

Beyond Incarceration: Criminal Justice Contact and Mental Health

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Abstract

A growing literature documents deleterious consequences of incarceration for mental health. Although salient, incarceration is only one form of criminal justice contact and, accordingly, focusing on incarceration may mask the extent to which the criminal justice system influences mental health. Using insights from the stress process paradigm, along with nationally representative data from the National Longitudinal Survey of Youth 1997, we examine criminal justice contact—defined as arrest, conviction, and incarceration—and mental health. First, fixed-effects models, which adjust for stable unobserved and time-varying observed characteristics, show that arrest is deleteriously associated with mental health, and arrest accounts for nearly half of the association between incarceration and poor mental health, although certain types of incarceration appear more consequential than others. Second, the associations are similar across race and ethnicity; this, combined with racial/ethnic disparities in contact, indicates that criminal justice interactions exacerbate minority health inequalities. Third, the associations between criminal justice contact, especially arrest and incarceration, and mental health are particularly large among respondents residing in contextually disadvantaged areas during adolescence. Taken together, the results suggest that the consequences of criminal justice contact for mental health have a far greater reach than previously considered.

Keywords

criminal justice, mental health, stress process, inequality

It is now undisputed that the United States has experienced a dramatic growth and recent stabilization in incarceration rates (Travis, Western, and Redburn 2014; Wakefield and Uggen 2010). In response to the sheer numbers of individuals who spend time behind bars, research documents the mostly deleterious consequences of incarceration for health (for reviews, see Massoglia and Pridemore 2015; Wildeman and Muller 2012). Indeed, although current incarceration is associated with some physical health benefits (Spaulding et al. 2011; see also Baćak and Wildeman 2015), individuals with an incarceration

history, compared to their counterparts, have higher mortality (Binswanger et al. 2007; Patterson 2010), greater stress-related and infectious diseases (Massoglia 2008a), severe health impairments (Schnittker and John 2007), and worse mental health (Schnittker, Massoglia, and Uggen 2012; Turney, Wildeman, and Schnittker 2012).

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As consequential as incarceration is for mental health, it excludes other criminal justice contact, such as police stops, arrests, and convictions, as well as supervision by probation or parole (Lerman and Weaver 2014). Although the prevalence of incarceration in jails and prisons is high in the United States—nearly five times the rate of 40 years ago and higher than any other developed country—it is dwarfed by the frequency of arrests and convictions (Glaze and Herberman 2013; U.S. Department of Justice 2013). The expansive scope of the criminal justice system extends beyond the currently and formerly incarcerated (Brayne 2014; Lerman and Weaver 2014; Uggen et al. 2014); accordingly, focusing on only incarceration likely underestimates the ramifications of the criminal justice system for mental health (Geller et al. 2014; Sewell and Jefferson 2016; Sewell, Jefferson, and Lee 2016).

Theoretically, the stress process paradigm suggests that criminal justice contact increases mental health problems. The paradigm proposes that disadvantaged social contexts and status positions, such as racial/ethnic minority status, differentially expose individuals to social stressors (Pearlin 1989; Pearlin et al. 1981; Thoits 2010). Stressors proliferate throughout the life course, and a primary stressor such as criminal justice contact can lead to secondary stressors, or reverberating chronic strains, in other domains of life (e.g., employment or relationships). It is this combination of primary and secondary stressors that harms mental health. Furthermore, the stress process paradigm suggests that the ecological context, as part of the “stress universe” experienced by individuals, may shape responses to stressors (Aneshensel 2009; Wheaton 1994).

Grounded in the stress process paradigm, we suggest that three forms of criminal justice contact¹—arrest, conviction, and incarceration, all concentrated among individuals in disadvantaged status positions—are salient stressors that impair mental health. The findings, which are based on nationally representative data from the National Longitudinal Survey of Youth 1997 (NLSY97) and fixed-effects models that adjust for time-stable

unobserved and time-varying observed characteristics of individuals, forward scholarship on criminal justice, health, and inequality in three ways. First, we document that changes in arrests and incarcerations, but not convictions, are independently associated with changes in mental health problems. Arrest drives nearly half the association between incarceration and mental health, although some types of incarceration (including current incarceration, first-time incarceration, and pretrial incarceration) may be more salient than others. Second, we find that these associations are similar across race/ethnicity. Third, we find that the relationship between criminal justice contact, especially arrest and incarceration, and mental health is especially consequential among individuals residing in disadvantaged ecological contexts during adolescence. We demonstrate that focusing on the health consequences of incarceration only, as is common (although for research on police stops, see Geller et al. 2014; Sewell et al. 2016), fails to capture the scope of the criminal justice system and its role in perpetuating inequality.

TYPES OF CRIMINAL JUSTICE CONTACT

Criminal justice contact includes many forms of interaction with criminal justice agencies, including but not limited to incarceration in jails and prisons. Although a large literature considers the health consequences of incarceration, it is not the most frequent type of contact, nor is it necessarily the most consequential or long-lasting form of interaction.²

It is well known that the U.S. incarceration rate increased dramatically over the past four decades, with 2.2 million individuals currently incarcerated in jails and prisons (Glaze and Kaeble 2014). Population-level statistics regarding arrest and conviction have received less scholarly attention. Recent estimates suggest that 12.2 million individuals are arrested annually (U.S. Department of Justice 2013). By age 23, between 30 and 41 percent of individuals have been arrested, many of whom are never convicted of a crime (Brame et al.

2012). Although many arrests do not result in conviction, the prevalence of conviction among young people is also quite common. Among individuals between the ages of 24 and 32, 14 percent report a conviction (Lerman and Weaver 2014). Therefore, not considering arrest and conviction alongside incarceration underestimates the prevalence of criminal justice contact and its consequences.

THE STRESS PROCESS PARADIGM: LINKING CRIMINAL JUSTICE CONTACT AND MENTAL HEALTH

The stress process paradigm, often used to explain how life events and chronic strains create and exacerbate social inequalities in health, is a theoretical framework for understanding the relationship between criminal justice contact and mental health (Pearlin 1989; Pearlin et al. 1981; Thoits 2010). Three aspects of this paradigm are especially relevant: (1) the socially patterned nature of stressors; (2) the way that initial, or primary, stressors proliferate to produce secondary stressors, both of which contribute to health inequalities; and (3) how the ecological context, as part of the stress universe, can condition responses to stressors.

Social Patterning of Criminal Justice Contact

First, the stress process paradigm posits that exposure to stressors, such as criminal justice contact, is socially patterned. Stressors are concentrated among individuals in disadvantaged social statuses, such as racial/ethnic minorities (Pearlin 1989). For example, the cumulative prevalence of arrest varies across race and ethnicity, with 38 percent of non-Hispanic white males and 49 percent of non-Hispanic black males arrested by age 23 (Brame et al. 2014). Among individuals age 24 to 32, 26 percent of young black men have been convicted of a crime (compared to 14 percent among young adults more generally;

Lerman and Weaver 2014). And incarceration, which is commonly conceptualized as a stressor (Massoglia and Pridemore 2015; Turney 2014; Turney et al. 2012), is concentrated among racial/ethnic minorities. About 3 percent of white men spend time in prison by their mid-30s, compared to 20 percent of black men (Pettit and Western 2004).

Stress Proliferation and Criminal Justice Contact

The stress process paradigm highlights the complexity and multiplication of stressors (Pearlin, Aneshensel, and Leblanc 1997). Primary stressors can give rise to secondary stressors, or chronic strains, which together have deleterious consequences for mental health. For example, police stops have been conceptualized as stressors that exacerbate poor health, through both initial stressors of trauma and physical strain (Geller et al. 2014; Sewell and Jefferson 2016; Sewell et al. 2016) and additional stressors such as limited access to medical facilities (Brayne 2014). We propose that arrest, conviction, and incarceration are primary stressors that proliferate to secondary stressors, both of which impair mental health.

Arrest as a stressor. Theoretically, being arrested may be a stressor that both directly and indirectly influences mental health. First, the stigma of arrest may be a primary stressor (Lerman and Weaver 2014; Williams and Hawkins 1986), which may directly increase mental health problems (Hatzenbuehler, Phelan, and Link 2013; Link and Phelan 2006). Second, being arrested involves police contact. This can involve searches of one's person and property, physical contact, and disparaging remarks, all of which may be traumatic events (Brunson and Weitzer 2009). In-depth interviews suggest that the experience of arrest (without other forms of criminal justice contact) is linked to feelings of powerlessness and alienation (Lerman and Weaver 2014). Third, being arrested often involves court appearances and other bureaucratic procedural requirements, such as making arrangements at

work, for childcare, and for other obligations (Kohler-Hausmann 2013). Fourth, arrest can entail anticipatory stressors related to uncertainty about the future (Pearlin and Bierman 2013). Arrested individuals do not know if they will stand trial, be convicted of a crime, or spend time in jail or prison and, if so, the length of their confinement and their ability to communicate with loved ones (Kohler-Hausmann 2013). All these stressors of arrest—the corresponding stigma, police contact, bureaucratic hassles, and uncertainty—may directly increase mental health problems.

The primary stressors of arrest may also lead to secondary stressors that have consequences for mental health. For example, the growing proliferation of digital records, such as online mugshots, has broadened public access to arrest information. Through these websites, arrests have become salient signals of criminality that may have detrimental consequences for employment, school, housing, and family relationships (Lageson 2016). Relatedly, a recent experimental audit study found that individuals who report a disorderly conduct arrest on a job application receive fewer callbacks than do their counterparts, suggesting that employers perceive arrests as stigmatized credentials (Uggen et al. 2014; see also Wiesner, Kim, and Capaldi 2010); in turn, unemployment may impair mental health (Frech and Damaske 2012).

Conviction as a stressor. There are also good reasons to expect that a conviction is a primary stressor that leads to secondary stressors, both of which impair mental health. Similar to an arrest, conviction involves stigma, contact with the police, and bureaucratic necessities, all of which may negatively impair mental health.

In other ways, conviction—which may or may not involve incarceration—may be a uniquely consequential experience. For starters, a conviction—unlike an arrest—is a formal punishment that explicitly conveys guilt and criminality. The emergent stressors of conviction include legal consequences, which facilitate exclusion from an array of governmental services, leading to what some scholars

call a “civil death” (Chin 2012; Lerman and Weaver 2014). These consequences of conviction preclude forms of civic engagement such as voting (Lerman and Weaver 2014; Manza and Uggen 2006), which may increase feelings of powerless and anomie and, therefore, damage mental health. Other sanctions include loss of public benefits eligibility for drug-related felony convictions (Rubinstein and Mukamal 2001), disqualification from student loans (Mauer and Chesney-Lind 2002), and restricted access to licenses to work in certain professions and occupations (Stafford 2006). These exclusions may exacerbate financial stress and, in turn, worsen mental health. The formal punishment of conviction is also accompanied by stigma that can facilitate additional stressors. Experimental audit studies suggest that the stigma of a felony conviction on job applications is associated with a decreased likelihood of receiving a callback (Pager 2003; Pager, Western, and Bonikowski 2009). Finally, because many convicted offenders are placed on probation, they may experience extended contact with the criminal justice system (e.g., visits from officers, employment screens, drug tests) that leads to avoidance of surveilling institutions such as banks and hospitals (Brayne 2014; Goffman 2009), which may impair mental health.

Incarceration as a stressor. As prior work suggests (Massoglia 2008a; Turney et al. 2012), incarceration is a stressor with deleterious mental health consequences. Incarcerated individuals are most often arrested and sometimes convicted and, therefore, experience the stressors associated with these forms of criminal justice contact. But they also endure stressors unique to incarceration that can impair mental health. The conditions of incarceration or the “pains of imprisonment”—the isolation, confinement, regimentation, and danger of the prison environment—can increase stress (Sykes [1958] 2007).

Additionally, secondary stressors may arise during the transition from incarceration back to the community. Recent qualitative research documents anxiety about social interactions and feelings of isolation after

release from prison, both of which occur under conditions of severe material hardship (Western et al. 2015). Indeed, quantitative research finds that an incarceration history is associated with a greater likelihood of mood disorders such as major depressive disorder, bipolar disorder, and dysthymia (Schnittker et al. 2012; Turney et al. 2012). These prior estimates of incarceration and mental health may be overestimated, however, as they compare incarcerated individuals to those not incarcerated and do not take into account arrest and conviction.

Incarceration may also have offsetting consequences for mental health. Incarcerated individuals have more access to health care and medication (although this varies across localities and states) (Wilper et al. 2009; see also Patterson 2010). Incarcerated individuals also report strong romantic relationships during their confinement (Comfort 2008; Turney 2015) and optimistic expectations for their lives after release (Manza and Uggen 2006). Reentry back to the community can be a complex emotional period, as the stress of reintegration is mixed with happiness from reuniting with friends and family and hopefulness for new opportunities (Nelson, Deess, and Allen 1999; Western et al. 2015). Incarceration may thus have offsetting influences on mental health, and these offsetting influences may dampen the otherwise entirely deleterious stressors of incarceration.

Variation by race/ethnicity. According to the stress process paradigm, individuals vary in their exposure and responses to stressors, and the association between criminal justice contact and mental health might vary by race/ethnicity. Arrest, conviction, and incarceration are concentrated among lower-status groups such as racial/ethnic minorities. Racial/ethnic minorities experience more social and economic disadvantages than do their counterparts, and this accumulation of disadvantages, in combination with the primary stressors of criminal justice contact, may be especially consequential for mental health (DiPrete and Eirich 2006; Pearlin

1989). Moreover, the stigma of criminal justice contact among racial/ethnic minorities may also compound secondary stressors (Hatzenbuehler et al. 2013; Pager 2003). Finally, criminal justice contact may be more consequential for the mental health of racial/ethnic minorities due to perceptions of the system as a racialized institution in the United States (Peffley and Hurwitz 2010). The link between perceived racial discrimination and mental health symptoms is well documented in the stress literature (Williams and Mohammed 2009), and the stressor of criminal justice contact may be exacerbated among racial/ethnic minorities by uncertainties about racial profiling and fairness.

Alternatively, criminal justice contact may be a universal stressor for all racial/ethnic groups. The concept of disadvantage saturation, where adverse experiences become less consequential after reaching a certain threshold (Hannon 2003; Krivo and Peterson 2000; McNulty 2001), provides some guidance. Racial/ethnic minorities may experience negative and compounding stressors prior to criminal justice contact, leading to deleterious consequences for mental health that are not any more severe than those experienced by non-Hispanic white individuals. Indeed, research on incarceration and health has found similar associations across race/ethnicity (Massoglia 2008b; Schnittker and John 2007; Turney et al. 2012). Importantly, even if criminal justice contact is a universal stressor, the differential *exposure* to criminal justice contact across groups would increase racial/ethnic inequalities in health (Thoits 2010).

Considering the Ecological Context

Strains are also the result of interaction between stressors and a person's ecological context, or "stress universe" (Aneshensel 2009; Avison 2010; Pearlin 1989; Wheaton 1994). The term stress universe refers to the varied contexts in which stressors can manifest, including the individual, meso, and macro levels (Wheaton 1994). The meso level, or the local contextual area, may

influence how individuals respond to the stressors of criminal justice contact. A person's stress universe is composed of interrelated spheres of present and past contexts, and prior circumstances condition an individual's later interpretation and response to stressors (Pearlin 1989, 1999). Growing up in a particularly advantaged or disadvantaged area is one type of ecological context that may condition an individual's experience of criminal justice contact. Understanding the role of ecological context for the mental health consequences of criminal justice contact is also an important consideration given the concentration of contact in highly disadvantaged areas (Sampson and Loeffler 2010).

On the one hand, the deleterious consequences of criminal justice contact may be more consequential for individuals previously exposed to highly disadvantaged contexts. People who grow up in areas with high poverty and unemployment rates experience more social and economic adversity than do their counterparts, and these experiences may leave them less able to cope with the stress of criminal justice contact. Individuals who previously resided in highly disadvantaged areas may have fewer individual resources and less access to social capital to buffer against stressors (Crowder and South 2003; Wilson 1996). This accumulation of disadvantages may compound the stress of criminal justice contact, and thus the consequences for mental health may be especially severe (DiPrete and Eirich 2006; Pearlin 1989).

On the other hand, the deleterious consequences of criminal justice contact may be more consequential for individuals previously exposed to *advantaged* areas. Many of the stressors for mental health, as described earlier, are contingent on stigma associated with criminal justice contact. Unlike people exposed to disadvantaged contexts, where the prevalence of criminal justice contact may be normalized (Western 2006), individuals who grew up in advantaged contexts might experience more stigma relative to their counterparts in disadvantaged areas. Relatedly, stressors are particularly consequential for mental

health when they are unanticipated (Eaton 1978; Wheaton 1982) or occur among individuals with better baseline mental health (Casciano and Massey 2012), both of which suggest a stronger relationship between criminal justice contact and poor mental health among individuals from advantaged contexts.

In this article, we consider county-level measures of ecological context. Counties are often large units, extending beyond one's sphere of neighbors and streets, but they are appropriate units for studying both criminal justice contact (Andersen 2015; Johnson 2006) and mental health (McLeod and Edwards 1995; Muramatsu 2003; Zimmerman and Bell 2006). The county-level context may condition stressors in three ways. First, the social meaning of stressors is shaped by contexts routinely navigated by individuals. Research finds that people often define their neighborhoods as extending beyond the boundaries of smaller units, like census tracts (Basta, Richmond, and Wiebe 2010), and people travel outside these boundaries to go to routine places, such as the grocery store, church, and work (Krivo et al. 2013). Second, the secondary stressors resulting from criminal justice contact, such as unemployment or family dynamics, are often shaped by county-level characteristics (Cherlin, Ribar, and Yasutake 2016; McClendon 2016; Seals 2009). Third, individuals may turn to social services, which are often determined at the county level, to cope with the mental health consequences of criminal justice contact (Diez Roux 2001).

NONRANDOM SELECTION INTO CRIMINAL JUSTICE CONTACT

Observed relationships between criminal justice contact and mental health may result not from criminal justice contact itself but from other unobserved factors associated with contact and mental health. Arrest, conviction, and incarceration are not randomly distributed across the population but are concentrated

among racial/ethnic minorities, the poor, and people with mental health problems (Prins 2014; Teplin 1984; Western 2006). To account for the potentially spurious relationship between criminal justice contact and mental health, we utilize longitudinal panel data with fixed-effects regression models. The fixed-effects models adjust for observed time-varying and *unobserved* time-invariant stable characteristics of individuals (e.g., personality traits, family background characteristics, and prior criminal justice activity) and, accordingly, strengthen causal inference (Allison 2009). Although these models do not directly account for reverse causality (i.e., that mental health problems lead to criminal justice contact), the timing of variable measurement (with criminal justice contact being measured in the past year and mental health being measured in the past month) strengthens our conclusions about the direction of the association.

DATA, MEASURES, AND ANALYTIC STRATEGY

Data

We examine associations between criminal justice contact and mental health using data from the National Longitudinal Survey of Youth 1997 (NLSY97). The NLSY97 is a panel dataset of 8,984 youth between the ages of 12 and 16 on December 31, 1996 (Moore et al. 2000). These data include a nationally representative sample of 6,748 youths born between January 1, 1980 and December 31, 1984 and an over-sample of 2,236 Hispanic and non-Hispanic black youth. Beginning in 1997, participants have been interviewed annually.

These data are well positioned to help us understand the relationship between criminal justice contact and health. First, the NLSY97 is one of the few nationally representative surveys using a contemporary cohort, capturing the expanded scope and prevalence of criminal justice contact. Second, the NLSY97 data include information about a range of criminal justice contact (including arrest,

conviction, and incarceration). Third, the NLSY97 collected information on criminal justice contact and mental health over time, facilitating the use of fixed-effects models that take into account within-person changes in criminal justice contact and mental health. Fourth, the data include county-level identifiers, making it possible to consider variation in this association by previous exposure to disadvantaged ecological contexts. Despite these strengths, the NLSY97 is limited because it does not include information about police stops.³

In this article, we use data from the six NLSY97 survey waves that included questions about mental health, which were administered every other year from 2000 through 2010. We further restrict the analyses to person-years in which respondents were at least 18 years old and the dependent variables are not missing. This leaves a final analysis sample of 42,478 person-years, corresponding to approximately 7,500 respondents interviewed in each survey wave (with the exception of the 2000 survey, in which fewer respondents were at least 18 years old). Within the analysis sample, some independent variables are missing a small amount of values,⁴ and we multiply impute missing data using the Amelia package in R (Honaker, King, and Blackwell 2011).

Measures

Mental health. The mental health measure is a five-item short version of the Mental Health Inventory (MHI-5) (Veit and Ware 1983). The MHI-5 is a valid, reliable, and commonly used subscale of the SF-36 instrument used to diagnose mood and anxiety disorders (Berwick et al. 1991; Kelly et al. 2008; Rumpf et al. 2001). Respondents were asked to report how often within the past month (1 = all of the time, 2 = most of the time, 3 = some of the time, and 4 = none of the time) they felt (1) nervous, (2) calm and peaceful, (3) downhearted and blue, (4) happy, and (5) so down in the dumps that nothing could cheer them up. The mental health measure is an average of the answers

across these five questions (with reverse coding for nervous, downhearted and blue, and down in the dumps). The measure ranges from 1 to 4, in increments of .2, with higher values indicating greater mental health problems ($\alpha = .78$).

Criminal justice contact. We measure criminal justice contact with three binary variables indicating that respondents reported an arrest, a conviction, or an incarceration since the date of the last interview. These three measures are not mutually exclusive. At each survey wave, respondents were asked about arrests and, if they reported an arrest, were asked about convictions and incarcerations. NLSY97 surveyors, beginning with the 2004 survey, also reported whether the respondent was interviewed in jail or prison. The incarceration measure therefore reflects both incapacitation post-conviction that occurs during the prior year and incarceration (including pretrial) that occurs during an interview.⁵

Contextual disadvantage. The measure of prior contextual disadvantage is based on county-level census information for a respondent's residence in the first survey (1997) and relies on the following four characteristics, following previous research (Crowder and South 2003; Krivo and Peterson 2000; Krivo, Peterson, and Kuhl 2009; Massoglia, Firebaugh, and Warner 2013; South and Crowder 1999): (1) the percent of residents with income below the poverty level, (2) the percent of the civilian labor force unemployed, (3) the percent of female-headed households, and (4) the percent of households receiving public assistance income.⁶ We use a standardized average of these measures to create an ordinal measure of disadvantage: 0 = less than one standard deviation below the mean (the least disadvantaged counties); 1 = between one standard deviation below the mean and less than 0; 2 = between 0 and less than one standard deviation above the mean; and 3 = at or above one standard deviation above the mean (the most disadvantaged counties). The primary analyses examine variation between the least and

most disadvantaged counties. We considered variations in this measurement in supplemental analyses (described below).

Covariates. The multivariate analyses include time-varying covariates that may render the relationship between criminal justice contact and mental health spurious. Covariates include age, marital status, number of children, educational attainment, school enrollment, number of weeks worked in previous year, income-to-poverty ratio,⁷ urban residence, county-level violent crime rate, and region of the country. All covariates come from the NLSY97, except for the county-level violent crime rate, which is based on rates of violent crime (including murder, rape, robbery, and aggravated assault) from the Uniform Crime Reporting (UCR) Program (U.S. Department of Justice 2000, 2002, 2004, 2006, 2008, and 2010). Some models also include measures of drug abuse (indicating the use of cocaine or other hard drugs in the prior year), alcohol abuse (indicating alcohol use before or during school or work in the prior year), and delinquent behavior (measured by a crime variety scale;⁸ α ranges from .53 to .67 depending on the year).

Analytic Strategy

The analytic strategy proceeds in three stages. In the first stage, we present weighted descriptive statistics. We describe the prevalence of cumulative criminal justice contact, for the entire sample and by race/ethnicity and contextual disadvantage. We then present descriptive statistics of all variables, for the entire sample and by criminal justice contact (none, arrest, conviction, incarceration).

In the second stage, we use ordinary least squares (OLS) fixed-effects models to analyze associations between criminal justice contact and mental health. We conducted a series of diagnostic tests to ensure that OLS models were appropriate.⁹ Fixed-effects models difference out time-stable individual characteristics (Allison 2009), thus estimating how changes in criminal justice contact, such as experiencing an arrest or a conviction, are

independently associated with changes in mental health net of all observed and unobserved time-stable characteristics (e.g., race/ethnicity, childhood poverty, and juvenile delinquency).

We estimate fixed-effects models at four levels of specificity. The first model estimates the unadjusted association between criminal justice contact and mental health. The second model includes most time-varying covariates. The third model further adjusts for three time-varying measures—drug abuse, alcohol abuse, and delinquent behavior—that are likely closely related to criminal justice contact and mental health (Dumont et al. 2012; for a discussion of how drug and alcohol abuse may be indicators of mental health, see Aneshensel, Rutter, and Lachenbruch 1991). This third model is a conservative test of the association between criminal justice contact and mental health, as these measures are likely both exogenous and endogenous to criminal justice contact. Finally, we remove the measures of arrest and conviction from the multivariate analyses, which allows us to consider how much of the association between incarceration and mental health is accounted for by these other types of criminal justice contact. In addition to these four main models, we also differentiate among certain types of criminal justice contact (e.g., current versus recent incarceration, first arrest versus first conviction versus first incarceration, and pretrial incarceration versus incarceration with conviction), and we estimate associations for the three largest racial/ethnic subgroups in the sample: non-Hispanic white, non-Hispanic black, and Hispanic respondents.

In the third analytic stage, we regress mental health on criminal justice contact for respondents who previously resided in the least and most disadvantaged contexts.

RESULTS

Descriptive Characteristics

Cumulative prevalence of criminal justice contact. Figure 1 describes the cumulative prevalence of ever being arrested,

convicted, or incarcerated across survey years. These estimates are weighted and are based on reports of arrest, conviction, and incarceration among individuals 18 years and older. As the figure shows, arrest and conviction are much more common than is incarceration. In 2000, when respondents were between the ages of 18 and 21 years old, 7.3 percent of respondents reported an arrest since the last interview, 3.7 percent reported a conviction, and 1.5 percent reported an incarceration. These rates are all significantly different from each other ($p < .001$). By 2010, when respondents were between 25 and 31 years old, 25.9 percent, 16.4 percent, and 8.3 percent reported an arrest, conviction, and incarceration, respectively, over this period ($p < .001$).

Figures 2 and 3 show that the prevalence of criminal justice contact is socially patterned across race/ethnicity and contextual disadvantage, respectively. For example, across all years, non-Hispanic white respondents have lower rates of arrest, conviction, and incarceration compared to non-Hispanic black respondents (although rates of criminal justice contact among Hispanic and non-Hispanic white respondents are similar).¹⁰

Descriptive statistics of all variables. Table 1 presents weighted descriptive characteristics for the full sample and by criminal justice contact. Across the sample, respondents reported relatively positive mental health; the person-year average is 1.91 on a scale that ranges from 1 to 4 (with higher numbers indicating more impaired mental health). Across all person-years, about 4.8 percent of the sample reported an arrest, 2.6 percent reported a conviction, and 1.6 percent reported an incarceration. Turning to the other characteristics, across all person-years, the average age is 24 and nearly one-quarter of person-years are spent married. The average educational attainment is 13 years, indicating that the majority of respondents graduated from high school. About two-thirds (67.6 percent) are non-Hispanic white, about 14.6 percent are non-Hispanic black, and 12.6 percent

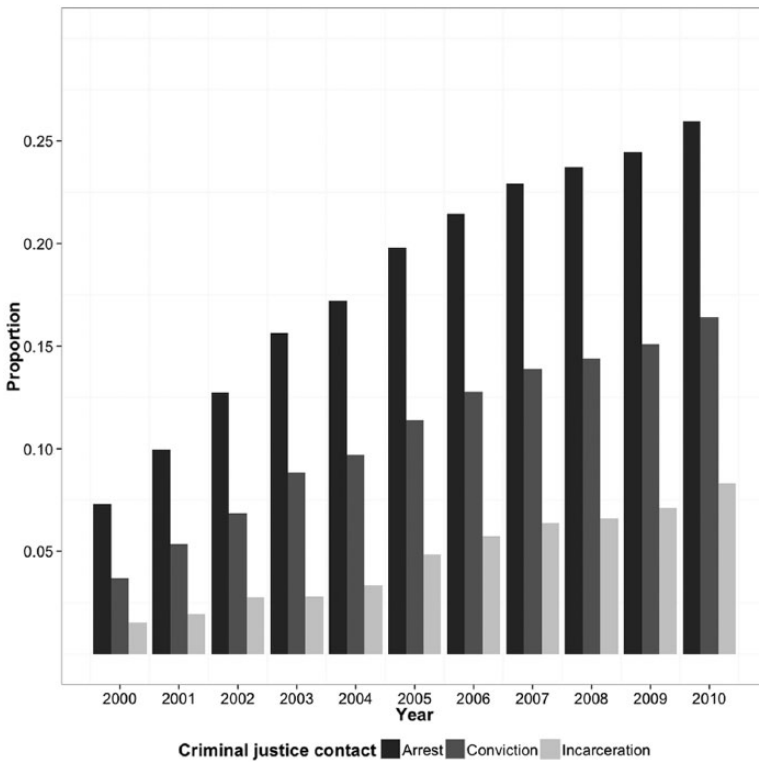


Figure 1. Proportion of Respondents Reporting Any Criminal Justice Contact by Year
Note: Estimates are based on reports of any criminal justice contact since the date of the last interview and are weighted.

are Hispanic. Drug and alcohol abuse in any given year are also relatively uncommon (5.4 and 6.6 percent of the sample, respectively).

Distinguishing by criminal justice contact, we find that respondents with criminal justice contact (arrest, conviction, or incarceration) have higher mental health problems than do respondents with no contact. Respondents with criminal justice contact, compared to those without criminal justice contact, are generally more disadvantaged, as they have higher poverty ratios and are more likely to report substance abuse.

Estimating Mental Health as a Function of Criminal Justice Contact

Fixed-effects models. In Table 2, we estimate fixed-effects models to examine within-individual changes between criminal justice contact and mental health. As the bivariate Model 1 shows, arrest—but not conviction or

incarceration—is independently associated with worse mental health. An arrest is related to a .154-point increase in the mental health scale ($p < .001$), or nearly a one-third (.321) of a standard deviation increase in the scale. In Model 2, which adjusts for an array of time-varying covariates, the association between arrest and mental health persists ($b = .143$, $p < .001$), and the association between incarceration and mental health becomes statistically significant ($b = .051$, $p < .05$). These associations remain in Model 3, which further adjusts for drug abuse, alcohol abuse, and delinquent behavior. This most conservative model shows that arrest is deleteriously associated with mental health ($b = .120$, $p < .001$). It also shows that incarceration, independent of arrest and conviction (which often accompany incarceration), is also associated with poor mental health ($b = .053$, $p < .05$). These results point to a fairly large association between arrest and mental health, at least

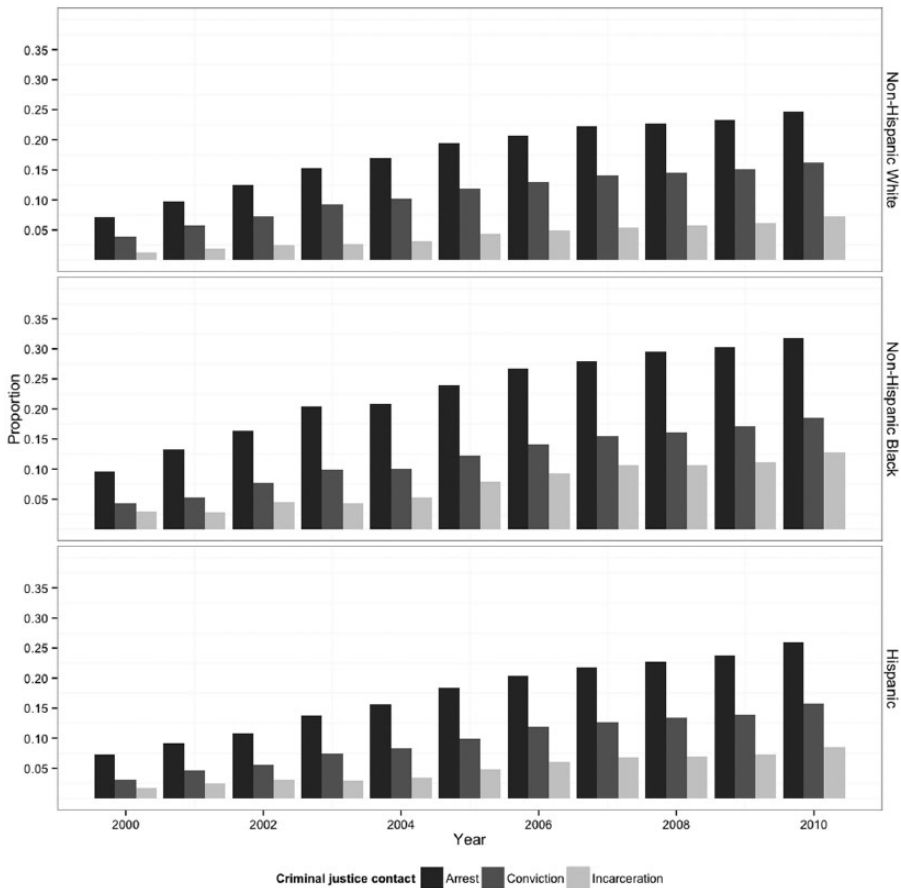


Figure 2. Proportion of Respondents Reporting Any Criminal Justice Contact by Year and Race/Ethnicity
Note: Estimates are based on reports of any criminal justice contact since the date of the last interview and are weighted.

relative to the incarceration coefficient. In additional analyses, we found that arrests are cumulatively related with mental health; each arrest incrementally contributes to deleterious mental health.¹¹

Finally, in Model 4, we omit the measures of arrest and conviction. The incarceration coefficient is nearly twice as large in Model 4 ($b = .099$), compared to Model 3 ($b = .053$), suggesting that not adjusting for arrest and conviction overestimates the relationship between incarceration and mental health.

Alternative measures of incarceration. The fixed-effects models indicate that both arrest and incarceration are independently associated with mental health; however, the

magnitude of the incarceration coefficient is modest compared to the arrest coefficient. The incarceration coefficient represents the average association between incarceration and mental health, and certain forms of incarceration may be more detrimental to mental health than other types. To better understand this, we consider three alternative measures of incarceration in Table 3: (1) those that distinguish between recent and current incarcerations, (2) those that consider only first incarcerations, and (3) those that distinguish between pretrial incarceration and incarceration with conviction.

First, the association between incarceration and mental health may be different for the currently incarcerated compared to the recently incarcerated. The immediate conditions of

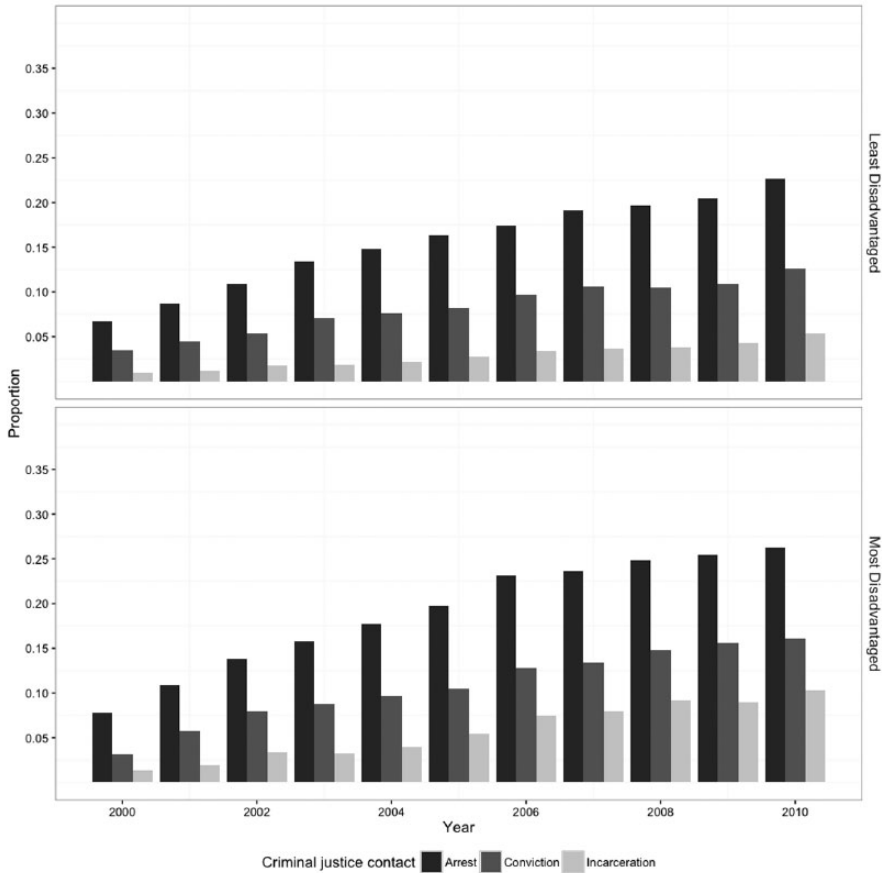


Figure 3. Proportion of Respondents Reporting Any Criminal Justice Contact by Year and Contextual Disadvantage

Note: Estimates are based on reports of any criminal justice contact since the date of the last interview and are weighted.

imprisonment—such as isolation, regimentation, and violence (Goffman 1961; Sykes [1958] 2007)—may be contemporaneously associated with deleterious mental health. Upon release, people may experience relief for not having to endure these conditions and may feel optimistic about the future, while also grappling with the stigma of incapacitation and the stress of transitioning back to the community (Western et al. 2015; see also Turney et al. 2012).¹² Consistent with these ideas, in Model 1 of Table 3, we find that current incarceration (but not recent incarceration) is independently related to mental health. In our most conservative models, the fixed-effects models that adjust for time-varying covariates (including drug abuse, alcohol

abuse, and delinquency), current incarceration is associated with a .083-point increase in the mental health scale ($p < .05$), and recent incarceration is associated with a .025-point increase (n.s.) in the mental health scale.

Second, first incarcerations may be particularly consequential for mental health, and higher-order incarcerations may be less important. Theoretically, there is good reason to believe that the stigma of incarceration and the stress of reentering after incarceration may be more severe for individuals experiencing their first incarceration, compared to those experiencing a higher-order incarceration. In Model 2 of Table 3, we estimate mental health as a function of *first* arrest, conviction, and incarceration, adjusting for

Table 1. Descriptive Statistics for Full Sample and by Criminal Justice Contact

	Full Sample		Criminal Justice Contact			
	Mean/%	SD	None Mean/%	Arrest Mean/%	Conviction Mean/%	Incarceration Mean/%
<i>Dependent variable</i>						
Mental health scale (1 to 4)	1.91	.48	1.90	2.09 ***	2.08	2.09 ***
<i>Explanatory variables</i>						
Arrest	4.79%		.00%	100.00% ***	100.00%	78.11% ***
Conviction	2.60%		.00%	54.32% ***	100.00%	72.44% ***
Incarceration	1.59%		.00%	26.00% ***	44.39%	100.00% ***
Race						
Non-Hispanic White	67.60%		67.81%	65.31% ***	66.96%	53.71% ***
Non-Hispanic Black	14.56%		14.22%	18.94% ***	17.18%	29.22% ***
Hispanic	12.61%		12.62%	12.30%	12.25%	13.09%
Non-Hispanic Other	5.24%		5.34%	3.45% **	3.60%	3.98%
County disadvantage (0 to 3)	1.36	.84	1.36	1.44 ***	1.45	1.51 ***
<i>Time-varying controls</i>						
Age	23.69	3.29	23.72	22.87 ***	23.12	24.30 ***
Married	22.72%		23.51%	8.29% ***	7.52%	8.11% ***
Number of children	.44	.84	.45	.31 ***	.27	.22 ***
Educational attainment	13.13	2.48	13.23	11.45 ***	11.41	10.81 ***
Enrolled in school	26.52%		27.21%	14.47% ***	11.68%	4.10% ***
Number of weeks worked	38.24	18.67	38.71	31.23 ***	30.94	19.63 ***
Poverty ratio	3.78	3.88	3.82	3.14 ***	3.20	2.36 ***
Urban	77.57%		77.71%	76.60%	74.98%	67.66% ***
Violent crime rate (county-level)	-.14	.96	-.14	-.16	-.25	-.30 ***
Region						
Northeast	16.51%		16.60%	14.99%	12.96%	13.28% **
North Central	25.13%		25.04%	26.53%	30.91%	27.31% *
South	36.42%		36.23%	38.90% *	35.42%	43.04% *
West	21.94%		22.12%	19.58% **	20.71%	16.37% ***
Drug abuse	5.37%		4.66%	19.70% ***	19.53%	15.92% ***
Alcohol abuse	6.64%		6.43%	11.42% ***	9.50%	5.56% ***
Delinquent behavior (0 to 6)	.10	.46	.08	.61 ***	.62	.54 ***

Note: Descriptives are based on weighted, nonimputed person-year data; significance tests compare the coefficient to “none.”
 * $p < .05$; ** $p < .01$; *** $p < .001$ (two-tailed tests).

Table 2. Fixed-Effects Models Predicting Mental Health Scale

	Model 1		Model 2		Model 3		Model 4	
	No Controls		Subset of Controls		All Controls		Incarceration Only	
	Coef.	SE	Coef.	SE	Coef.	SE	Coef.	SE
Arrest	.154***	(.016)	.143***	(.016)	.120***	(.016)		
Conviction	-.040	(.024)	-.043	(.024)	-.045	(.024)		
Incarceration	.043	(.026)	.051*	(.026)	.053*	(.026)	.099***	(.022)
Age			-.006***	(.001)	-.004***	(.001)	-.004***	(.001)
Married			-.026***	(.008)	-.024***	(.007)	-.025***	(.008)
Number of children			-.014**	(.005)	-.015**	(.005)	-.015**	(.005)
Educational attainment			-.007**	(.002)	-.007**	(.002)	-.007**	(.002)
Enrolled in school			-.010	(.006)	-.010	(.006)	-.010	(.006)
Number of weeks worked			-.001***	(.000)	-.001***	(.000)	-.001***	(.000)
Poverty ratio			-.001	(.001)	-.001	(.001)	-.001	(.001)
Urban			.011	(.008)	.011	(.008)	.011	(.008)
Violent crime rate (county-level)			.000	(.004)	.000	(.004)	.000	(.004)
Region (ref. = Northeast)								
North Central			-.025	(.023)	-.023	(.022)	-.023	(.023)
South			-.013	(.019)	-.012	(.019)	-.013	(.019)
West			-.054*	(.023)	-.052*	(.023)	-.051*	(.023)
Drug abuse					.101***	(.013)	.106***	(.013)
Alcohol abuse					.059***	(.009)	.060***	(.009)
Delinquent behavior (0 to 6)					.044***	(.006)	.050***	(.006)
Constant	1.900***	(.001)	2.171***	(.031)	2.120***	(.031)	2.127***	(.031)
N (person-years)		42,478		42,478		42,478		42,478

* $p < .05$; ** $p < .01$; *** $p < .001$ (two-tailed tests).

Table 3. Fixed-Effects Models Predicting Mental Health Scale, Variations on Incarceration Measure

	Model 1		Model 2		Model 3	
	Current and Recent Incarceration		First Incarceration		Pretrial & Post-trial Incarceration	
	Coef.	SE	Coef.	SE	Coef.	SE
Arrest	.119***	(.016)				
Conviction	-.036	(.025)				
Current incarceration	.083*	(.037)				
Recent incarceration	.025	(.031)				
First arrest			.089***	(.016)		
First conviction			-.005	(.023)		
First incarceration			.078**	(.028)		
Arrest					.119***	(.016)
Conviction					-.030	(.025)
Incarceration w/ no conviction (pretrial)					.093*	(.043)
Incarceration w/ conviction (post-trial)					.029	(.030)
N (person-years)	42,478		42,478		42,478	

Note: Models include the following controls: age, married, number of children, educational attainment, enrolled in school, number of weeks worked, poverty ratio, urban, violent crime rate, region, drug abuse, alcohol abuse, and delinquent behavior.

* $p < .05$; ** $p < .01$; *** $p < .001$ (two-tailed tests).

time-varying covariates. The coefficients of first arrest ($b = .089, p < .001$) and first incarceration ($b = .078, p < .01$) are comparable.

Third, pretrial incarceration and incarceration after a conviction may be differentially associated with mental health. On the one hand, pretrial incarceration involves more uncertainty about the future, which could worsen mental health. On the other hand, incarceration with a conviction conveys longer-term penalties, which could have consequences for subsequent strains (e.g., employment). In Model 3 of Table 3, we considered this possibility by distinguishing between these two types of incarceration (but keep in mind that respondents experiencing incarceration with a conviction may also have experienced pretrial incarceration). These findings, which adjust for all time-varying covariates, suggest that pretrial incarceration ($b = .093, p < .05$), but not incarceration with

conviction ($b = .029, n.s.$), is associated with mental health.

Variation by race/ethnicity. Because the stress process paradigm suggests that the accumulation of strains and disadvantages, including racial/ethnic minority status, may compound the stress of criminal justice contact, we estimated separate fixed-effects models for non-Hispanic white, non-Hispanic black, and Hispanic respondents (adjusting for all time-varying covariates). In Table 4, we find that the association between criminal justice contact and mental health is similar across these groups.¹³

Considering Variation by Contextual Disadvantage

Finally, in considering the ecological context, we examine whether the associations between

Table 4. Fixed-Effects Models Predicting Mental Health Scale, by Race

	Model 1		Model 2		Model 3	
	Non-Hispanic White		Non-Hispanic Black		Hispanic	
	Coef.	SE	Coef.	SE	Coef.	SE
Arrest	.117***	(.023)	.124***	(.028)	.133***	(.035)
Conviction	-.038	(.034)	-.033	(.047)	-.069	(.053)
Incarceration	.055	(.041)	.061	(.045)	.040	(.055)
Age	-.004**	(.001)	-.005*	(.002)	-.003	(.002)
Married	-.021*	(.009)	-.011	(.020)	-.045**	(.017)
Number of children	.002	(.007)	-.020*	(.009)	-.031**	(.010)
Educational attainment	-.003	(.003)	-.007	(.005)	-.020***	(.006)
Enrolled in school	.002	(.008)	-.041**	(.013)	.000	(.013)
Number of weeks worked	.000	(.000)	-.001***	(.000)	.000	(.000)
Poverty ratio	.000	(.001)	-.001	(.002)	-.002	(.002)
Urban	.013	(.009)	-.002	(.019)	.016	(.023)
Violent crime rate (county-level)	.001	(.006)	.000	(.007)	-.010	(.011)
Region (ref. = Northeast)						
North Central	-.018	(.026)	-.034	(.067)	-.040	(.066)
South	-.026	(.023)	.012	(.045)	-.006	(.050)
West	-.048	(.026)	-.141*	(.071)	-.057	(.058)
Drug abuse	.110***	(.016)	.099***	(.043)	.094***	(.029)
Alcohol abuse	.044***	(.013)	.064***	(.017)	.089***	(.017)
Delinquent behavior (0 to 6)	.042***	(.009)	.048***	(.013)	.042***	(.013)
Constant	2.056***	(.041)	2.145***	(.073)	2.260***	(.080)
N (person-years)	20,514		11,393		9,018	

Note: Reported sample sizes refer to number of person-years. For number of unique individuals: $n = 4,207$ for non-Hispanic white respondents, $n = 2,280$ for non-Hispanic black respondents, and $n = 1,844$ for Hispanic respondents.

* $p < .05$; ** $p < .01$; *** $p < .001$ (two-tailed tests).

criminal justice contact and mental health vary by previous exposure to contextual disadvantage. In Table 5, we estimate separate fixed-effects models for respondents who lived in the least and most disadvantaged counties during adolescence (adjusting for all time-varying covariates).¹⁴ Among respondents who lived in the least disadvantaged counties, we find a statistically significant association between arrest and mental health ($b = .081, p < .05$). Conviction and incarceration are not significantly associated with mental health among these respondents.

These results stand in contrast to estimates for respondents who lived in the most disadvantaged counties. Among respondents living in the most disadvantaged counties, both arrest and incarceration are associated with deleterious

mental health. An arrest is related to a .124-point increase in the mental health scale ($p < .01$), and an incarceration is associated with a .147-point increase in the scale ($p < .05$). Although the differences in the association between criminal justice contact and mental health among respondents residing in the least and most disadvantaged counties are sizable in magnitude, tests for equality of coefficients (Paternoster et al. 1998) suggest these groups are not statistically different from one another.

DISCUSSION

In response to rising incarceration rates, as well as the concentration of incarceration among racial/ethnic minorities, a large literature documents the mostly deleterious

Table 5. Fixed-Effects Models Predicting Mental Health Scale, in the Least and Most Disadvantaged Counties

	Model 1		Model 2	
	Least Disadvantaged		Most Disadvantaged	
	Coef.	SE	Coef.	SE
Arrest	.081*	(.041)	.124**	(.045)
Conviction	-.045	(.061)	-.013	(.075)
Incarceration	.091	(.067)	.147*	(.069)
Age	-.006	(.003)	-.008**	(.003)
Married	-.026	(.021)	-.029	(.021)
Number of children	-.029	(.015)	-.004	(.013)
Educational attainment	-.002	(.006)	-.003	(.007)
Enrolled in school	.015	(.016)	-.016	(.018)
Number of weeks worked	.000	(.000)	-.001	(.000)
Poverty ratio	-.001	(.001)	.002	(.003)
Urban	.023	(.022)	-.031	(.022)
Violent crime rate (county-level)	-.003	(.009)	-.001	(.011)
Region (ref. = Northeast)				
North Central	-.078	(.049)	.025	(.086)
South	-.019	(.032)	.039	(.072)
West	-.041	(.048)	-.013	(.076)
Drug abuse	.125***	(.035)	.014	(.036)
Alcohol abuse	.054*	(.023)	.120***	(.026)
Delinquent behavior (0 to 6)	.023	(.016)	.077***	(.021)
Constant	2.090***	(.075)	2.112***	(.101)
N (person-years)		5,783		4,888

* $p < .05$; ** $p < .01$; *** $p < .001$ (two-tailed tests).

consequences of incarceration for health. Although important, incarceration does not take into account the full reach of the criminal justice system for health. In this article, we draw on the stress process paradigm and use recent nationally representative and longitudinal data from the National Longitudinal Survey of Youth 1997 (NLSY97) to examine whether the stressor of criminal justice contact—defined here as arrest, conviction, and incarceration—impairs mental health.

The results suggest four main conclusions that are grounded in the stress process paradigm (Pearlin 1989). First, we document how criminal justice contact is socially patterned. Arrests, convictions, and incarcerations are more common among non-Hispanic blacks than among non-Hispanic whites and Hispanics. Interestingly, and contrary to the expectations of the stress process paradigm,

we find similar rates of criminal justice contact among non-Hispanic whites and Hispanics. Although this finding is consistent with other research using the NLSY97 (Brame et al. 2014), it is deserving of more attention in future research, as Hispanics are a heterogeneous population and their interactions with the criminal justice system have received less attention than those of non-Hispanic whites or blacks (Patterson and Wildeman 2015; Pettit and Western 2004; but see Muller and Wildeman 2016).

Second, we find that arrest and incarceration—but not conviction—are independently associated with poor mental health. Although there is evidence that some types of incarcerations (e.g., current incarcerations, first incarcerations, and pretrial incarcerations) are more consequential than other forms of incarceration, arrest accounts for nearly half of the

association between incarceration and mental health. We forward previous research on incarceration and mental health (e.g., Schnittker et al. 2012; Turney et al. 2012) by theorizing arrest as a primary stressor that both directly influences mental health and indirectly influences mental health by leading to secondary stressors. Indeed, the stigma, trauma, bureaucratic necessities, and anticipatory stress associated with arrest may be primary stressors that impair mental health (Brunson and Weitzer 2009; Kohler-Hausmann 2013; Pearlin and Bierman 2013). But arrest may also lead to secondary stressors, such as unemployment and relationship instability, that have negative consequences (Frech and Damaske 2012). More fully understanding primary and secondary processes through which criminal justice contact is associated with mental health is beyond the scope of these analyses; however, given the entirety of results—particularly the large association with arrest, the negligible association with conviction, and the role of pretrial detention—we propose that uncertainty and anticipatory stress are primary mechanisms that worsen mental health. Investigating the role of uncertainty and anticipatory stress in criminal justice contact for mental health is an important direction for future quantitative and qualitative research.

Third, we find that the associations between criminal justice contact and mental health are generally similar across racial/ethnic minority groups. Although the stress process paradigm suggests that criminal justice contact may be more deleterious for mental health among racial/ethnic minority groups, our findings of a similar association aligns with prior research on incarceration and health (Massoglia 2008b; Schnittker and John 2007; Turney et al. 2012). We suggest two possible explanations. First, racial/ethnic minorities may have experienced disadvantage saturation, where adult experiences of criminal justice contact no longer have compounding consequences. Second, racial/ethnic minorities without recent arrest, conviction, and incarceration may have experienced other interactions with the criminal justice system

(e.g., police stops, supervision, romantic partner incarceration) that affect their mental health. Because associations are estimated within racial/ethnic groups, it is possible that other forms of unmeasured criminal justice contact experienced by the reference group dampen our estimates for racial/ethnic minorities. That said, even if the associations are similar across race/ethnicity, the disparities in rates of criminal justice contact for non-Hispanic blacks still suggest that this contact increases overall inequalities in population health.

Fourth, in considering the ecological context as part of individuals' stress universe (Aneshensel 2009; Avison 2010; Pearlin 1989; Wheaton 1994), we find that the deleterious consequences of criminal justice contact for mental health are larger among respondents who previously resided in highly disadvantaged contexts. These findings highlight the importance of spatial context in exacerbating or buffering the social determinants of health and suggest one way through which criminal justice contact worsens existing inequalities. Why might associations be more deleterious among people who previously resided in highly disadvantaged counties? County-level disadvantage influences the social meaning and stigma of criminal justice contact, and it reflects labor market characteristics, social services provision, and government policies and practices. These factors, above and beyond individual-level circumstances, may be particularly consequential for coping with incarceration, and indeed, we find that the association between incarceration and mental health is especially harmful in disadvantaged contexts. Because criminal justice contact is spatially concentrated in very disadvantaged areas (Sampson and Loeffler 2010), these findings underscore the importance of considering the ecological context of the stress universe in research on criminal justice contact and health.

Limitations

This study has several limitations that may be improved upon in future research. To begin

with, the NLSY97 survey collects information on arrest, conviction, and incarceration, but it does not have information on other forms of criminal justice contact such as police stops. As highlighted in recent high-profile incidents, police stops are ubiquitous in certain neighborhoods (Lerman and Weaver 2014). Cross-sectional research suggests police stops are associated with trauma and anxiety (Geller et al. 2014) and psychological distress (Sewell et al. 2016), as well as physical health outcomes such as diabetes and obesity (Sewell and Jefferson 2016). In addition to police encounters, parole and probation supervision are other forms of criminal justice contact that likely have consequential impacts on mental health. Indeed, the number of individuals under supervision by either probation or parole is more than double the number of those incarcerated in jails and prisons (Glaze and Kaeble 2014). Therefore, although our findings about arrest, conviction, and incarceration emphasize the importance of these particular forms of criminal justice contact, they almost certainly underestimate the full extent of criminal justice contact for mental health.

Other limitations exist. For example, we assess contextual disadvantage with county-level measures, the smallest geographic units available in restricted NLSY97 geocoded files (<http://www.bls.gov/nls/nlsgeo97.htm>), as opposed to smaller geographic units. Because these are relatively large aggregates, individuals with restricted geographic routines may not directly experience contextual disadvantage, even if they grow up in a poor county. This possibility might explain why criminal justice contact is particularly deleterious in the most severely disadvantaged counties, where there is greater likelihood of routinely encountering disadvantage. Future work using smaller units might find that context matters across a range of disadvantage, as opposed to our finding that negative associations are most apparent in very highly disadvantaged areas.

There may also be important moderating and confounding factors that we could not consider with these data. For example, the

stress process paradigm suggests that coping and social support moderates the associations between stressors and health. Moreover, a potential confounding factor is exposure to violence; although our models account for time-stable violence exposure and time-varying county-level violent crime, time-varying experiences of personal victimization and other types of exposure may be associated with both criminal justice contact and mental health (Eitle and Turner 2002; Sharkey et al. 2012). We are also unable to control for time-varying measures of contextual disadvantage, although our current models account for any time-stable contextual-level factors. The inclusion of these potential confounders is a fruitful area for future research. Finally, our approach cannot eliminate the possibility of reverse causality (e.g., that poor mental health leads to arrest, conviction, and incarceration). Our modeling strategy examines how changes in criminal justice contact (measured in the past year) are associated with changes in mental health (measured in the past 30 days), and it is possible that changes in mental health status preceded criminal justice contact. Although supplementary analyses in the Appendix assuage these concerns, future work should consider other approaches to address reverse causality, such as propensity score matching models.

Conclusions

Notwithstanding these limitations, the findings forward our understanding about the role of the criminal justice system for structuring health and inequality. Our results about arrest are particularly notable, because this is a form of criminal justice contact that does not necessarily reflect criminality and culpability. Although arrest and pretrial detention in jail often carry stigma among the public, conviction is the only criminal justice interaction that is directly linked to guilt and criminality in a court of law. This distinction between criminal justice contact and behavior is important (Lerman and Weaver 2014), because our results suggest that criminal justice contact has salient consequences for

inequality. In this vein, our results complement recent research that finds arrest, conviction, and incarceration have important ramifications for other facets of inequality, such as the avoidance of surveilling institutions (Brayne 2014) and perceived barriers to civic engagement (Lerman and Weaver 2014).

Moreover, the disproportionality of criminal justice contact by race/ethnicity (Brame et al. 2014; Lerman and Weaver 2014) and contextual disadvantage (Sampson and Loeffler 2010) has important implications for situating our findings within the broader U.S. context. For one, racial/ethnic disproportionality in contact, combined with our auxiliary finding that criminal justice contact is generally similarly associated with mental health among non-Hispanic white, non-Hispanic black, and Hispanic respondents, suggests that criminal justice contact—simply by the nature of its distribution—takes a particularly acute toll on the mental health of non-Hispanic black communities. Additionally, the concentration of criminal justice contact in highly disadvantaged areas, combined with our findings that the consequences of criminal justice contact are stronger among individuals who resided in these areas, indicates that the criminal justice system exacerbates existing inequalities in mental health. Furthermore, given the importance of mental health for other life course outcomes—including physical health (Pearlin et al. 2005), socioeconomic status (Miech and Shanahan 2000), and children's well-being (Turney 2011)—the findings suggest that the consequences of criminal justice contact may proliferate beyond mental health and have broad intra- and inter-generational consequences.

APPENDIX

Although fixed-effects approaches with biannual observations are some of the most rigorous statistical modeling strategies available with observational panel data (e.g., Wildeman and Muller 2012), they cannot eliminate the possibility of reverse causality. To help assess this possibility, we conducted two supplemental analyses.

First, we directly tested for an association in the reverse direction. To do this, we estimated criminal justice contact from 2002 to 2010, lagging mental health and the control variables by one wave. We estimated three separate fixed-effects logit models, where the reference group is no criminal justice contact and the outcomes are arrest, conviction, and incarceration, respectively. In these models, mental health is not significantly associated with future criminal justice contact (arrest: $b = .078$, $SE = .082$; conviction: $b = -.023$, $SE = .116$; incarceration: $b = -.074$, $SE = .122$), indicating prior mental health is not predictive of future criminal justice contact net of time-varying covariates.

Second, we estimated the fixed-effects models (equivalent of Model 3 in Table 2) with a subsample that reported low mental health in 2000, which is the first wave of the analysis sample. Because a concern is that individuals with already poor mental health experience criminal justice contact, these analyses estimate associations for a group with few initial mental health issues. We find that results are similar to the results for the full sample, where arrest ($b = .119$, $p < .001$) and incarceration ($b = .048$, n.s.) are deleteriously associated with mental health. The coefficient on incarceration is similar in magnitude but is not significant, which we believe reflects the smaller size of the restricted sample. Taken together, these supplemental analyses largely align with our main findings and suggest that reverse causality is not driving the associations.

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Notes

1. Other forms of criminal justice contact, including police stops and supervisory status, are potentially salient experiences for mental health. Data limitations preclude an examination of these forms of criminal justice contact, a point we will return to.
2. Incarceration can be a formal punishment, as a result of a conviction, but it can also be experienced prior to conviction and sentencing, when individuals are arrested and detained pretrial.
3. Although it is possible to measure police stops—as well as arrest, conviction, and incarceration—in the National Longitudinal Study of Adolescent Health (Add Health), those data are limited in several ways. First, Add Health is a school-based sample, meaning that some individuals who dropped out of school are not included in the sample. Second, the measures of criminal justice contact indicate whether the respondent had *ever* experienced criminal justice contact, which does not allow us to establish proper time ordering between our explanatory and control variables. Third, and most important, criminal justice contact is measured in only one survey wave, precluding a longitudinal analysis that accounts for unobserved, time-stable characteristics.
4. Most covariates are missing fewer than 5 percent of values. An exception is the poverty ratio, which is missing in 20 percent of person-years.
5. For respondents who were incarcerated post-conviction, the average length of the incarceration was 8.17 months.
6. County-level information for households receiving public assistance income was not available for 63 individuals (.7 percent of the sample). For those individuals, we calculated the disadvantage index using an average of the other three characteristics.
7. For survey years 2000 and 2002, income-to-poverty ratio is based on household income. For later survey years, it is based on family income.
8. The crime variety scale is the sum of answers to six questions about intentionally destroying property, stealing items worth less than \$50, stealing items worth more than \$50, committing other property crimes, attacking someone with the intention of seriously harming them, and selling illegal drugs.
9. Diagnostic tests indicate there is some very modest non-normality in the residuals, where 1.6 percent of the sample includes mild outliers (and there is one severe outlier). We re-estimated the main models to exclude mild and severe outliers and the results were consistent with the models presented here.
10. These rates of arrest and incarceration are generally lower than prior estimates, given that we limit reports to respondents surveyed when they were 18 years and older across years 2000 and 2010, and we combine rates for male and female respondents. For example, Brame and colleagues (2014) consider any arrest from ages 8 to 23; descriptively, they

find that 38 percent of non-Hispanic white males, 44 percent of Hispanic males, and 49 percent of non-Hispanic black males have ever been arrested by age 23.

11. When arrest is measured as a count variable, each arrest is associated with an increase in poor mental health ($b = .035, p < .001$).
12. We also examined interactions between incarceration and time since incarceration, and interactions between arrest and time since arrest (although not analogous interactions for convictions, as these timing data are not available), as it is possible that the deleterious associations diminish over time. These interactions were not statistically or substantively significant.
13. In addition to suggesting that racial/ethnic minority status may compound stress, the stress process paradigm suggests that membership in other lower-status groups may compound the stress of criminal justice contact. Accordingly, in supplemental analyses, we considered variation in the association between criminal justice contact and mental health by poverty status and gender. First, we estimated separate models for respondents with low and high poverty ratios (with thresholds at both the median and top/bottom 25 percent). Second, we estimated separate models for men and women. The results suggest that the association between criminal justice contact and mental health does not vary by poverty or gender.
14. In supplemental analyses, we tested variations of the contextual disadvantage measure, including using the median as a threshold for subgroups and including interactions between contextual disadvantage and criminal justice contact among the full sample. When using the median, the magnitude of the association between arrest and mental health is larger in more disadvantaged areas compared to less disadvantaged areas, but the associations for incarceration are similar across contexts. When using interactions, there is no evidence of moderation by contextual disadvantage. Considering these supplemental analyses in conjunction with the findings reported earlier suggests that the consequences of criminal justice contact (and especially, incarceration) for mental health are particularly salient for individuals previously residing in very highly disadvantaged contexts.

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