | |
| TOTAL NUMBER OF PARTICIPANTS ( 0 ) TOTAL PARTICIPANT COSTS | | | | 0 | |
| G. OTHER DIRECT COSTS | | | | | |
| 1. MATERIALS AND SUPPLIES | | | | 0 | |
| 2. PUBLICATION COSTS/DOCUMENTATION/DISSEMINATION | | | | 0 | |
| 3. CONSULTANT SERVICES | | | | 0 | |
| 4. COMPUTER SERVICES | | | | 0 | |
| 5. SUBAWARDS | | | | 0 | |
| 6. OTHER | | | | 3,242 | |
| TOTAL OTHER DIRECT COSTS | | | | 3,242 | |
| H. TOTAL DIRECT COSTS (A THROUGH G) | | | | 75,668 | |
| I. INDIRECT COSTS (F&A)(SPECIFY RATE AND BASE) | | | | | |
| TOTAL INDIRECT COSTS (F&A) | | | | 34,332 | |
| J. TOTAL DIRECT AND INDIRECT COSTS (H + I) | | | | 110,000 | |
| K. RESIDUAL FUNDS | | | | 0 | |
| L. AMOUNT OF THIS REQUEST (J) OR (J MINUS K) | | | | $ 110,000 | $ |
| M. COST SHARING PROPOSED LEVEL $ 0 AGREED LEVEL IF DIFFERENT $ | | | | | |

| PI/PD NAME | | FOR NSF USE ONLY | | |
|---|---|---|---|---|
| **Glenn Firebaugh** | | INDIRECT COST RATE VERIFICATION | | |
| ORG. REP. NAME* | | Date Checked | Date Of Rate Sheet | Initials - ORG |
| **Sherry yocum** | | | | |

C *ELECTRONIC SIGNATURES REQUIRED FOR REVISED BUDGET

### Sr. Personnel

**Dr. Glenn Firebaugh, PI,** is budgeted for 1 month in each year of the project. Dr. Firebaugh will have overall responsibility for the project. This includes primary supervision of the graduate students, other grant personnel, budgetary considerations, and ensuring that the project makes progress consistent with the timeline outlined in the grant. In addition, Dr. Firebaugh will be primarily responsible for preparation of reports and manuscripts that develop from this project.

**Dr. Michael Massoglia, Co-PI**, is budgeted for 2 months in each year of the project. Dr. Massoglia will be primarily responsible for data analysis. In addition to overseeing work with the GIS core at Penn State University, Dr. Massoglia will make multiple trips to the Bureau of Labor Statistics for on-site analysis. These multiple site visits justify the additional month of salary for Dr. Massoglia. Finally, Dr. Massoglia will also assist Dr. Firebaugh in the supervision of graduate students and in the writing of manuscripts from the project.

### Other Personnel

Funds are requested to support programming and GIS services. The programmer will be responsible for generating the spatial maps that track inmate movement over time. Additionally, this GIA programmer will be responsible for incorporating other census tract characteristics – e.g., poverty, crime, unemployment – into the spatial maps to give a more complete accounting of the communities where inmates reside. The GIS programmer has access to and expertise with ARC mapping software.

Funds are also requested to support a graduate student for the first year (including summer months) and for the summer months of the second year. The graduate student will be responsible for creating files for GIS programmers to use. This involves collecting and pooling data on unemployment, crime, and poverty data for over 50,000 census tracts. Additionally, the graduate student will conduct literature reviews and assist the PIs with data analysis.

Salaries have been increased by 3% effective July 1.

### Recovery of Fringe Benefits

Rates have been approved by the Office of Naval Research, the cognizant federal agency for this institution. Rates for the period between July 1, 2009 and June 30, 2010 are 29.90 % applicable to Category I Salaries and 0.70 % applicable to Category IV Student Wages. The rates quoted above have also been used for any project period occurring after July 1, 2009 and forward in lieu of negotiated rates for the forward period.

### Travel

Funds are budgeted to travel to Washington DC to analyze the sensitive data. We request funds for 6 trips @ $700 per trip (3 days, 2 nights each).

### Other

Graduate Assistant Tuition - Computed using the approved dissertation tuition charges for a graduate assistant (of any grade and time level) of $1,515 for Fall Semester 2009, $1,515 for Spring Semester 2010, and $3,146 for Summer Session 2009. The charges quoted above are increased by seven (7.0%) percent for any project period occurring after Summer Session 2010, and each Summer Session thereafter.

**Recovery of Facilities and Administrative Costs**

Rates have been approved by the Office of Naval Research, the cognizant federal agency for this institution.  Rates for the period July 1, 2009 and June 30, 2010 are 48.0% (Research On-Campus) of Modified Total Direct Costs (MTDC).  The rates quoted above have also been used for any project period occurring after July 1, 2010 and forward in lieu of negotiated rates for the forward period.

# Current and Pending Support
**(See GPG Section II.C.2.h for guidance on information to include on this form.)**

The following information should be provided for each investigator and other senior personnel.  Failure to provide this information may delay consideration of this proposal.

| Investigator:  Glenn Firebaugh | Other agencies (including NSF) to which this proposal has been/will be submitted. |
|---|---|

Support:     ☐ Current    ☒ Pending    ☐ Submission Planned in Near Future    ☐ *Transfer of Support

Project/Proposal Title:    Ex-Inmates and Residential Segregation in America

Source of Support:      NSF
Total Award Amount: $     206,012 Total Award Period Covered:     07/01/10 - 06/30/12
Location of Project:      Penn State
Person-Months Per Year Committed to the Project.    Cal:1.00    Acad: 0.00    Sumr:  0.00

Support:     ☐ Current    ☐ Pending    ☐ Submission Planned in Near Future    ☐ *Transfer of Support

Project/Proposal Title:

Source of Support:
Total Award Amount: $        Total Award Period Covered:
Location of Project:
Person-Months Per Year Committed to the Project.    Cal:     Acad:     Sumr:

Support:     ☐ Current    ☐ Pending    ☐ Submission Planned in Near Future    ☐ *Transfer of Support

Project/Proposal Title:

Source of Support:
Total Award Amount: $        Total Award Period Covered:
Location of Project:
Person-Months Per Year Committed to the Project.    Cal:     Acad:     Sumr:

Support:     ☐ Current    ☐ Pending    ☐ Submission Planned in Near Future    ☐ *Transfer of Support

Project/Proposal Title:

Source of Support:
Total Award Amount: $        Total Award Period Covered:
Location of Project:
Person-Months Per Year Committed to the Project.    Cal:     Acad:     Sumr:

Support:     ☐ Current    ☐ Pending    ☐ Submission Planned in Near Future    ☐ *Transfer of Support

Project/Proposal Title:

Source of Support:
Total Award Amount: $        Total Award Period Covered:
Location of Project:
Person-Months Per Year Committed to the Project.    Cal:     Acad:     Summ:

*If this project has previously been funded by another agency, please list and furnish information for immediately preceding funding period.

# Current and Pending Support
**(See GPG Section II.C.2.h for guidance on information to include on this form.)**

The following information should be provided for each investigator and other senior personnel. Failure to provide this information may delay consideration of this proposal.

| Investigator: Michael Massoglia | Other agencies (including NSF) to which this proposal has been/will be submitted. |
|---|---|

Support: ☐ Current ☒ Pending ☐ Submission Planned in Near Future ☐ *Transfer of Support
Project/Proposal Title: Early Life Cognitive Resources and Later Life Health

Source of Support: NIH
Total Award Amount: $ 652,794 Total Award Period Covered: 07/01/10 - 06/30/12
Location of Project: Penn State
Person-Months Per Year Committed to the Project. Cal: 0.00 Acad: 4.50 Sumr: 2.00

Support: ☐ Current ☒ Pending ☐ Submission Planned in Near Future ☐ *Transfer of Support
Project/Proposal Title: Ex-Inmates and Residential Segregation in America

Source of Support: NSF
Total Award Amount: $ 206,012 Total Award Period Covered: 07/01/10 - 06/30/12
Location of Project: Penn State
Person-Months Per Year Committed to the Project. Cal: 2.00 Acad: 0.00 Sumr: 0.00

Support: ☐ Current ☐ Pending ☐ Submission Planned in Near Future ☐ *Transfer of Support
Project/Proposal Title:

Source of Support:
Total Award Amount: $ Total Award Period Covered:
Location of Project:
Person-Months Per Year Committed to the Project. Cal: Acad: Sumr:

Support: ☐ Current ☐ Pending ☐ Submission Planned in Near Future ☐ *Transfer of Support
Project/Proposal Title:

Source of Support:
Total Award Amount: $ Total Award Period Covered:
Location of Project:
Person-Months Per Year Committed to the Project. Cal: Acad: Sumr:

Support: ☐ Current ☐ Pending ☐ Submission Planned in Near Future ☐ *Transfer of Support
Project/Proposal Title:

Source of Support:
Total Award Amount: $ Total Award Period Covered:
Location of Project:
Person-Months Per Year Committed to the Project. Cal: Acad: Summ:

*If this project has previously been funded by another agency, please list and furnish information for immediately preceding funding period.

**Facilities, Equipment, and Other Resources**

In addition to being members of the Sociology faculty, Glenn Firebaugh and Michael Massoglia are affiliated with the Population Research Institute (PRI) at Penn State, where Firebaugh is a Senior Scientist and Massoglia is a Research Associate. These affiliations mean that both PIs have full access to all the services provided by PRI. Conveniently, the faculty offices for Firebaugh and Massoglia are in the same building as PRI.[1]

The proposed project will be administered through, and supported by, PRI. *The services that PRI will provide for this specific project will include, but are not limited to, the following areas*:

Administration

The PRI administrative core will handle all financial aspects of the grant. This will include the administration of multiple budget lines for the Principal Investigators, for the graduate research assistants, for computer programming, for travel expenses to the BLS data archives in Washington DC, and so on. The administrative core of PRI will also provide general office support and routine office supplies.

Information Core

PRI's information core will provide three important services for this project. First, they will oversee the the security of restricted data, a critical issue here. While most of the secure data are housed on site at the Bureau of Labor Statistics, some restricted geographic data will be analyzed at Penn State. The information core will manage the storage, access and security of restricted data. The data archivists in the information core have extensive experience in managing restricted data and have assisted (will continue to assist) the PIs in making the necessary arrangements for storing and accessing such data at Penn State.

Second, the information core will assist the PIs and the graduate assistants in library searches and literature reviews. PRI researchers have direct access to the Penn State University Libraries collection of more than 5million volumes and more than 400 online databases. Information core staff  perform literature searches upon request for PRI researchers.

Finally, the information core will work with Penn State's Department of Public Information to distribute press releases related to this proposal. A key part of this project involves the dissemination of results to public officials and to the general public; the information core will play an important role in that dissemination. The results of this research will also be highlighted on the PRI web site.

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[1] PRI is one of a group of Population Centers in the United States supported by the Eunice Kennedy Shriver National Institute of Child Health and Human Development (NICHD). These Centers represent the primary federal entity for supporting innovative research in the population sciences. For further information, see the PRI web site at http://www.pop.psu.edu.

Computer Core and GIA Services

The analytic part of this project will rely heavily on the expertise of Dan Meehan, manager of the Geographic Information Analysis (GIA) Core at the Population Research Institute at PRI.  Along with Dr. Massoglia, Meehan has already received security clearance from the Bureau of Labor Statistics (BLS) in Washington D.C. to analyze data that is kept on-site at BLS. Massoglia has already laid the groundwork in prior trips to the BLS Washington site, and he and Meehan are planning multiple future trips to Washington to complete the analysis.

Meehan will be involved in the data analysis both at Penn State and at the BLS data center in Washington. While all requisite software are currently available at Penn State, specialized software will need to be installed at the BLS site. There Meehan will install ESRI's ArcGIS desktop software on the local machine in order to map descriptive data over the census tracts where respondents live. This mapping will include data on levels of poverty and residential segregation for census tracts (we are particularly interested in the characteristics of the census tracts where incarcerated individuals reside after their release from prison).  Meehan will write the necessary programs to map publicly available data from the 1980, 1990, and 2000 US censuses to create contextual data sets that will allow us to assess whether, for instance, an ex-inmate lives in a poorer neighborhood upon release than he or she did prior to incarceration.