FINDING WORK:
A SMARTPHONE STUDY OF JOB SEARCHING, SOCIAL CONTACTS, AND WELLBEING AFTER PRISON

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Abstract

The immediate months after prison are a critical transition period, which can determine future trajectories of successful reintegration or recidivism. Finding employment after prison is considered a key, if not the most important, condition to prevent recidivism; however, individuals face numerous obstacles to finding work. Although many of these barriers have been documented, methodological difficulties prevent a thorough understanding of how they impact the actual job searching and working experiences of individuals at reentry.

Using an innovative data collection method—smartphones—this dissertation contributes a detailed portrait of the searching and working trajectories of 156 individuals. Participants were randomly sampled from a complete census of all recent releases to parole in Newark, New Jersey, and were followed for three months. Utilizing these novel data, the dissertation analyzes a) the searching and working experiences of individuals at reentry, b) the use of social contacts for finding employment, and c) the association between emotional wellbeing and job searching. The manuscript also includes a methodological chapter, which describes the strengths and potential challenges of using smartphones with hard-to-reach populations.

Analyses of detailed smartphone measures reveal a reentry period characterized by very short-term, irregular, and poor-quality work. There is substantial heterogeneity across searching and working patterns, where older and less advantaged individuals sustain high levels of job searching throughout the three-month study period. In contrast to prevailing notions in reentry scholarship, individuals are not social isolates or deeply distraught about their job searches; rather, they are highly connected to others and feel happier while searching for work. These results indicate that the low employment rates of reentering individuals are not due to person-specific deficiencies of low social connectivity and poor emotional wellbeing. Reentering individuals, however, remain deeply disadvantaged in the labor market, where they compete for work within a structure of deteriorated opportunities for low-skill, urban, and minority jobseekers more generally. Relegated to the lowest rungs of the market, reentering individuals obtain jobs that are very sporadic and precarious. These findings challenge the established idea that finding suitable employment in today's labor market is an attainable goal for reentering individuals.

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Chapter 1. Introduction

With the expansion of the United States criminal justice system over the past four decades, imprisonment and supervision have become common features of contemporary poverty and urban landscapes (Goffman 2009; Western 2006). Nearly all those who go to prison return to their communities, where they face challenges to find employment, secure housing, address health and addiction issues, and reconnect with family and friends (Travis and Visher 2005; Bushway, et al. 2007). The time period after release from prison—termed "reentry"—is a critical window of time and presents the greatest risks for reoffending; nearly one-third of reentering individuals are rearrested within the first six months (Solomon et al. 2004). Because of challenges to successfully transition from prison back to the community, policy makers and other stakeholders have emphasized the importance of reentry-based research and policy initiatives (Travis and Visher 2005; the Second Chance Act).

The focus on reentry among service providers, government officials, and policy researchers as an important time period for future life chances has not received similar attention in social science scholarship. Rather, social science researchers have often concentrated on the consequences of incarceration for long-term outcomes, such as lifetime earnings, marital statuses, and chronic health issues (Schnittker and John 2007; Western 2006). Within this context, research has tried to identify the causal impact of incarceration (Apel and Sweeten 2010; Kling 2006; Lalonde and Cho 2008; Loeffler 2013; Western, Kling, and Weiman 2001). Although there are exceptions (Apel and Sweeten 2010), most literature explains poor employment outcomes over the long term as the dual results of removal from the labor market due to incapacitation and of stigma from incarceration and felony conviction.

These factors are consequential but they operate within the equally critical context of reentry and transition. It is likely that the reentry process itself—the need to start over, find new employment, obtain a place to live, get a driver's license and identification, and reestablish ties with friends and family—contributes to poor employment outcomes over the long run. The reentry experience is often discussed in terms of weeks, months, and even years (Bushway et al. 2007; Nelson, Deess, and Allen 1999; Visher, Debus, and Yahner 2008), suggesting that the instability and difficulties caused by reintegration are disruptive to long-term trajectories. Moreover, the experience of reentry and transition is likely not an isolated event in the life course of participants. Rather, it is a repeated experience, as two-thirds of individuals will recidivate within three years (Langan and Levin 2002) and reenter their communities once more.

This dissertation focuses on the reentry experience as not simply a byproduct of incapacitation, but as an equally important and consequential dimension of imprisonment. Using new technologies for data collection—smartphones—it examines the immediate months after release from prison, specifically investigating the job searching and employment trajectories of individuals. The project follows the daily experiences of parolees during their first three months after release, and utilizes smartphones to capture in real time the sporadic, unstable, and uncertain experiences of individuals.

The aim of this introductory chapter is to provide a brief background on reentry, supervision, and employment after prison. This chapter also describes the project design that is the basis for the four substantive chapters that follow, as well as an overview of main findings. The hope is that this introduction will not overlap substantially with the background sections of the individual chapters, which will each provide a discussion of the relevant reentry, job searching, and employment literature for that section. As such, the chapters are designed to be

progressive, moving from a description of searching and working patterns at reentry to analyses about potentially important explanatory factors.

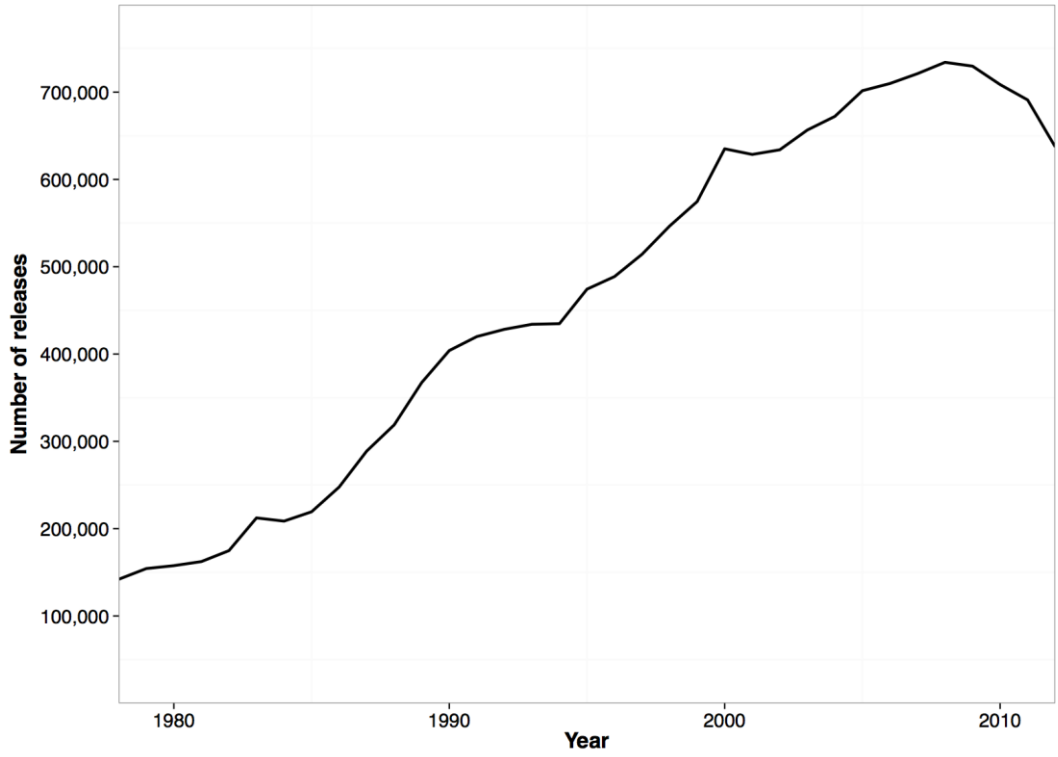
I. BACKGROUND

Reentry and parole supervision

There have been substantial changes in the size and profile of individuals incarcerated and released from prison in the United States. In 1978, at the start of the massive expansion of imprisonment, approximately 150,000 individuals were admitted and released from federal and state prisons, translating into about 415 individuals released per day (see Figure 1.1). In 2008, over 734,000 individuals were released, or over 2,000 individuals per day. In recent years, this number has slightly decreased; however, the large numbers of individuals continuing to return to their communities have created a very different reentry problem compared to four decades ago.

Along with the growth in the numbers incarcerated and released, the profile of those incarcerated has also changed, resulting in a higher proportion of individuals imprisoned for less serious convictions. From 1991 to 2011, the number of admissions for public order offenses doubled, from 8 percent to 16 percent (Carson and Golinelli 2012). Public order crimes include relatively minor offenses such as drunk driving, court offenses, and liquor law violations. In addition to the increased prevalence of public order crimes, the proportion of admissions to prison for violations of supervision also grew rapidly since the early 1980s (see Figure 1.2). Parole violations and other violations of supervision often include behaviors that do not merit incarceration among those unsupervised and are considered to be relatively minor, such as missed appointments or failed drug tests. Although the proportion of admissions due to violations has decreased somewhat in recent years, violations remain a consequential part of the mass incarceration story. The increasing prevalence of public order offenses and parole

Figure 1.1: The number of prison releases in the United States

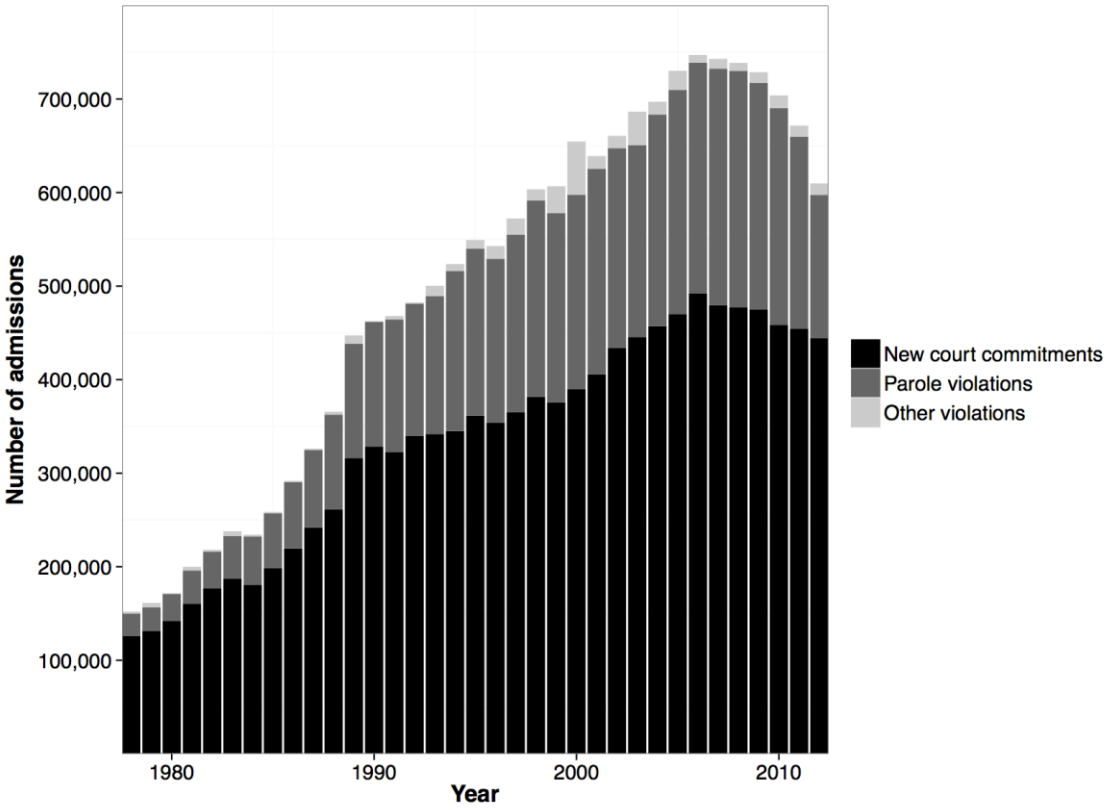


Source: Carson and Golinelli 2012

violations as the most serious offenses for admission to prison suggests that incarceration is no longer reserved for only those that commit the most deviant offenses.

Another major change to criminal justice policy over the last several decades has been the proportion of individuals released from prison to supervision (Travis 2005). In the early to mid 1990s, the great majority of releases (over 80 percent) were conditional, meaning that individuals were placed under some type of supervision in the community (Carson and Golinelli 2012). The reliance on post-release supervision reflects a trend starting in the late 1960s, where the proportion of individuals released conditionally to the community increased rapidly, and it contributes to the increased numbers of individuals reentering prison as a result of parole violations. More recently, the proportion of conditional releases has decreased, and in 2012, 64

Figure 1.2: The number of prison admissions in the United States, by type of admission



Source: Carson and Golinelli 2012

percent of releases were conditional. There are several explanations for these changing proportions over time, such as legislative changes, the parole board's decision to mandate that the individual serve the entire sentence in prison, and the inmate's choice to not pursue early release (Travis 2005). Although the majority of releases from prison still require supervision, the decreasing proportion of individuals released conditionally represents an important trend and a scope condition for this dissertation project, which sampled individuals released from prison to parole supervision.

Reentry and employment

Policy makers, scholars, and practitioners all perceive employment as an important, if not the primary, factor for lessening the risk of recidivism after prison. In a national study of formerly incarcerated individuals, the Urban Institute found that employment and earnings within the first two months were significantly associated with recidivism one year later (Visher et al. 2008). Results from random-assignment studies of reentry employment programs show that the gains from employment are not simply products of selection bias, and even short-term employment interventions have had lasting impacts on future arrest and incarceration, particularly for older individuals (Redcross et al. 2009; Uggen and Thompson 2003; Uggen 2000). A randomized experimental study concluded that short-term employment in the immediate months following reentry lowers recidivism rates at two years post-release, even though employment gains have equalized by that time (Redcross et al. 2009).

Despite these promising findings, there are several reasons to question whether the type of employment available in today's labor market can provide the protective benefits assumed by practitioners, researchers, and stakeholders. The most robust research on employment and lower recidivism is based on cohorts from many decades earlier, at a time when labor markets offered higher quality blue-collar and low-skill jobs (Laub and Sampson 2003; Sampson and Laub 1995). Moreover, recent evaluations of random-assignment employment interventions have produced null and even negative effects, and scholarship that originally suggested the importance of employment for successful reintegration later found less empirical support for these claims (Redcross et al. 2010; Visher, Winterfield, and Coggeshall 2005). Specifically, individuals were less likely to be arrested during the period that they received jobs from the programs; however, these gains were lost when individuals were no longer provided with work.

These studies suggest that employment is beneficial when it is supplied by community organizations through transitional jobs programs; however, when individuals are left to navigate the labor market on their own, they are unable to find work that protects against recidivism. Because the provision of temporary employment is very costly, has few long-term benefits, and cannot practically accommodate the large numbers of reentering individuals, these programs are not sustainable solutions (Solomon et al. 2004). The objective of this dissertation is to take an approach that is different from the majority of recent large-scale, experimentally-based reentry employment studies, by examining in-depth the on-the-ground realities of job searching and working after prison among a smaller group of individuals. In doing so, I aim to better understand the types of employment that individuals find on their own and identify how their job searches might be improved. A fuller understanding of how individuals find work will benefit transitional jobs programs and will improve the effectiveness of reentry employment support services more generally.

Reentry within the context of US inequality

Although this project focuses on the experiences of reentering individuals, the expansion and concentration of incarceration means that reentry is a common life event among certain groups. In 2012, the imprisonment rate among black males was 2,841 per 100,000 residents (or 2.8 percent), whereas the rate among white males was 463 (or 0.46 percent). The imprisonment rate for Hispanic males was 1.2 percent. The cumulative result of these disparities means that approximately one in three black men born in 2003 will experience incarceration in state or federal prison within his lifetime (Bonczar 2003). The disparities by race and gender can be further broken down by educational attainment, where men who have not completed high school are the most likely to be sentenced to state or federal prison. Among black men born in the

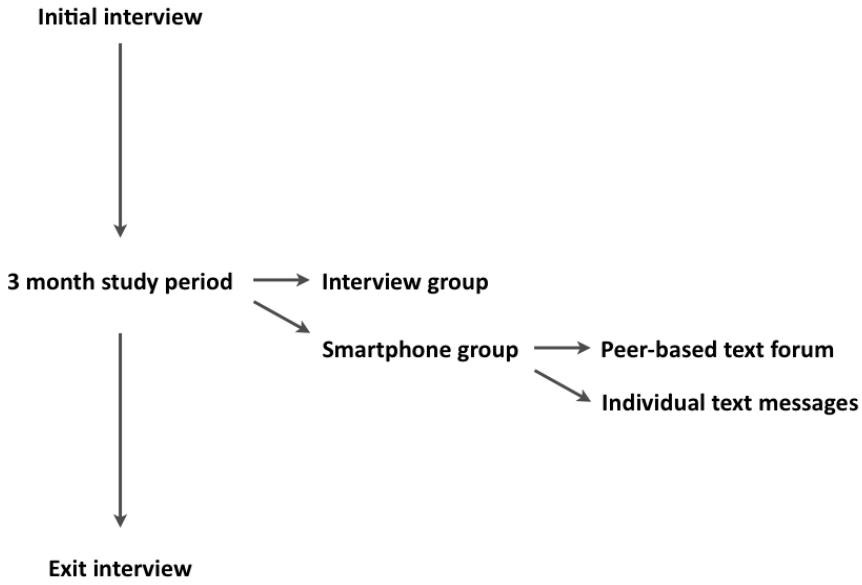
1960s who have not finished high school, nearly 60 percent will experience imprisonment by his mid-30s (Western 2006). The experience of reentry from prison is therefore a transition that the majority of poor, low-skill black men will undergo at some point in their adult lives.

The experiences of reentry, job searching, and poor employment occurs within this context of racial inequality. Those individuals who are already most disadvantaged in the labor market are therefore faced with the compounding barriers of job searching at reentry, exacerbated by the instability of reintegration, a felony conviction and recent prison experience.

II. THE NEWARK SMARTPHONE REENTRY PROJECT

This dissertation analyzes data collected as part of a novel study, the Newark Smartphone Reentry Project (NSRP). The project focuses on the job searching and employment activities of men recently released from prison, and it follows their daily experiences for three months. At recruitment, participants were assigned to either a smartphone group, which sent information through smartphones to researchers in real time, or a control group, which participated in brief interviews with the researcher every other week. Smartphone individuals were also randomly assigned to a peer-based text messaging forum or received individual text messages. This experiment is discussed in greater detail in chapter 3. Because the aim of the project is to utilize smartphones for data collection, the majority of individuals (80 percent) were assigned to the smartphone group. After assignment to one of these two groups, individuals participated in a semi-structured interview that typically lasted 1.5 to 2 hours (see Figure 1.3). Participants in the smartphone group received phones that were installed with a data collection application created for the project and were followed via the phones for three months. Participants in the control

Figure 1.3: Newark Smartphone Reentry Project (NSRP) design

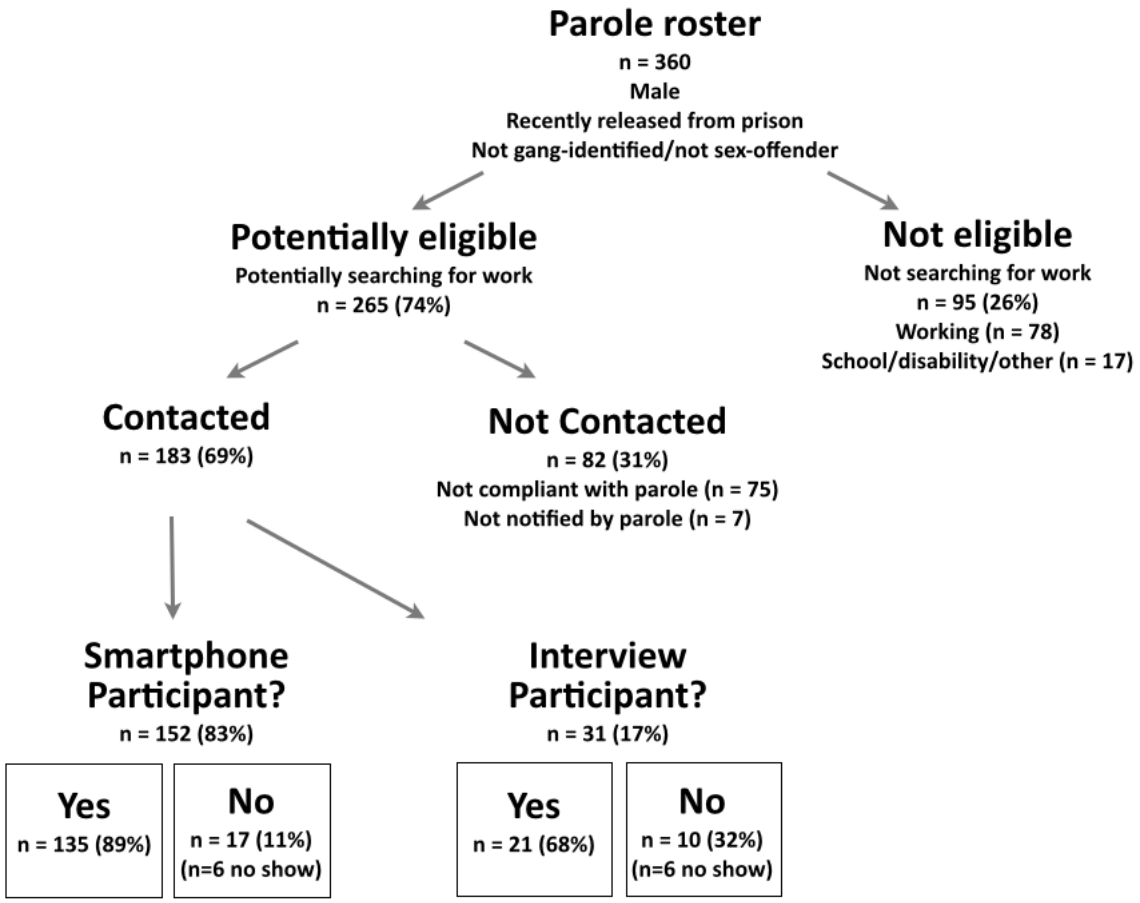


group received similar incentives and phones at the completion of the project. At the end of the three-month study period, individuals in both groups participated in a final, semi-structured interview.

Study sample

Study participants were sampled from a complete census of eligible parolees released from prison to Newark, New Jersey between April 2012 and April 2013. Parolees were eligible to participate if they were male, recently released from prison, searching work, and neither gang-identified nor convicted of a sex offense. To identify eligible individuals, parole officers filtered individuals based on the eligibility criteria and contacted potentially eligible individuals to meet with the researcher about the project. Out of those contacted for the smartphone group, 135 of the 152 individuals agreed to participate in the study (or 89 percent, see Figure 1.4). For the interview group, 21 of the 31 individuals (or 68 percent) participated. A comparison of criminal justice histories among participants with those who were not contacted or who declined

Figure 1.4: Newark Smartphone Reentry Project (NSRP) sample selection



participation suggests that there are no significant differences at or near p-value=0.10 between groups, although the null differences may be partly explained by the small sample sizes (see Table 1.1).

Compared to other reentry survey studies, the project completion rate was relatively high. Among the smartphone participants, 70 percent completed the three-month study period and the final exit interview. Other longitudinal reentry survey studies have completion rates of 42 and 56 percent (Nelson et al. 1999; Visher and Kachnowski 2007). Recent exceptions include reentry studies in Michigan and Boston, which had high completion rates of 86 and 93 percent, respectively (Harding et al. 2013; Western et al. *Working Paper*). However, other limiting

Table 1.1: Characteristics of parolees, by NSRP participations, those not contacted by officers, and those that declined to participate

	Participants N=156		Not contacted N=82		Declined participation N=27	
	Mean	SD	Mean	SD	Mean	SD
Age	35.97	(10.01)	36.41	(9.53)	33.06	(8.71)
Black	0.88		0.83		0.93	
Juvenile arrests	0.58	(1.37)	0.62	(1.29)	0.74	(1.56)
Adult arrests	9.18	(7.12)	10.21	(8.49)	8.48	(6.05)
Adult convictions	5.93	(4.26)	6.24	(4.28)	5.70	(3.57)
Adult incarcerations	0.94	(1.17)	1.09	(1.27)	0.78	(0.97)
Any previous felony	0.76		0.68		0.67	

Notes: there are no significant or marginally significant differences among groups. Information comes from the New Jersey State Parole Board.

factors contributed to these high rates: the Michigan study followed a small group of 22 individuals and the Boston study began with a selected sample of participants. Moreover, these studies did not collect fine-grained, daily measures. Throughout the three-month study period, NSRP smartphone participants sent detailed information on job searching and employment through surveys, and they completed 25,033 of the 31,909 surveys sent to their phones (78 percent). The average participant completed approximately 185 surveys over the 90-day study period.

Project context

The NSRP was situated in Newark, New Jersey during the years 2012 to 2013, and this context provides an important backdrop for the project. Newark is New Jersey's largest municipality, and the Newark parole office supervises the largest number of parolees—nearly 4,000 of the 15,000 in the state. Compared to the rest of the state, as well as the country, Newark is a relatively disadvantaged urban center. In 2012, at the beginning of participant recruitment, the Newark unemployment rate was 13.8 percent, compared to 9.4 percent for New Jersey and 8.1 percent across the United States (Bureau of Labor Statistics). However, these comparisons

do not consider the spatial concentration of imprisonment in particularly disadvantaged neighborhoods and cities (Sampson and Loeffler 2010). Compared to other locales characterized by high rates of crime and imprisonment, such as Detroit, Michigan and Oakland, California, Newark's unemployment rate is quite similar. Scholarship on local context and post-release employment rates suggests that the local unemployment rate is consequential but modest for finding work, and that individual-level employment histories are more important than local conditions (Sabol 2007). This research suggests that the local context of the NSRP may play some marginal role in the job searching and employment findings presented in this manuscript; however, the context is comparable to other cities with high rates of imprisonment and disadvantage.

III. STRUCTURE OF THE DISSERTATION

This dissertation uses novel, person-day information to examine the job searching and employment experiences of individuals after prison. It contributes a new understanding of how disadvantaged jobseekers obtain employment and the types of work they find. It also highlights specific services and activities that employment reentry providers can undertake to help support reentering individuals in their search for work. The chapters progress from a description of job searching and employment trajectories in the immediate months after prison to analyses of particular explanations for searching and working patterns.

Chapter 2, "Pounding the pavement: searching and working after prison," takes advantage of the detailed person-day smartphone measures to document patterns of searching, working, and neither searching nor working over three months. Using sequence analysis methods, the findings differentiate among distinct typologies of searching and working trajectories. Contrary to expectations of human capital and economic search models, the

findings indicate that the least advantaged individuals are more likely to search for work. Among those that do find work, the jobs are particularly poor quality, with many paying minimum or less than minimum wage. In contrast, the more advantaged jobseekers quickly exit the labor market. Although this choice may be logical in the short term given that the labor market offers very poor options for reentering individuals, the consequences of labor market nonparticipation will likely disadvantage individuals in the long run.

Chapter 3, "Going it alone? Social connectivity and employment after prison," examines one theorized explanation for poor employment prospects at reentry: weakened social connectivity and lack of social contacts. Although this idea is often discussed in the reentry literature, empirical evidence is limited, as prior studies have faced particularly thorny methodological limitations involved in measuring and evaluating social contacts for finding work during reentry. This chapter uses real-time observed behavioral and self-reported information on contacts and employment to examine the social networks of reentering individuals and the association between contacts and finding work. It also analyzes searching and working outcomes resulting from an experiment, which connected half of the smartphone participants to others in the project, in order to expand their social networks. In contrast to prevailing notions, the findings suggest that individuals have large social networks and obtain employment through their contacts at similar rates as other jobseekers.

Chapter 4, "Job search and emotional wellbeing at reentry," investigates another proposed explanation for low levels of employment at reentry: poor emotional wellbeing and discouragement with job searching. Reentry scholarship often emphasizes the enormity of employment barriers at reentry, suggesting that negative emotions about job searching in the face of these obstacles might be importantly associated with the probability of searching. Using

person-day reports of happiness and searching, the results find that reentering individuals are actually happier on the days that they search for work. Moreover, negative emotions do not dissuade or discourage further searching; instead, they are associated with a greater probability of searching for work the following day. The findings suggest that emotional distress does not result in exit from the labor market, at least in the short term.

Chapter 5, "Utilizing smartphones to study disadvantaged and hard-to-reach groups," is a methodological chapter on the use of smartphones as data collection tools. A handful of previous studies have discussed the strengths of using smartphones as tools for social science research; however, they often involve student populations or highly selected and advantaged groups. This chapter discusses the advantages and potential challenges of using smartphones among poor, disadvantaged, and traditionally hard-to-reach populations. Using data collected from the smartphone and interview groups, this chapter focuses on four issues that commonly concern social scientists working with hard-to-reach groups: sample selection and attrition, measurement of irregular patterns, data quality, and researcher effects.

Chapter 6, "Conclusions," provides a brief review of the chapters and their findings, identifying major themes and theoretical contributions of the dissertation as a whole. It discusses the implications of these ideas for specific services that could productively assist individuals searching for work at reentry and for broader public policies that might increase higher quality labor market opportunities for low-skill workers.

Chapter 2. Pounding the pavement: searching and working after prison

Obtaining employment at reentry from prison is considered a key factor for successful reintegration and preventing future recidivism. This perception is based on scholarship that finds lower offending levels among individuals who are committed to high quality and stable employment. In today's labor market, where low-skill jobs are precarious, irregular, and poor quality for even those individuals without incarceration histories, the expectation that reentering individuals can find high quality employment seems untenable. This chapter documents the searching and working trajectories of formerly incarcerated men in the immediate months after release from prison using novel, person-day information collected from smartphones. The detailed format of these data reveals a reentry period characterized by greater instability, irregularity, and heterogeneity than previous scholarship suggests. Individuals are relegated to the lowest rungs of the market, cobbling together short-term gigs or exiting the market all together. These findings challenge the prevailing notion that reentering individuals can realistically find high quality jobs that offer benefits and resources necessary to protect against recidivism.

With the rise in incarceration rates since the mid-1970s, imprisonment has become a common life experience among low-income, minority men (Western 2006). On any given day in 2010, three percent of black men were in state or federal prison, and among those in their early 30s, seven percent was currently incarcerated (Guerino, Harrison, and Sabol 2011). The lifetime risk of imprisonment is substantial: given present rates, one in three black men born today will experience incarceration (Bonczar 2003). Nearly all those who go to prison eventually return to their communities. The first few months after release from prison—termed "reentry"—are a critical period and present the greatest risks for reoffending, and nearly one-third of recently released individuals are rearrested within the first six months (Solomon et al. 2004).

Researchers, policy makers, and practitioners all emphasize the importance of finding employment to reduce the risk of recidivism and to promote successful reintegration (Visher, et al. 2008; Bushway et al. 2007; Uggen 2000). The perceived importance of employment is based on fundamental tenets, where work provides financial self-sufficiency, meaningful structure and routine, life satisfaction, and feelings of self-worth (Jahoda 1981; Lageson and Uggen 2013). The protective role of work for crime and recidivism hinges on the ability of employment to provide workers with these rewards, and desistance from crime is associated with employment when it is high quality and stable (Crutchfield and Pitchford 1997; Sampson and Laub 1995).

Much of this scholarship is based on cohorts from several decades ago, and the expectation that individuals recently released from prison in today's context will be able to obtain employment that offers these benefits is questionable. The expansion of the criminal justice system and incarceration over the past several decades has coincided with major shifts in the labor market, which have changed reentry circumstances. Since the 1970s, there has been a growing proportion of poor quality, low paying, and contingent jobs among low-skill workers

more generally (Kalleberg 2011). The deterioration of low-skill work, combined with the disadvantaged labor market position of reentering individuals as urban, minority men with low educational attainment and criminal records, render untenable the idea that formerly incarcerated men will be able to effectively compete with other jobseekers to obtain high quality employment at reentry.

Given today's reentry and labor market contexts, what are the actual job searching and work experiences of individuals after prison? Recent scholarship on reentry finds that individuals have unstable and sporadic employment experiences (Visher and Kachnowski 2007) and that younger individuals frequently move in and out of the labor market (Apel and Sweeten 2010). This research importantly expands our understanding of employment at reentry. However, it is also limited by the use of broad, retrospective measures that cannot capture the level and extent of job instability. These critiques also apply to most research on searching and working among the general population, but they are particularly consequential for reentering individuals. We therefore lack a thorough understanding about how reentering individuals navigate a labor market in which they are highly disadvantaged. Do they actively search for work in the face of tremendous barriers or do they exit the market? Among those that do find work, what types of jobs do they obtain and can those jobs protect against recidivism, as suggested by scholars, policy makers, and practitioners?

In this paper, I employ a unique data set—daily measures of job searching and working gathered from smartphone surveys—to contribute a novel, detailed portrait of search and work after prison. I examine the experiences of 131 individuals, sampled from a complete census of recently released parolees, during the first three months after prison. The use of fine-grained measures collected in real time reveals job searching and working experiences that are

characterized by greater instability, irregularity, and heterogeneity than previous research suggests. The extent of insecurity and mediocrity offered by these jobs challenges the fundamental notion that finding adequate employment is an attainable goal at reentry.

In the following section, I briefly discuss literature on reentry and employment, as well as the many barriers to employment faced by individuals during this chaotic and unstable time period. I then describe how the use of smartphones as real-time data capture tools can improve knowledge about job searching and working at reentry. Section II discusses the sample, data, and methods, and section III reports the findings. Section IV concludes with a discussion of the paper's contributions, its limitations, directions for future research, and policy recommendations.

I. BACKGROUND

The immediate weeks and months after prison are an emotionally intense and turbulent time of adjustment and reorientation. It is a moment that individuals anticipate throughout their incarceration and most have high expectations of reconnecting with family, finding employment, and staying out of prison in the future (Nelson et al. 1999). Although policy-oriented research has focused on this window of time as a critical period of transition, intervention, and study (Travis and Petersilia 2001; Travis and Visher 2005; Visher et al. 2008), the period of reentry (or the weeks and months following prison) is less often emphasized in scholarship on incarceration and inequality. This is unfortunate since the reentry process is experienced by nearly all of those incarcerated, with nearly 700,000 releases from prison each year, and it is a time period with perhaps the greatest potential to be a turning point for long-term trajectories.

Barriers to employment

Finding employment at reentry is viewed as an essential component of reintegration, and the barriers to obtaining work during this erratic time period have long been recognized. As John

Irwin writes in *The Felon*, "The problems of the first weeks are usually staggering and sometimes insurmountable. Becoming accustomed to the outside world, coping with parole, finding a good job—perhaps finding any job—and getting started toward a gratifying life style are at least difficult and for many impossible" (1987:107). Many of the barriers that were encountered by reentering individuals at the time of *The Felon* are relevant today; however, other obstacles are even more difficult now. Since the 1990s, educational, vocational, and transitional planning services offered in prison have substantially declined. Individuals also serve longer sentences in prison, the result of changing policies and conviction profiles. The combination of fewer in-prison services and longer tenures has left individuals less prepared to reenter their communities (Travis and Petersilia 2001).

Upon release, individuals confront a variety of legal and non-legal restrictions resulting from their felony convictions and incarcerations. Legally, they are barred from obtaining jobs in certain regulated professions, which are as varied as bartender, plumber, and telephone solicitor, depending on the state (Stafford 2006). Even without licensing restrictions, employers are hesitant to hire individuals with criminal records, and this aversion is stronger for individuals with felony convictions than for other stigmatized groups such as welfare recipients or GED holders (Holzer, Raphael, and Stoll 2006). An experimental audit study of applicants for low-wage jobs found that the stigma of a criminal record reduces the likelihood of a callback considerably and that the penalties are particularly severe for black applicants (Pager 2007). With technological changes, which enable potential employers to more easily and cheaply access criminal records, stigma associated with criminal records closes the door to many low-skill opportunities. In addition to stigma, time spent in prison erodes job skills among individuals who already have low educational attainment and poor work histories. Scholars suggest that

adaptations to prison settings often entail hyper-masculine behaviors and the deterioration of "soft skills" or the ability to interact and communicate, which are ill-suited for occupations in the outside world (Maruna and Toch 2005; Sykes 2007).

Even with all of these barriers, there are employers who are willing to hire formerly incarcerated individuals and there are reentering individuals who do find some work (Visher and Kachnowski 2007). The firms that never check an applicant's background often hire large proportions of unskilled workers or are smaller, minority-owned companies (Holzer, Raphael, and Stoll 2007). They are not large, well-established companies, like Wal-Mart or McDonalds. Employers like these large firms, which provide menial, low-skill jobs, use online application forms that ask about criminal records to screen out applicants. Instead, the companies that hire individuals with felony convictions often operate on the fringes of the labor market or provide manual, unskilled jobs where criminal convictions are less relevant. If low-skill jobs in retail and fast food represent the bottom rung of poor quality jobs in a contemporary and polarized labor market (Kalleberg 2011), reentering individuals likely compete for poorer quality and less secure jobs that are relegated to a tier below.

Searching and working at reentry

Although scholarship documents extensive barriers to finding employment, we lack comparable understanding of how reentering individuals experience these obstacles at reentry. The survey studies that do exist are limited by high rates of participant selection and attrition, as well as broad, retrospective measures that may not adequately capture turbulent time periods; at the same time, they provide our only description about searching and working at reentry. These studies find that the majority of individuals initially have high hopes for their job searches and appear motivated to find work (Nelson et al. 1999; Visher and Kachnowski 2007). Within the

first three months, however, individuals report very different amounts of time that they spend job searching and working. Among the 77 percent of respondents who report any time searching, individuals spent anywhere from 1 to 72 hours per week searching and contacted anywhere from 1 to over 100 employers (Visher and Kachnowski 2007). About 20 percent of individuals reported working at least one week, and 14 percent were employed at the time of the three-month interview. These summary measures indicate considerable heterogeneity in job search activities and employment experiences, but as fairly broad retrospective measures, they also conceal important detail and variation that occur over time.

Why might individuals have very different patterns of searching and working? Human capital perspectives and economic theories provide some explanations. At a basic level, these frameworks propose that the amount of time and effort individuals devote to their job searches are determined by weighing the costs of searching with the expected benefits of finding employment. For reentering individuals, these costs often include financial expenditures such as transportation and clothing for job interviews (Visher and Kachnowski 2007), as well as the psychological toll of repeated rejections from potential employers (Pager 2007). The benefits include the perceived likelihood of finding work, the financial and psychological resources provided by the job, and compliance with parole requirements to be gainfully employed.

Human capital theories suggest that the most disadvantaged jobseekers, such as individuals who are older, are less educated, have fewer resources and social connections, and have few legitimate job prospects, are less successful at finding work (Becker 1962). Under these assumptions, individuals who are the most disadvantaged in the labor market eventually find that the costs are too great and the benefits too few to actively search for work. In some cases, individuals might initially expect high costs without ever embarking on a job search.

Instead of searching, reentering individuals might return to illicit activities to earn money and gain prestige in criminal markets, in which they have accrued more skills and capital in the past (McCarthy and Hagan 2001).

The same logic of perceived costs and benefits applies to better educated, more advantaged reentering individuals, but for these jobseekers, it is likely that they will persist with searching for a relatively longer time. Because they have more human capital, social connections, and financial resources, these individuals are able to better tolerate the costs of searching and have higher expectations of realistically finding work. Given greater persistence in job searching and longer exposure to potential job openings, a higher proportion of more advantaged individuals will likely find employment before exiting the labor market. Under this set of assumptions, more advantaged jobseekers will search for longer time periods and will be more likely to find work, as compared to their less advantaged counterparts; however, even these individuals will eventually exit the labor market when the costs of searching become untenable.

The idea that reentering individuals commonly exit the labor market, and in some cases do not initiate a job search, is substantiated by recent research. An Urban Institute study found that 23 percent of individuals report not searching within the first several months after release (Visher and Kachnowski 2007). Apel and Sweeten's study of recently incarcerated youth finds that nonparticipation in the labor market accounts for the majority of time that individuals are not working. Although labor market nonparticipation likely involves a return to illicit and criminal activity (Irwin 1987; Lageson and Uggen 2013; Travis 2005; Uggen and Thompson 2003), there are several alternative noncriminal explanations for exit. Individuals may chose to enroll in job training or parole-mandated programs, such as substance addiction services, to better position themselves for a job search in the future. They may have competing responsibilities to family,

such as providing day care, caring for elderly dependents, or contributing to household chores. These explanations—including both the illicit and conventional activities—are consistent with human capital and economic models of job searching, where differences in the cost-benefit relationship over time determine searching intensity and labor market participation.

Age, job searching, and employment. Age is one factor that likely changes the cost-benefit equation among reentering individuals. Although searching costs are substantial among older reentering jobseekers, which are disadvantaged in the competition for physically demanding, low-skill jobs, the perceived benefits of finding employment are likely much higher as well. Older individuals are often more committed to searching for work at reentry, as compared to younger individuals, because of an internal change or new orientation away from criminal activity (Maruna and Toch 2005). Similarly, they may perceive that the disadvantages of future incarceration resulting from illicit, income-generating alternatives are more important compared to their younger counterparts. As Uggen and colleagues write, "Because the costs of being off time [i.e., incarcerated] will be most transparent for ex-prisoners in their 30s and 40s, who compare themselves to others of similar age with steady jobs and families, older men may be especially motivated to get on track in terms of the modal life trajectory" (2005:229). A new psychological disposition and commitment to conventional lifestyles may also explain why employment matters for preventing recidivism among older individuals in particular (Uggen 2000). Based on this scholarship, it is likely that older individuals will be more motivated to find and keep employment, as compared to younger jobseekers.

Smartphones as data collection tools

In this paper, I utilize new methodological tools—smartphones—in order to collect detailed real-time, self-report information on job searching and working among a population that

is traditionally hard-to-reach and to follow over time. These data collection methods enable me to document day-to-day volatility about searching and employment that previous reentry studies were unable to sufficiently capture. Smartphones are programmable mobile phones that include Internet, email, and GPS sensing (Raento, Oulasvirta, and Eagle 2009). Applications installed on smartphones can send survey questions to users at random or specified time intervals, allowing real-time collection of measures that are retrospectively hard to assess. Studies using this data collection design have considered relatively small samples, from dozens to a few hundred participants; however, the detailed, frequent information that can be collected is a prevailing strength for certain types of research questions. For instance, smartphones are particularly suited to study irregular patterns that are difficult to remember (Stone et al. 2007), which are often characteristic of job searching and reentry experiences. Although the majority of studies have been conducted with relatively advantaged groups, such as university faculty or students (Hicks et al. 2010; Raento et al. 2009), some have utilized smartphones to study a broader demographic spectrum of individuals (Mamykina et al. 2008). To the author's knowledge, this is the first study to use smartphones with individuals reentering the community from prison.

In addition to the collection of detailed, real-time information, a potential advantage of smartphones is the ability to track individuals over time with minimal sample attrition. Reentering individuals are a particularly difficult population to follow, as they frequently change residential addresses, do not have their own phone numbers or have service disruptions, and are still reconnecting with family and friends. Due to these issues, findings from previous reentry studies have been limited by relatively high attrition rates. A month-long study of reentering individuals in New York City had a 56 completion rate (Nelson et al. 1999), and a national study followed up with 42 percent of the sample at two time points after release (Visher and

Kachnowski 2007). Although smartphones offer several advantages for studying hard-to-reach populations, they are new social science tools. Potential limitations of using smartphones are described in the following section and in the discussion.

II. DATA, MEASURES, AND METHODS

To describe the job searching and working experiences of individuals at reentry, I analyze data from the Newark Smartphone Reentry Project (NSRP). In this chapter, I restrict the analysis sample to the 131 individuals that sent information via smartphones on the variety of measures considered below. I exclude four individuals with high levels of missing smartphone data.[1]

Data and measures

The data used in this paper come from several sources, including in-person interviews, smartphone-based surveys, encrypted phone call logs, and administrative records on criminal justice histories. The following measures were calculated from these various data sources, as described below:

Job search and employment. Daily measures of job search activities and work experiences were constructed using answers from smartphone surveys. Surveys were sent to participants twice a day. The first survey was sent at a random time during daytime hours between 9am and 6pm, and it asked about specific activities occurring at that moment. The second survey was sent at 7pm daily and asked about activities that occurred earlier in the day. Participants that state that they searched for work or worked on either of these surveys are coded as either searching or working for that day. If they describe both activities, they are coded as

[1] Four individuals completed smartphone surveys on two or fewer days. One of these individuals was unable to complete any smartphone surveys because he felt uncomfortable responding to the survey prompts. He was older (58 years old) and reported serious mental health issues.

working. Participants that state they neither searched nor worked are coded as neither searching nor working (abbreviated in the following text and figures as "nsw").

Employment characteristics. Individuals who report a new job on the 7pm smartphone survey are asked several follow-up questions about the type of work, the hours they worked that day, whether the job is a formal labor market job, whether the employer is a company or an individual person, and what hourly pay they received. In addition to new jobs, participants also reported a substantial number of "old" jobs that were not previously reported during the study period (about 20 percent of total jobs).[2] Because these jobs are previously unknown, I include them in the description of new jobs obtained during reentry. These jobs have information on type of work and are missing information on the other employment characteristics due to differences in the skip pattern of the survey questions. The cases that are missing information are noted in the findings.

Location during daytime hours. Some analyses examine the self-reported locations of individuals during daytime hours, 9am to 6pm. The locations describe contextually relevant places such as an individual's home, a friend's house, a parole-mandated program, etc. The location information is based on self-reported answers from the randomly sent smartphone survey. The design of this survey follows an experience-sampling methodology, where time periods are randomly sampled in order to provide real-time measures of locations and activities during an average day (Shiffman 2007).

[2] Participants might code a job as "old", even if it was not previously reported on the smartphone surveys, for several reasons: first, individuals may have started the job on a day that they skipped a survey; second, individuals may have held the job pre-prison; third, individuals might have reported the job as "old" to avoid answering the additional follow up questions asked of new jobs.

Social contacts. The number and characteristics of social contacts are measured through encrypted phone call logs from the smartphones, as well as through smartphone surveys triggered by phone calls that ask about specific phone interactions that had just occurred. The number of contacts reflects the number of unique, reciprocal phone numbers observed over the study period. The characteristics of contacts, such as the proportion employed and the perceived closeness of contacts to the respondent, are based on answers to surveys that are automatically sent to participants after a phone call or text message is received from a new, unique phone number. Survey answers about these characteristics are aggregated over the study period for each participant.

Demographics and reentry characteristics. Information on demographics and contextual situations at reentry, including shelter residence and physical health, were measured in the initial interview.[3]

Criminal justice history. Criminal justice information was obtained through administrative records, which were provided by the New Jersey Parole Board. The records include information on arrests, convictions, and incarcerations in the state of New Jersey.

Methods

This paper analyzes the daily experiences of job searching, working, and neither searching nor working ("nsw") over the first three months after release from prison. I consider these three person-day states, as opposed to events such as starting or ending a job, because the definition of "employment" is very fluid. It is often not clear when a job actually ends because many individuals work on an as-needed basis. Even among jobs that are more predictable, the number of days worked by week or by month can vary substantially. Individuals may also work several jobs at once, where each contributes only a few hours of employment per week. Because

[3] Information on number of total children is missing for one participant.

of these considerations, the traditional and more commonly used definitions of states and events as "employed" or "unemployed" do not adequately capture the variations and temporality of work at reentry. The inability to construct measures that reflect more permanent states of employment reinforces the advantages of using smartphones to collect real-time information that is detailed enough to capture high levels of volatility.

Using these person-day measures of searching and working, I employ sequence analysis (SA) methods to analyze trajectories over time. SA is not a particular analytic method, such as linear regression or event history analysis; rather, it is a more general approach to study the ordering of events or states (Abbott 1995). In this paper, I use the TraMineR package in R to produce the descriptions of sequences and analyses (Gabadinho et al. 2011).

In order to construct the searching and working sequences, I define sequence length as the time that an individual participates in the project; therefore, individuals who leave the study early are described by sequences that are censored at the participation end date. As described above, 70 percent of the participants completed the 90-day study period. The high-frequency format of person-day data provides detailed information on a very irregular time period, which enables me to capture variations in sequences that would otherwise be missed in more aggregated approaches. However, this approach also means that missing data within sequences are not uncommon. On an average day, 15 percent of observations are missing for participants. There are several possible explanations for missing data, including being busy and not hearing the survey prompts on the phone. The newness of these methods provides little direction on the possible bias of the missing values, such as whether observations are missing at random or if they are more likely to occur because people are searching, working, or nsw. Many of the

methods utilized in this paper directly model censored and missing observations, and I note exceptions when they occur.

In the first part of the analysis, I describe how the proportion of time spent in the states of searching, working, and nsw changes across individuals over the study period. I plot the proportion of states that are inhabited by individuals at each day, from the beginning of the project until the end of the study period. This is known as a state distribution plot, and it provides an overview of searching and working trajectories across all study participants. Although the trajectories contain missing values, the state distribution plots exclude missing states.

The overview of states for the entire sample conceals important heterogeneity among sequences. It is likely that individuals who are older or those that are more disadvantaged in the labor market have different searching, working, and nsw trajectories compared to younger and more advantaged jobseekers. As opposed to grouping individuals based on a priori assumptions, I define different groups, or clusters of individuals, based on their observed sequences. To do this, I first calculate dissimilarity or distance measures, which compare sequences across individuals, and then I cluster sequences by the distance measures into distinct groups.

There are several methods for calculating distances, each with their own specifications for the costs of inserting, deleting, or substituting states into sequences to make them more similar to each other. Optimal matching methods (OM) were first introduced to the social sciences by Abbott and Forrest, and are commonly associated with sequence analysis (Abbott and Forrest 1986; Elzinga 2006). Other common metrics for calculating distances are longest common subsequence (LCS) and OM with empirical costs (OMEC). LCS distances are calculated using the length of the longest common component, or subsequence, within a

sequence and are the suggested method for time-based sequences (Elzinga 2006).[4] These methods typically produce similar results, with differences at the margins. In this paper, I present results from distance matrices calculated using LCS, and I describe how LCS-based findings compare to those using OM and OMEC.

In order to separate individuals into more or less similar groupings, I identify clusters of sequences based on the distance matrices and a hierarchical cluster analysis (Ward Jr. 1963). To determine the number of clusters, I generated different numbers of clusters using LCS, OM, and OMEC. I compared the resultant groupings and chose the number of clusters and the distance method that produced the most similar results across approaches—in this case, four clusters using LCS distances.[5] Generating four typologies with LCS produces substantially different sequences for three clusters and classifies individuals with larger proportions of missing data into a fourth cluster. Approaches that include more than four groups separate out this fourth cluster into smaller groups but do not change the classifications of the other three groups.

Differences among typologies. In the final part of the analysis, I examine demographic, reentry, and criminal justice characteristics by cluster, or typology, to explain the different searching, working, and nsw trajectories. I also separate out the types of new jobs obtained by

[4] OM computes distances that are the minimal cost based on insertions, substitutions, and deletions to sequences. They have been criticized as not having a clear interpretation in the social sciences, as the rationale for calculating distances using minimal costs do not necessarily translate well from their origins in the hard sciences to social states (Elzinga 2006). Mathematically, LCS is actually a special case of OM, where the insertion and deletion costs are set to 1 and the substitution cost is 2 (Gabadinho et al. 2009). OMEC is also a particular case of optimal matching, where the costs are determined by calculating observed transition rates from one state to another (Warren et al. 2013).

[5] The four typology classifications of LCS and OMEC share a high degree of correspondence, where the overlap similarity measure is 0.75 (on a scale from 0 to 1 for perfect similarity, Boriah, Chandola, and Kumar 2008). There is less similarity between the LCS-based typology and the OM with constant costs. With four clusters, the overlap measure is 0.60; however, with five clusters, the overlap increases to 0.73 and looks quite similar to the LCS typologies.

individuals by typology, and I utilize information collected from the random surveys to describe how individuals in these different groups spent their daytime hours. These analyses suggest that there are distinct and conceptually relevant typologies of individuals, who exhibit very different patterns of searching and working at reentry.

III. RESULTS

I first describe the types of jobs that individuals obtain. Over the study period, participants report 168 new jobs (an average of 1.3 jobs per participant). These jobs are primarily construction, warehouse, and maintenance (see Table 2.1). Slightly over 40 percent of the jobs offer full time hours, as opposed to part time or less than part time hours; however, participants state that they do not know the number of working hours for 9 percent of the jobs. About half of the jobs are informal, as opposed to formal labor market employment and an individual person, as opposed to a company, is the employer for 43 percent of the jobs. For 61 percent of the jobs, participants report an hourly wage that is higher than the minimum wage of $7.25 but lower than $12.00. Importantly, 10 percent of the jobs pay less than the minimum wage. Anecdotally, participants received low wages when they worked off-the-books, either as temporary, one-time positions or as probationary periods before being formally added to the employee roster. Taken together, the jobs that individuals obtained over the study period were commonly low quality, informal labor market work with little potential for long-term sustainability.

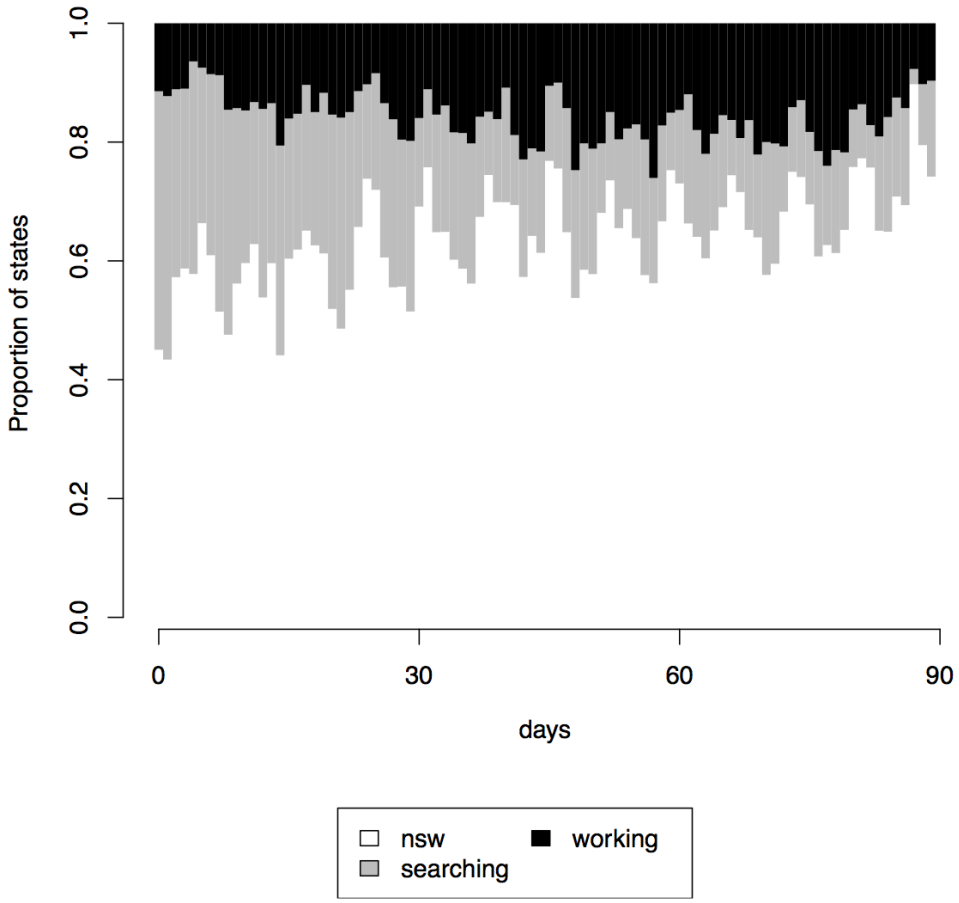
The types of jobs that individuals obtain at reentry are important to bear in mind throughout the remaining analyses. To understand the searching, working, and nsw trajectories of individuals, I first plot the distribution of states across all participants in Figure 2.1. As the

Table 2.1: Characteristics of new jobs, n=168

	%
Type of work	
Construction	25.60
Warehouse	20.24
Maintenance	14.88
Delivery/driver	9.52
Restaurant	4.76
Other service	11.90
Other labor	13.10
*Working hours **	
Full time	41.18
Part time	34.56
Less than part time	15.44
Don't know	8.82
*Labor market **	
Formal labor market	46.38
Informal labor market	50.72
Don't know	2.90
*Type of employer **	
Company	50.72
Individual	42.75
Self-employed	6.52
*Wage **	
Less than $7.25	9.77
$7.25	15.04
$7.26 to $12.00	60.90
More than $12.00	12.78
Don't know	1.50
*Source of work**	
Social contacts	51.80
Job ads/walk-ins	16.55
Parole/caseworker	7.19
Temp agency	17.27
Other	7.19
N	168

Notes : working hours is missing for 32 jobs, labor market and type of employer is missing for 30 jobs, wage is missing for 35 jobs, and source of work is missing for 29 jobs.

Figure 2.1: Distribution of states at reentry from prison, n=131



Notes: The figure describes three states. Individuals that report they neither searched for work nor worked are coded as "nsw."

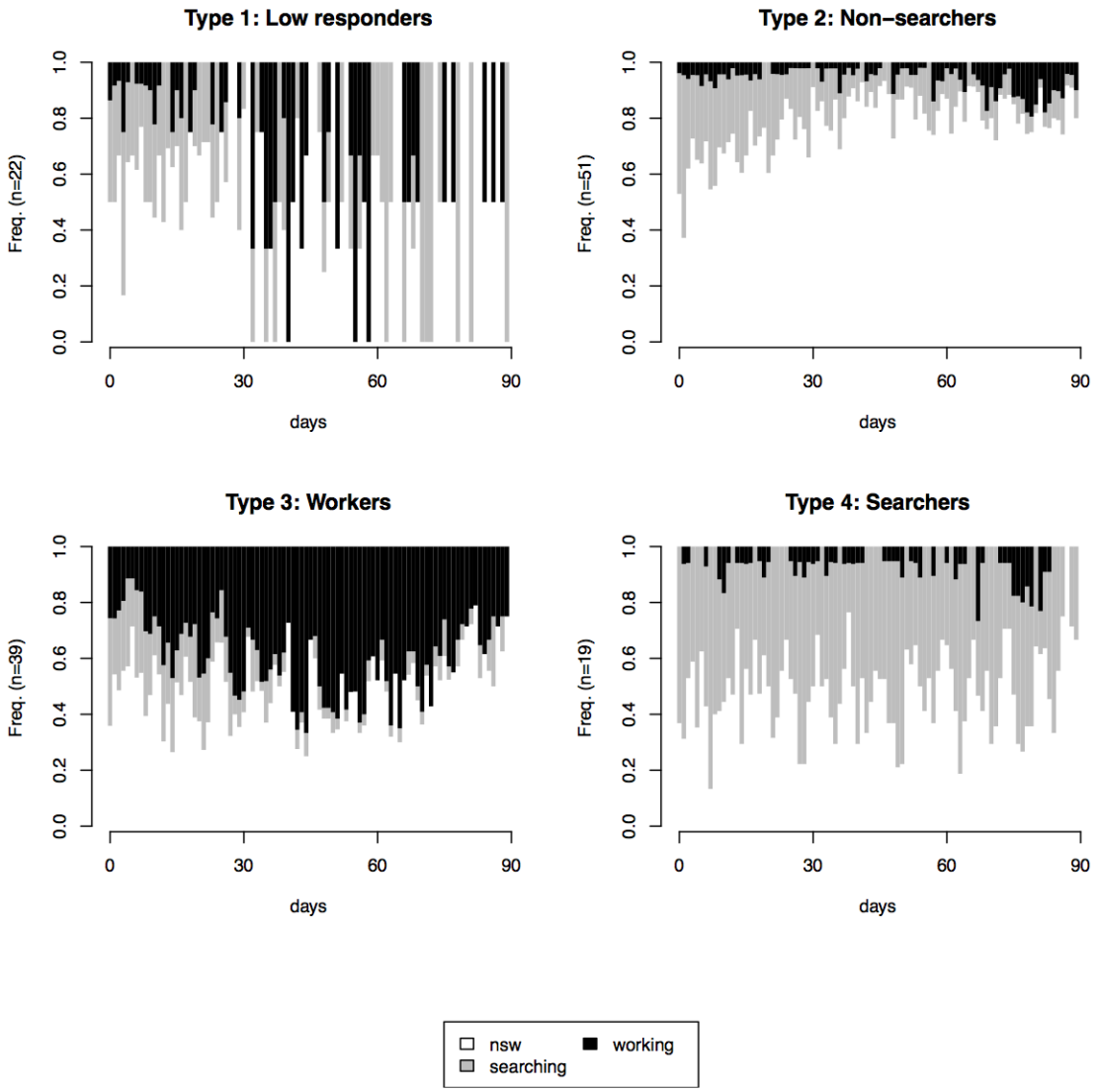
figure shows, participants initially spend about 40 to 50 percent of their days searching for employment. About 10 percent of days are spent working and the remaining time is spent neither searching nor working. As time progresses, slightly more individuals spend their days working but the number of individuals searching for work concurrently decreases, as more and more time is spent neither searching nor working. After a month and a half, about 20 percent of time is spent working and the majority of time is spent neither searching nor working.

Typologies. The state distribution plot shows a clear trend of decreasing search time and increasing work time, with the majority of days spent neither searching nor working. However,

the plot aggregates states across all individuals, which conceals important variation among individuals. Figure 2.2 describes state distribution plots for four typologies of individuals, based on LCS distances and clustering methods. Type 1 individuals are characterized by higher levels of missing data, compared to the other types, and the proportion of time spent in the different states is better assessed in Figure 2.4. In contrast to Type 1, Type 2 shows a consistent pattern, similar to the state distribution plot across all participants, with initially high levels of searching that decrease as time progresses. Type 3 describes a much higher proportion of time working and Type 4 describes a much higher proportion of time searching. Overall, Type 2 describes the most common trajectory (n=51 or 39 percent of participants). Types 3 and 4 are less common, representing 30 and 15 percent of the sample, respectively. For the rest of the paper, I refer to Type 1 individuals as "low responders", Type 2 individuals as "non-searchers," Type 3 individuals as "workers" and Type 4 individuals as "searchers."

Figure 2.3 examines transition rates among states and across typologies. Given an initial state, the figure describes the amount of stability or change from the initial state to a subsequent state on the next observed day. Among non-searchers, an initial state of neither searching nor working (nsw) is highly predictive of the next, subsequent state as also being nsw, and 84 percent of transitions move from nsw to nsw. The relative stability of transitions from nsw to nsw is also observed among workers and searchers, but to a lesser degree (64 and 57 percent, respectively). Among workers with an initial state of working, the majority of subsequent states are also working, where 66 percent of transitions are movements from working to working. For comparison, the proportions of working-to-working transitions among non-searchers and

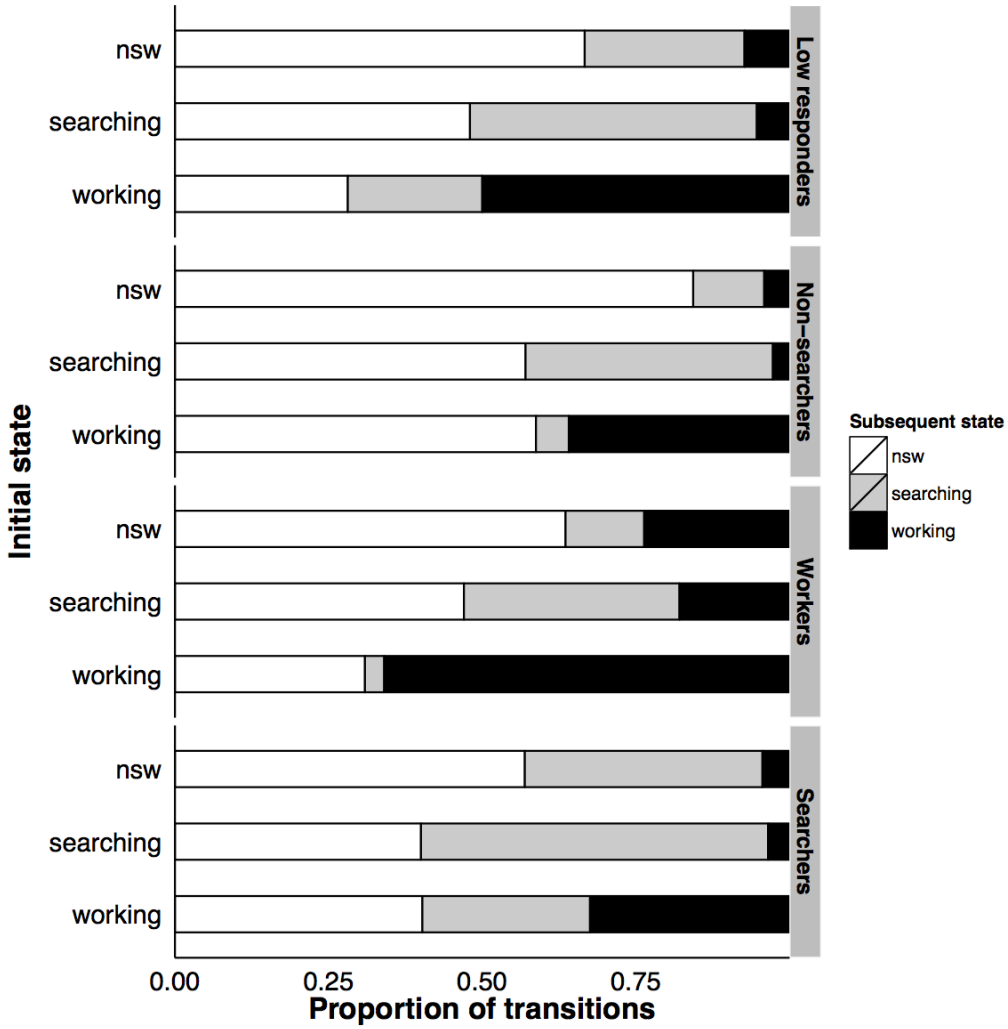
Figure 2.2: State distributions by typology, n=131



Notes: The figure describes three states. Individuals that report they neither searched for work nor worked are coded as "nsw."

searchers are much lower (36 and 32 percent, respectively). In other words, among searchers that work one day, less than one-third of individuals also work the following day. Examining transition rates among states reveals the extent of instability of work, where working consecutive days in a row is not common among most reentering individuals.

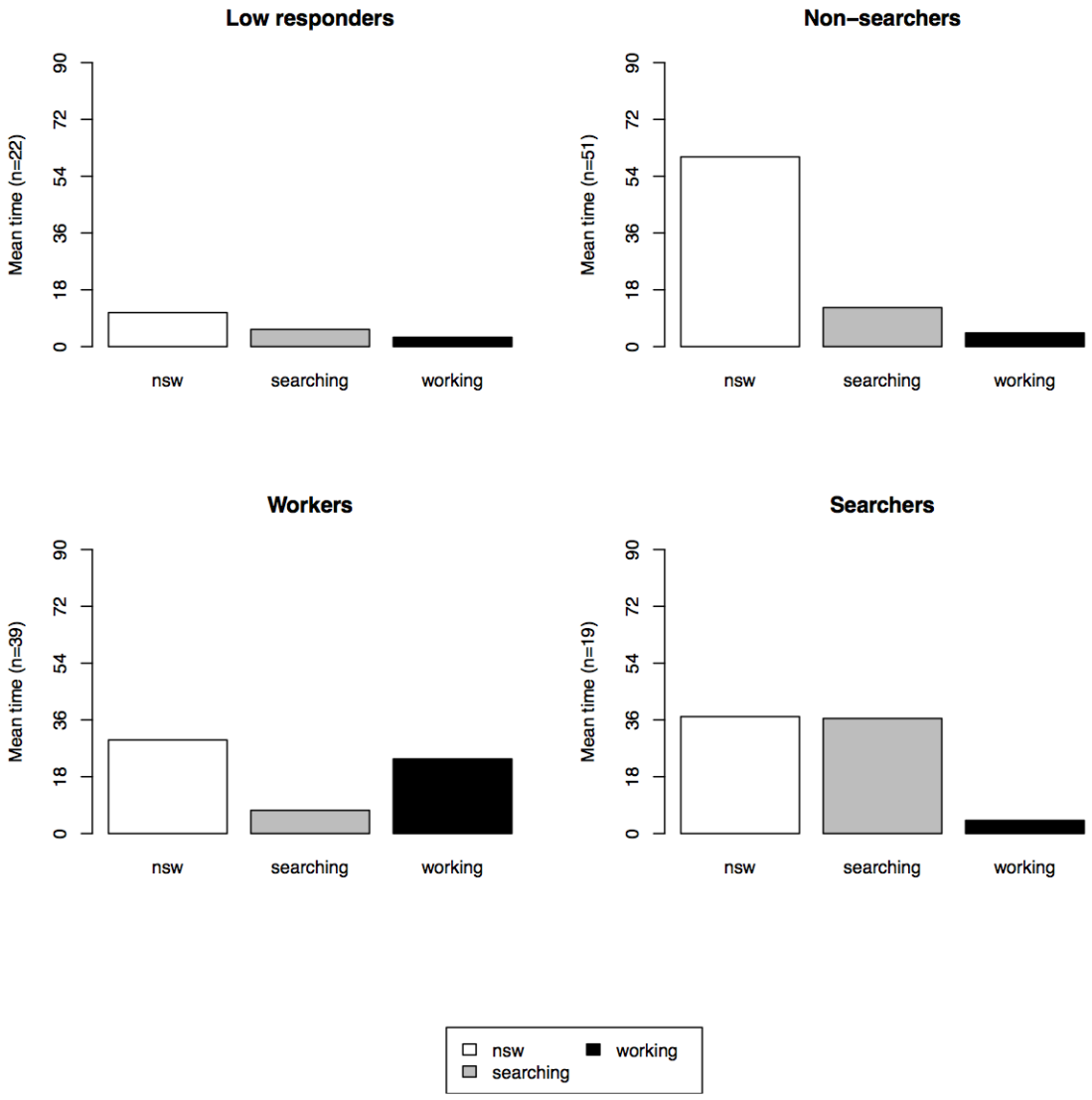
Figure 2.3: Transition rates among states, by typology, n=131



Notes: The figure describes three states. Individuals that report they neither searched for work nor worked are coded as "nsw."

Figure 2.4 describes the total amount of time that participants spend in each of the three states across the entire study period. Although Figure 2.4 does not show the changing proportions of states over time, as with the state distribution plots in Figure 2.2, it provides a useful overview of mean time by type and state. Figure 2.4 also more clearly describes the days spent searching, working, and neither searching nor working for low responder individuals, who look relatively similar to the non-searchers but have higher levels of missing person-days throughout the three months. Across all of the typologies, it is important to note that individuals

Figure 2.4: Mean time spent in each state, by typology, n=131



Notes: The figure describes three states. Individuals that report they neither searched for work nor worked are coded as "nsw."

spend time both searching and working, but it is the proportion of days devoted to each of these activities that distinguish the typologies. Therefore, non-searchers spend a modest amount of their time working even though most of their time is spent neither searching nor working. Similarly, individuals classified as workers work for many days over the study period, but they also spend some time searching for work. Individuals classified as searchers find work

occasionally throughout the study period but devote a substantial amount of time searching for work. Importantly, there is no group of individuals that does not dedicate some amount of time to job searching.

The comparison between non-searchers and searchers presents an interesting contrast, since both groups search for work initially but searchers sustain high levels of job searching throughout the entire study period. Table 2.2 presents demographic, reentry, and criminal justice characteristics by typology, with significance tests comparing non-searchers and searchers. There are several important differences between non-searchers and searchers. Compared to non-searchers, searchers have fewer social contacts, they report that they are less close to the contacts that they do have, and they report lower levels of social support. They have much higher rates of shelter residence at reentry (26 percent compared to 8 percent), current mental health diagnoses (11 percent compared to 8 percent) and are significantly older (average age of 45 years compared to 34 years). In all of these areas, they appear less advantaged in the labor market compared to the non-searchers. One exception is that searchers have higher levels of educational attainment; however, educational attainment could relate to their older age and more opportunities to enroll in job training programs. Overall, these findings—that disadvantaged jobseekers are more likely to search for work—contrast with expectations from human capital and economic search perspectives. These findings do align, however, with reentry scholarship that suggests that older individuals are more committed to finding employment in the labor market.

Examining the types of jobs that searchers obtain further contributes to the picture of disadvantage that they experience in the labor market (see Table 2.3). Only 20 percent of new

Table 2.2: Descriptive characteristics, by typology

	Full sample (a)		Low responders (b)		Non-Searchers (c)		Workers (d)		Searchers (e)		
	Mean/%	SD	Mean/%	SD	Mean/%	SD	Mean/%	SD	Mean/%	SD	
Characteristics at reentry											
Number of contacts	40.92	(31.65)	25.55	(32.56)	49.59	(34.09)	39.92	(30.56)	37.53	(16.78)	
Employed contacts: proportion	0.70	(0.22)	0.79	(0.22)	0.66	(0.22)	0.68	(0.24)	0.77	(0.17)	*
Closeness of contacts: 0 to 100	71.76	(18.14)	71.02	(23.95)	72.88	(18.21)	74.13	(13.77)	64.88	(17.69)	†
Social support scale: 0 to 5	4.01	(1.18)	4.09	(0.92)	4.02	(1.27)	4.15	(1.01)	3.58	(1.46)	
Age: yrs	35.80	(10.07)	36.82	(10.88)	34.37	(9.65)	32.85	(8.59)	44.53	(8.55)	***
Black	90.84		86.36		90.20		92.31		94.74		
Education											†
Less than HS	28.24		31.82		33.33		23.08		21.05		
HS graduate/GED	45.80		50.00		45.10		53.85		26.32		
Some college	23.66		18.18		19.61		20.51		47.37		
College	2.29		0.00		1.96		2.56		5.26		
Relationship status											
Single	48.09		59.09		47.06		41.03		52.63		
Partner	46.56		31.82		47.06		56.41		42.11		
Married	5.34		9.09		5.88		2.56		5.26		
Total children	1.55	(1.47)	1.52	(1.72)	1.65	(1.57)	1.15	(0.90)	2.16	(1.71)	
Self-reported health	2.24	(1.16)	2.18	(1.26)	2.33	(1.21)	2.18	(1.19)	2.21	(0.85)	
Mental health diagnosis	9.16		18.18		7.84		5.13		10.53		
Living in a shelter	15.27		22.73		7.84		15.38		26.32		
Length of recent incarceration	4.22	(3.72)	5.36	(4.96)	3.79	(2.91)	3.68	(3.59)	5.13	(4.14)	
Pre-incarceration factors											
Age at first incarceration	24.10	(6.58)	23.61	(6.18)	24.55	(6.35)	22.52	(5.73)	26.72	(8.59)	

Table continued on next page

Any formal labor market job	78.63		77.27		80.39		69.23		94.74		†
Any felony conviction	77.86		68.18		78.43		82.05		78.95		
Number of convictions	6.01	(4.16)	5.95	(4.61)	5.84	(3.60)	6.15	(4.69)	6.21	(4.20)	
Number of incarcerations	0.98	(1.19)	1.32	(1.32)	0.82	(1.07)	0.85	(1.09)	1.32	(1.45)	
N	131		22		51		39		19		

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

Notes: statistical significance tests compare the characteristics of the non-searchers with the characteristics of the searchers. Fisher's exact test is used for the categorical variables of education and relationship status. Sample t-tests are used for the other variables.

jobs provide full time working hours and 75 percent of the jobs are informal. The majority of jobs come from a social contact (or 60 percent). The instability of few working hours, sporadic employment, and off-the-books work indicates that the work they temporarily find offers very little security or future prospects of self-sufficiency.

Turning to the individuals classified as workers, who obtain work comparably quickly and work for the majority of time, these individuals do not appear obviously advantaged compared to the other individuals. They have higher rates of shelter residence compared to non-searchers and only 69 percent have held any formal labor market job (see Table 2.2). Examining the types of jobs they obtain, workers are more commonly employed in the informal labor market compared to non-searchers and they make a relatively low hourly wage, with about one-third of jobs paying the minimum wage of $7.25 or less (see Table 2.3). However, the jobs that workers find provide more full-time working hours compared to non-searchers and searchers, suggesting that their overall earnings are potentially higher. Drawing on human capital and economic search models, these findings initially appear to stand in contrast with their predictions. However, an alternative explanation, which is also in line with these perspectives, is that the individuals classified as workers are willing to work in very low paying jobs that offer adequate working hours. In contrast, the non-searchers may be unwilling to make this compromise.

In the final part of the analysis, I assess potential explanations for labor market nonparticipation among the non-searchers. I use answers collected from the experience sampling and daily smartphone surveys to explore three explanations for nonparticipation. First, I examine whether non-searchers spend more time at parole-mandated programs or educational programs. Daily attendance at parole-mandated programs, which are commonly referred to as

Table 2.3: Characteristics of new jobs, by typology

	Full sample (a)	Low responders (b)	Non-searchers (c)	Workers (d)	Searchers (e)
Type of work					
Construction	25.60	31.58	27.87	18.03	33.33
Warehouse	20.24	21.05	24.59	22.95	3.70
Maintenance	14.88	21.05	16.39	11.48	14.81
Delivery/driver	9.52	5.26	11.48	9.84	7.41
Restaurant	4.76	0.00	6.56	4.92	3.70
Other service	11.90	10.53	6.56	16.39	14.81
Other labor	13.10	10.53	6.56	16.39	22.22
*Working hours **					
Full time	41.18	57.14	35.29	50.98	20.00
Part time	34.56	42.86	37.25	27.45	40.00
Less than part time	15.44	0.00	17.65	9.80	35.00
Don't know	8.82	0.00	9.80	11.76	5.00
*Labor market **					
Formal labor market	46.38	57.14	50.94	47.06	25.00
Informal labor market	50.72	42.86	43.40	50.98	75.00
Don't know	2.90	0.00	5.66	1.96	0.00
*Type of employer **					
Company	50.72	50.00	50.94	58.82	30.00
Individual	42.75	14.29	43.40	41.18	65.00
Self-employed	6.52	35.71	5.66	0.00	5.00
*Wage **					
Less than $7.25	9.77	7.14	10.00	12.24	5.00
$7.25	15.04	14.29	10.00	20.41	15.00
$7.26 to $12.00	60.90	50.00	68.00	48.98	80.00
More than $12.00	12.78	28.57	12.00	14.29	0.00
Don't know	1.50	0.00	0.00	4.08	0.00
*Source of work**					
Social contacts	51.80	35.71	48.15	56.86	60.00
Job ads/walk-ins	16.55	14.29	18.52	17.65	10.00
Parole/caseworker	7.19	21.43	3.70	5.88	10.00
Temp agency	17.27	0.00	25.93	17.65	5.00
Other	7.19	28.57	3.70	1.96	15.00
N	168	19	61	61	27

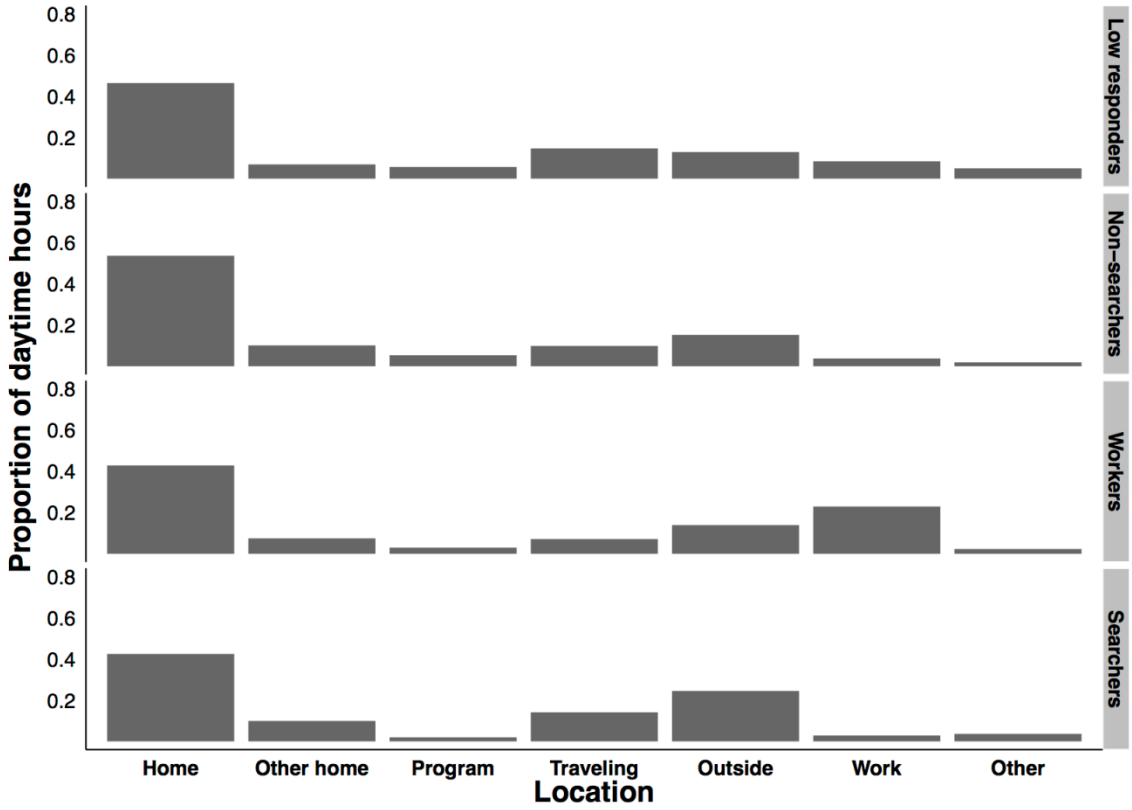
* Information is missing for 5 of 19 jobs (low responders); 7 to 11 of 61 jobs, depending on the variable (non-searchers); 10 to 12 of 61 jobs (workers); 7 of 27 jobs (searchers).

day reporting programs, might explain why non-searchers spend less time searching and working if attendees have less time to search or choose to postpone their search until program completion.

Based on answers from the daily surveys, non-searchers are more likely to attend day reporting programs compared to searchers. Non-searchers attend day reporting programs for 10 percent of days, compared to searchers who attend for 4 percent of days. However, they are slightly less likely to attend other types of mandatory programs (9 percent of days compared to 11 percent of days among searchers). Although non-searchers spend more time at the day reporting programs, I suggest that attendance at these programs should not lead individuals to delay job searching. In fact, individuals at the day reporting programs are allowed to leave for a variety of reasons, including job searching and working. Using reports from the experience sampling surveys, which randomly sample time periods throughout the day, Figure 2.5 describes the proportion of daytime hours spent in various locations, including mandatory programs. Compared to searchers, non-searchers spend a greater proportion of their time at parole-mandated programs (0.05 compared to 0.02, p-value=0.006), although attendance at these programs represents a very modest amount of time overall.

Non-searchers may also cease searching for work because they enroll in job training programs or other educational classes, in order to increase their chances for employment in the future. To help assess this explanation, I examine answers on the daily survey, which describe in participants' own words their daily positive and negative experiences. A few participants (n=5) describe enrolling in school; however, they often first search for work or continue their searching efforts throughout school attendance. Figure 2.6 displays answers for one participant classified as a non-searcher. As the figure shows, this participant continued to his sporadic efforts to search for work even after talking to the school's admissions department and starting school.

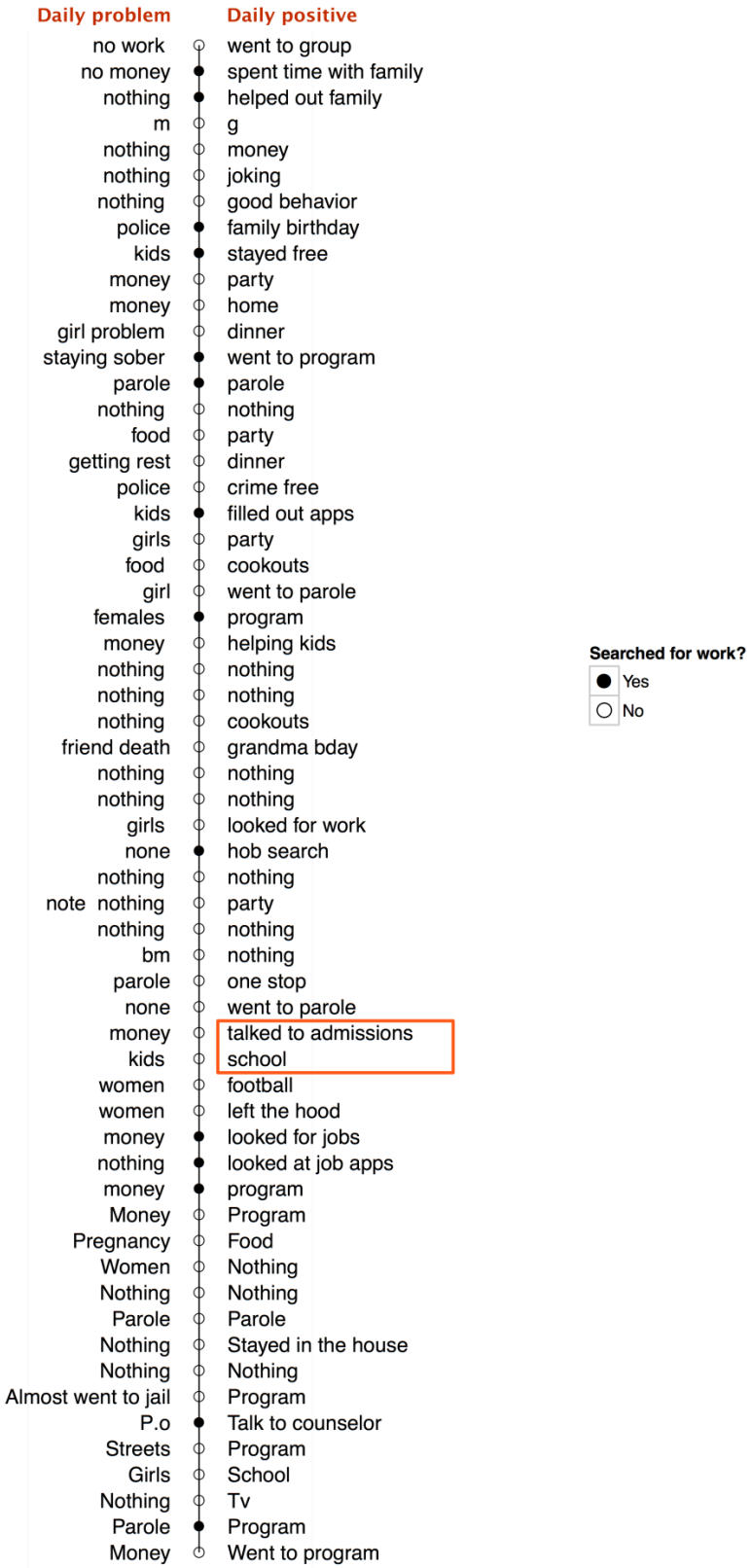
Figure 2.5: Locations during daytime hours, by typology, n=131



Notes: daytime hours refers to 9am to 6pm.

A second explanation for labor market nonparticipation is that non-searchers have competing responsibilities to family and friends, such as the provision of in-kind resources including babysitting or household help. Compared to searchers, non-searchers spend a greater proportion of their time at home (0.54 compared to 0.42, p-value=0.05, see Figure 2.5). Based on the experience sampling survey answers, they also report spending more time on household chores and errands (46 percent) compared to non-searchers (40 percent). Although these differences are not significantly different, they indicate that non-searchers spend much of their daytime hours at home and taking care of household needs. Moreover, an examination of participants' answers about daily positive and negative experiences suggests that a small number of non-searchers had responsibilities to sick family members (n=2), or were dealing with their

Figure 2.6: Reentry experiences of a "non-searcher" who enrolled in school



own health issues (n=2), which prevented them from job searching. Figure 2.7 describes the answers for one participant, whose wife was undergoing serious health complications. As the figure describes, this participant searched for work soon after release but ceased searching when his wife become very sick and was hospitalized.

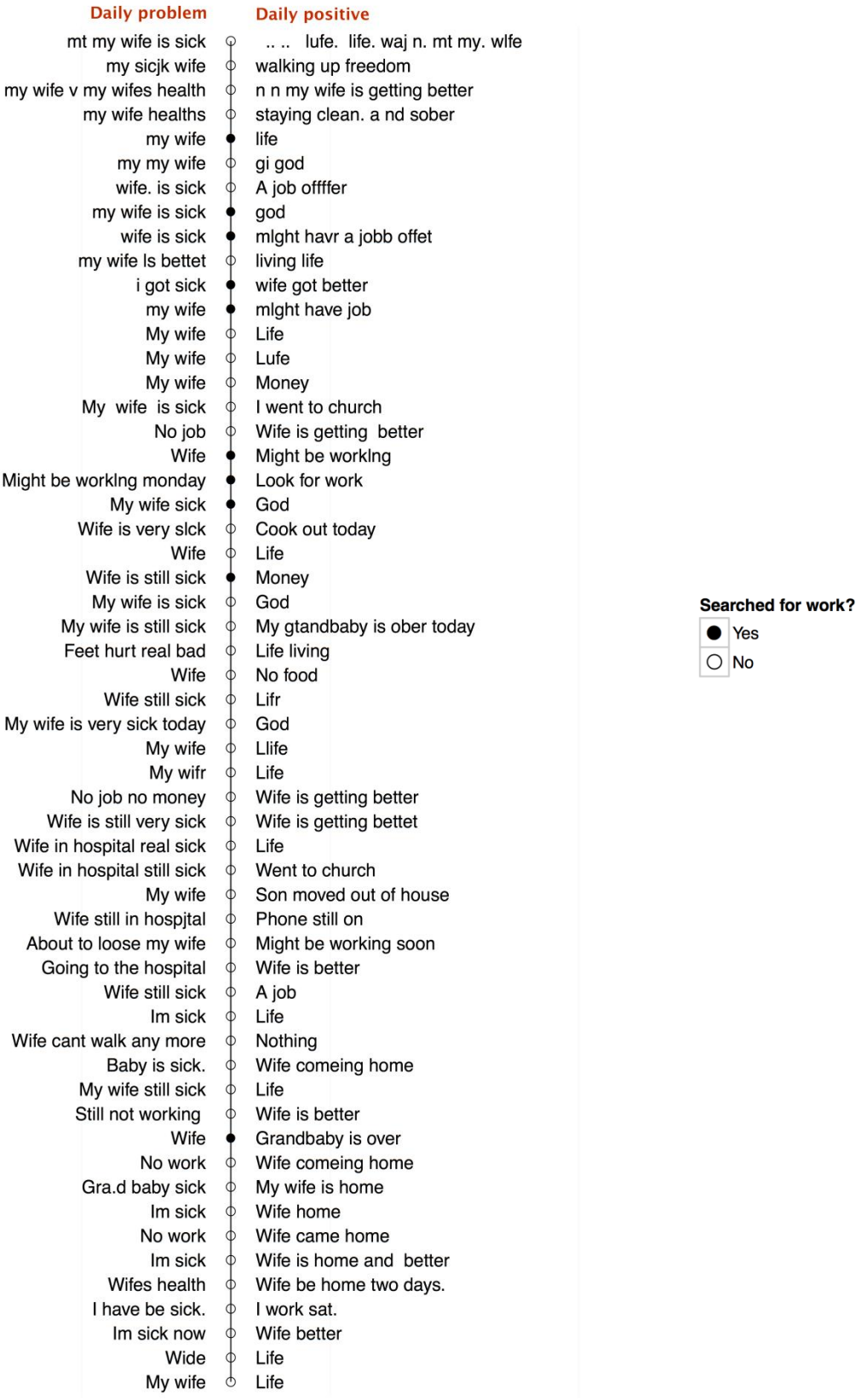
A third explanation for labor market nonparticipation is that non-searchers exit the market in order to engage in illicit work. Although I am unable to directly measure time spent on illicit activities, the answers to the random surveys indicate that non-searchers spend less time outside compared to searchers (0.15 compared to .24, p- value=0.04). They also spend comparable amounts of daytime hours as searchers relaxing or "hanging out" (15 percent among non-searchers compared to 17 percent among searchers). These measures, while not direct methods for determining illicit activities, suggest that non-searchers do not spend much time on the streets, at least during daytime hours.

In conclusion, non-searchers are mandated to attend day reporting programs at higher rates compared to searchers and some non-searchers enroll in school or other education programs. The proportion of time spent at the mandated programs is quite modest and school enrollment often occurs concurrently with job searching; it is unlikely that these factors explain labor market nonparticipation. Instead of program attendance, non-searchers spend the majority of their daytime hours at home, carrying out household chores and activities. For a small number of non-searchers, serious health and other personal issues explain their searching inactivity.

IV. DISCUSSION

The findings in this chapter describe a reentry period characterized by very high levels of instability, irregularity, and heterogeneity in job searching and working experiences. Although

Figure 2.7: Reentry experiences of a "non-searcher" whose wife had health issues



prior scholarship has found instability in post-release employment, the use of real-time, person-day measures reveals the high fraction of individuals who find very unstable, short-term, and poor quality jobs. Contrary to expectations based on human capital perspectives and economic models of job searching, the most disadvantaged jobseekers spend the greatest amounts of time searching for work. The individuals who find jobs relatively quickly and consistently work throughout the study period are not obviously more advantaged compared to the individuals who exit the labor market. One explanation for these findings is that the non-searchers perceive few benefits in the prospect of finding low paying and poor quality work. With the exception of those that face unexpected and challenging health issues, non-searchers may have chosen to exit the labor market to pursue alternative activities, whether returning to illegal means or providing in-kind resources and support to family and friends. In the short term, this cost-benefit decision may be logical; however, in the long term, these individuals miss out on important labor market experience during their prime working years (Apel and Sweeten 2010).

In contrast to these individuals, the most disadvantaged jobseekers—e.g., the searchers who have relatively low levels of social support, who are living in shelters, and who have high rates of mental health diagnoses—likely do not have alternative means to fall back on. They are stuck in unproductive searches for employment and do not experience success at finding long-term employment.

For many reasons, related not only to their conviction and incarceration but also to their pre-incarceration training and education levels, reentering individuals are unable to realistically compete with other low-skill workers and are relegated to a tier of especially poor quality and inconsistent work. This tier—below the so-called "bad jobs" that scholarship discusses (Kalleberg 2011)—consists of informal and formal market work and of both large firms and

small businesses, which typically do not care whether their workers have felony convictions. In some cases, employers actively recruit men with criminal records to fill positions that are physically demanding, are often unsafe, that require quotas that are unrealistic to sustain in the long term, and that offer meager wages. This tier of jobs, for which formerly incarcerated individuals compete, is so precarious and unstable that it merits recognition as a separate category, below the typical low-skill jobs that are routinely emphasized.

There are several limitations that must be considered in light of this chapter's contributions. First, some respondents (17 percent) had higher levels of missing data by person-day, making it difficult to place them in one of the three more substantially meaningful typologies. It is not clear whether the person-day information was missing at random, where participants simply did not hear the survey prompts, or if the data are missing systematically. If the data are missing at random, the low responders' mean time spent searching and working suggests that their trajectories appear most similar to the non-searchers who spent little time searching after the initial few weeks.

A second limitation is that the project covered the first three months after release from prison and it is possible that searching and working trajectories, as well as the type of work found, would change when considering a longer time frame. The lack of proper identification may have excluded participants from formal labor market opportunities; however this appears to be a minor issue. In the initial interview, participants were asked about their perceived advantages and disadvantages for job searching and obtaining work. Of the 131 individuals, only 11 participants (or 8 percent) stated that not having a driver's license or other identification would disadvantage them in their search for work. Another potential reason for changed trajectories after the first several months is the need to get readjusted after prison. In the initial

interview, 17 participants (or 13 percent) stated that they needed time to get settled and to reintegrate to life on the outside before commencing their job search. However, the prospectively collected smartphone survey answers suggest that the modal trajectory was not delaying search but instead, actively searching for the first few weeks and then curtailing search activities. Among the searchers, a longer time horizon would likely change the overall story of their search trajectories. It is unlikely that the searchers would be able to maintain the level and intensity of job search activities observed here over an extended timeframe. It is possible that eventually these individuals would find stable employment, but it could also be the case that they, too, eventually cease their search activities similar to the non-searchers.

Although these findings describe a profound degree of unstable and poor quality jobs obtained by reentering individuals, the potential bright side is that there is a window of opportunity for employment reentry providers to better support reentering individuals and to move them into jobs a tier above —low-skill and precarious but perhaps more stable work compared to their current opportunities. The findings indicate that many individuals are initially motivated to search for work but drop out fairly soon after release. If reentry employment providers can find ways to target this subgroup and promote a longer and more active job search, these individuals may find more success at finding employment. The typology findings also suggest that older and more disadvantaged individuals are very self-motivated to obtain work but have little success with searching on their own. These individuals may be the best candidates for transitional jobs programs, which provide temporary jobs for recently released individuals and help connect them to long-term employment opportunities.

On a broader structural level, this paper's findings substantiate the concerns of other scholars and policy makers about the lack of adequate employment opportunities offered by our

current economy (Kalleberg 2011). The jobs that can realistically be obtained by poor, low-skill minority men with criminal backgrounds are profoundly insufficient. They offer very little of the financial benefits, stability, or personal fulfillment that characterized jobs of past decades (Laub and Sampson 2003). Not only does this mean that finding work is likely not a protective factor for recidivism in today's context, but also that mass incarceration has created a class of poor, minority, and convicted men who are relegated to a particularly meager and dismal segment of the labor market. Considering that nearly 60 percent of black men without high school diplomas experience prison by their mid-thirties (Western 2006), the modal reality among low-skill black men is this lowest rung of the labor market.

Chapter 3. Going it alone? Social connectivity and finding work after prison

Finding work in the immediate months after release from prison is perceived critical for successful reintegration. Although scholarship identifies numerous barriers to employment at reentry, limitations of traditional research methods hamper our understanding about the impact of these obstacles on the actual experiences of reentering individuals. This paper utilizes novel, real-time observed behavioral and self-reported measures via smartphones to investigate the consequence of one theorized barrier to finding work: poor social connectivity. It analyzes whether reentering individuals have small networks and whether they use their contacts to find work. The project follows the daily experiences of 131 parolees, which were sampled from a complete census of releases in Newark, New Jersey. In contrast to existing perspectives, this paper finds that reentering individuals have large social networks and high expectations that their contacts will assist them with job searching. They also use their contacts to find work at comparable levels of other groups, and social contacts are positively associated with obtaining work. Utilizing several real-time self-reported and observed behavioral measures, this paper provides contemporary empirical evidence that low social connectivity is not a barrier to obtaining work after prison.

With the expansion of the criminal justice system over the past several decades, the number of individuals that are released from prison and reenter society have increased nearly five-fold (Carson and Golinelli 2012). Every day, approximately 1,800 individuals leave state and federal prisons and return to disadvantaged urban areas (Carson and Golinelli 2012; Sampson and Loeffler 2010). The ensuing weeks and months are a turbulent time, and two-thirds of individuals return to prison within the first three years after release (Langan and Levin 2002). To help protect against arrest and future re-incarceration, obtaining employment at reentry is perceived critical; however, individuals face substantial legal and non-legal barriers to finding work. These obstacles have been documented in reentry scholarship to varying degrees of success, with a particular focus on the negative consequences of legal restrictions and criminal record.

Low social capital is one theorized barrier to employment at reentry in which the empirical evidence is relatively limited. This is unfortunate, since the implications of few social contacts and ineffectual social networks are arguably the most consequential obstacles for jobseekers (Granovetter 1995). For individuals with criminal records, where the channels of job applications and walk-ins are less viable due to employer stigma, the lack of social contacts might be even more important. Although the implications of low social capital are dire for reentering individuals searching for work, it is unclear whether reentering individuals are actually socially isolated to the extent described in reentry scholarship. Recent research on the collateral consequences of imprisonment for families of previously incarcerated men suggests that individuals are more closely connected to their families than previous scholarship assumed (Geller et al. 2009; Turney and Wildeman 2013; Wildeman, Schnittker, and Turney 2012). In the present context of reentry, where the prevalence of incarceration among certain subgroups is

high, it seems unlikely that reentering individuals are the social isolates that are described in reentry accounts.

In this paper, I examine whether low social connectivity is in fact a barrier to employment among reentering individuals. Using real-time, observed behavioral and self-reported information from smartphones, I address three facets of social connectivity hypothesized to disadvantage individuals in their search for work: small social networks, hesitation to use contacts for information and referrals, and inability to translate job leads from contacts into actual employment. By taking advantage of new technologies for data collection, this paper contributes a novel, alternative perspective to theories on social connectivity, isolation, and employment barriers at reentry from prison.

In the next section, I briefly describe literature on low social connectivity and reentry from prison. I discuss the methodological difficulties that have hampered this research, and I propose that smartphones are able to address many of these limitations. In section II, I describe the sample—131 parolees sampled from a complete census of recent releases in Newark, New Jersey—and the project design, which includes an experimental intervention that aimed to expand the social networks of parolees. Section III describes the findings and section IV concludes with a discussion of conclusions, limitations, and future research.

I. BACKGROUND

Social Connectivity at Reentry

The prevailing notion in reentry scholarship is that reentering individuals have low levels of "social capital," or ties and networks that facilitate access to jobs and other resources, which result from their pre-prison circumstances as poor, low-skill urban residents and their incarceration and reentry experiences. The term social capital is commonly cited in this

literature; however, because social capital has multiple meanings among scholars (Portes 2000), I instead focus on three specific processes related to low social connectivity and finding work: a) small networks, b) hesitation to draw on contacts for job searching, and c) inability to translate contacts into employment. These three attributes of social connectivity together characterize a jobseeker's network as unhelpful for finding work (Fernandez and Fernandez-Mateo 2006), where individuals do not have the presence of ties for potential job referrals and do not receive helpful referrals, for whatever reason, from those contacts that do exist.

Small networks. Scholarship commonly describes the social networks of formerly incarcerated individuals as small and dominated by close contacts, which are the results of their experiences of offending, incarceration, and reentry. During their time in prison, individuals lose contact with their friends and family; this is particularly true for those with lengthy prison terms or for those with prison facilities located far from their original neighborhoods (Clear, Waring, and Scully 2005; Visher and Kachnowski 2007; Wolff and Draine 2004). Apart from the deterioration of established relationships, incarcerated individuals will have missed opportunities to create new contacts with non-institutionalized individuals, particularly during their formative, young adult years (Western 2006). Scholarship also proposes that individuals have fragile or tenuous relationships to begin with, perhaps a consequence of opportunistic or selfish behavior that is also related to their offending (Wolff and Draine 2004). Finally, reentering individuals may intentionally sever ties with people that they perceive to be bad influences. The end result of these different processes is a portrait of reentering individuals with small networks that are overrepresented by close friends and family, in the best of scenarios.

Individualistic orientation. Even if reentering individuals have social contacts, it is not necessarily the case that they would utilize them in their job search. Recent research on job

seeking among the urban poor suggests that individuals are hesitant to provide and receive help from others. Sandra Smith proposed the idea of "defensive individualism" to describe her findings of distrust and noncooperation among poor, black jobseekers (Smith 2010). Individuals were resistant to ask for help from their network and to provide referrals to their contacts, often due to uncertainties in following through with employment commitments or vouching for potentially unreliable applicants. These ideas relate well to the experiences of reentering individuals, who are often hesitant to ask for help because of their past transgressions (Wolff and Draine 2004), their current dependencies on already resource-constrained family members (Clear et al. 2005), or their instability due to parole requirements and their reentry situation.

The use of contacts to obtain work. Perhaps the most important factor regarding social connectivity and employment is whether the presence of social contacts is in fact consequential for finding work. The literature on reentry suggests that the social contacts of reentering individuals do not have the resources, information, or influence to be helpful (Western 2006). John Hagan proposed the concept of "criminal embeddedness," or the prevalence of social contacts engaged in criminal activity and the lack of connections to the labor market, to explain high unemployment rates (Hagan 1993). An ethnographic study of poor, minority, criminally engaged youth in New York City finds a similar explanation, where social contacts were unable to provide information and referrals about employment opportunities (Sullivan 1989). The geographic concentration of reentering individuals in neighborhoods with high rates of joblessness and disadvantage (Lynch and Sabol 2001) further suggests that individuals are isolated from job networks that characterize more advantaged locales (Wilson 1996, 2012).

The perception that reentering individuals have ineffectual social networks for finding employment is not specific to formerly incarcerated individuals. Rather, the reentry scholarship

oftentimes draws from broader literature on urban, minority, and poor residents more generally, finding that they are isolated from labor market opportunities (Wilson 1996, 2012). The idea of social isolation undergirds much of the literature on urban poverty and unemployment (Fernandez and Harris 1992; Kasintiz and Rosenberg 1996; Wilson 2012); however, recent scholarship suggests that residents may not be as uniformly isolated as originally suggested (Small 2004) and that they may not lack job contacts even if they ultimately find work through their own means (Mouw 2002). Notwithstanding these important exceptions, the prevailing notion is that low social connectivity disadvantages low-skill, urban, poor individuals more broadly and that these obstacles are exacerbated because of incarceration and reentry.

Limitations of scholarship on reentry, employment, and social contacts

Despite the widespread notion that reentering individuals have poor social connectivity, a close examination of the scholarship and the empirical evidence suggests that these concepts can be further interrogated with contemporary populations, broader samples, and more precise measures. Methodological difficulties hamper research within the individual topics of reentry, job searching, and social contacts. The research questions examined in this paper lie at the intersection of all three areas, resulting in particularly difficult methodological challenges.

Scholarship on the experiences of individuals after prison is quite limited. Despite the importance of understanding reentry trajectories, previous research has been hampered by the logistical difficulties and substantial costs of following a traditionally hard-to-access population during an unstable time period (Bushway et al. 2007). Because of these difficulties, research on reentry and employment typically utilize administrative records on unemployment insurance (Kling 2006; Lalonde and Cho 2008; Lyons and Pettit 2011). The few longitudinal survey studies of formerly incarcerated individuals contribute important information on reentry;

however, their findings are limited by relatively low participation rates and completion rates of about 40 to 55 percent (Nelson et al. 1999; Visher and Kachnowski 2007).

As important, reentry survey studies face methodological difficulties concerning job search activities and social contacts that challenge other scholarship on these topics. The use of social contacts for finding work has been extensively analyzed from a variety of approaches, among many subpopulations, and from different disciplinary perspectives (Brown and Konrad 2001; Elliott 1999; Fernandez and Fernandez-Mateo 2006; Granovetter 1995; Mouw 2003). However, research on job searching confronts methodological difficulties with retrospective measures and biases concerning basic estimates of the amount of time looking for work (Torelli and Trivellato 1993). These concerns have stimulated recent research that collects high-frequency, longitudinal, and prospective data on job searching (Krueger and Mueller 2011; Wanberg, Zhu, and Van Hooft 2010). These studies sample from unemployment insurance recipients, which provides broad samples but often excludes individuals that are working on the fringes of the labor market, such as reentering individuals (Pettit 2012). Moreover, they are limited by low participation and retention rates over time.

Similar to the methodological difficulties with studying job searching, empirical research on social contacts and networks confronts steep challenges. Most studies rely on survey questions or other self-reported methods to estimate network size (Marsden 1990). However, respondent assessments are poor reflections of observed social interaction (Bernard et al. 1984), and the common strategy of using a name-generator method to measure size and characteristics of networks is biased by several types of error (Feld and Carter 2002; Marin 2004; Marsden 2003). In addition, name-generator methods typically focus on strong ties (for an exception, see McCormick, Salganik, and Zheng 2010), which are less consequential for connecting jobseekers

to employment (Granovetter 1973). These estimation strategies produce relatively coarse measures of social network size, which often do not capture characteristics, timing, or duration of relationships. Because reentering individuals may consciously limit their interactions or lose contact with friends and family after prison, overall network size is a particularly poor measure to assess the social network characteristics that are specific to reentry.

The limitations of self-reported social contact measures may also be especially relevant to poor, minority individuals such as formerly incarcerated men. Recent ethnographic research finds that low-income, minority populations oftentimes describe themselves in ways that suggest limited social interaction, as a way to psychologically distance themselves from the problems of others, even when their observed behaviors suggest frequent, intimate, and important interactions (Murphy 2012). The confluence of these many methodological difficulties has limited the available empirical evidence on poor social connectivity as a barrier to finding work at reentry.

Smartphones as data collection tools

In order to address many of the methodological limitations of prior scholarship, I use novel measures of real-time self-reported answers and observed behaviors on social contacts, job search activities, and employment that are collected from smartphones. The advantages of smartphones for data collection among the social sciences are only recently documented (Raento et al. 2009), and the author knows of no previous studies that uses smartphones to study hard-to-reach populations. However, smartphone research designs can substantially improve participation and retention rates among highly mobile, resource-constrained individuals (see Chapter 5).

An important strength of smartphones is the ability to install applications that can send survey questions to participants in their everyday environments. This allows for the real-time

collection of measures that are irregular or retrospectively hard to assess, such as job searching activities or temporary employment (Torelli and Trivellato 1993). Through the collection of call and text logs, researchers can study observed social interactions through the phone (Raento et al. 2009), providing a behavior-based estimate of social network size. Researchers can automatically send surveys after phone calls and texts in order to ask questions about specific interactions that just occurred, providing additional information on characteristics of social contacts. To assess social interactions that occur in-person, as opposed to over the phone, researchers can send surveys at randomly sampled time points that ask about current activities and social interactions. This follows an experience-sampling methodology, where time periods are randomly selected to study temporal events in real time (Stone et al. 2007).

Although smartphones are primarily viewed as data collection tools in the social sciences, they can also serve as platforms for experimental designs. Smartphone applications and text messaging services are already being used as interventions in the private marketplace, for promoting weight loss (e.g., Lose It!, Diet Assistant, BMI Calculator), smoking cessation (e.g., smokefreetxt), and prenatal health (e.g., text4baby). Smartphones can have a similar function in the social sciences, as potentially important experimental interventions for testing sociological questions. In this paper, I use a group-based text messaging application (https://groupme.com) to expand the social networks of participants, by connecting half of participants to others in a peer-based job forum.

II. DATA, MEASURES, AND METHODS

This chapter analyzes data from the smartphone participants of the Newark Smartphone Reentry Project (NSRP). Half of the participants were assigned to an experimental treatment—a peer-based text-messaging forum for job leads. The other half of participants received the same

job information but through individual text messages. In this chapter, I restrict the analysis sample to the 131 individuals that sent information via smartphones on the variety of measures considered below. I exclude four individuals with high levels of missing survey data.[6]

Data

The data used in this paper come from several sources. Through the smartphones, participants received three different types of surveys:

Daily survey. Participants received a survey daily at 7pm, which asked about job searching and employment experiences for that day.

Experience sampling survey. Participants received a survey at a random time each day, which was sent between the daytime hours of 9am and 6pm. The purpose of the experience sampling survey was to randomly sample daytime activities and time spent with others.

Phone call survey. Participants received a short survey after a call or text message was received from a new, unique phone number. When the phone call referred to a person, as opposed to a business, participants were asked about the characteristics of the contact, such as whether the contact is employed and how close the respondent feels towards the contact. This enabled the real-time collection of information on a social interaction that had just occurred. [7]

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[6] Four individuals completed smartphone surveys on two or fewer days. One of these individuals was unable to complete any smartphone surveys because he felt uncomfortable responding to the survey prompts. He was older (58 years old) and reported serious mental health issues.

[7] The survey completion rate for the phone call surveys is slightly higher compared to other smartphone surveys (80 percent compared to 78 percent). The skip pattern of the survey questions allowed participants to select an individual named in the initial survey or describe a new contact. While the majority of completed surveys contain information on a new contact, nearly half of respondents attribute a significant percentage of their surveys (about one-third, on average) to an initially listed individual. Some of this duplication is likely due to individuals using several different phone numbers to call a participant, since phone sharing among low-income individuals may be common; however, it is also likely that participants name initially listed individuals to skip out of the modestly longer pattern of survey questions for a new contact. If this is the case and if initially listed individuals are relatively more advantaged

Apart from smartphone surveys, data were collected through these other sources:

Encrypted phone numbers. The smartphone application passively collected encrypted phone numbers for all phone calls and text messages. Encrypting the phone numbers preserved the privacy of participants' contacts, while allowing researchers to distinguish new, unique phone numbers, as well as the frequency and duration of phone interactions over the study period. I consider phone numbers from reciprocal phone calls, meaning that the participant both made and received a completed call from the phone number. This follows prior literature (Miritello, Moro, et al. 2013; Onnela et al. 2007) and excludes phone numbers that may not represent salient social contacts, such as wrong numbers, business calls, or telemarketers. Although restricting numbers to reciprocal calls filters out one-way contacts, phone calls to and from potential employers are included in the count of the respondent's social network. In this case, the inclusion of these types of contacts positively biases the association between employment and social network size.

In addition to phone call logs, I examine measures derived from text-messaging communications as robustness checks.

Conversation transcript from peer-based job forum. I collected the complete transcript of all communication that occurred among participants who were connected in the peer-based job forum. As described above and in the following section, the peer-based forum was an experimental intervention and participants connected to this forum sent text messages to others in the group about job openings and their experiences searching and working.

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compared to contacts encountered during the study, the estimates of contact characteristics may be biased upward. Participants may therefore appear to be connected to relatively more advantaged contacts compared to their actual contacts.

Semi-structured interview information. Interviews were conducted with all participants at the beginning and at the conclusion of the study. The initial interview gathered information on demographic and background information, as well as participant expectations for their job search and employment over the next three months. The exit interview asked participants to confirm information collected over the past three months and to discuss their experiences participating in the project.

Administrative records on criminal justice history. Criminal justice information was gathered through criminal history administrative records, provided by the New Jersey Parole Board. These records describe arrests, convictions, and incarcerations that occurred in New Jersey. This information complements self-reported information, which was gathered in the interviews.

As the above describes, this project is uniquely able to utilize information collected from several self-reported, behavior-based, and administrative sources to examine the social connectivity of reentering individuals in their search for employment. It combines information collected from more traditional methods (interviews) with measures collected from novel methods (smartphones), in order to describe real-time, self-reported work experiences and social interactions from smartphone surveys as well as observed social communications via phone call logs. The strength of these approaches is also a potential limitation, as research is unclear about how findings might be affected by the provision of phones and the collection of information through phones. Although this is a new methodology that has yet to be thoroughly vetted, a comparison of outcomes between these participants and a control group of individuals followed by interviews every other week suggests that the phone did not impact employment outcomes or

the use of networking for finding employment, which are the main outcomes under consideration in this paper.

Analytic methods

To answer the first two questions—whether parolees have small networks and are hesitant to use their contacts—I utilize the data sources described above with a descriptive analysis. Where possible, I compare the estimates for parolees with those of general population samples to assess the relative level of social connectivity. While these other samples are very different from the NSRP sample, they provide a useful point of reference for novel measures that would otherwise have no comparison.

For the third question—do contacts matter for finding work—I utilize a survival analysis model for estimating time to first job. I estimate a Cox proportional hazards regression model to examine the association between social contact covariate measures and days until first day of employment.[8] The Cox model is a continuous time survival model that uses a partial likelihood method to estimate associations between covariates and a baseline hazard to the outcome variable, which in this case is employment (Cox 1975; Singer and Willett 2003). It is a nonparametric approach, which does not require researchers to make a priori modeling assumptions about the data (Singer and Willett 2003). In order to handle "ties," or outcomes that occur at the same time, I use the "exact method," which is the preferred method when computationally feasible (Singer and Willett 2003). To determine the appropriate regression

[8] These models consider only one way of leaving the "at-risk" state for employment—finding work. However, individuals may have left the project due to recidivism back to jail or prison. An analysis of criminal justice records shows that four of the 131 participants (3 percent) left the project because of recidivism. Because of the low prevalence of recidivating during the study period, I decided that a more conventional single-decrement approach is preferable.

model, as well as the form of included covariates, I employed several regression diagnostics.[9] Based on the literature on the importance of social contact measures for finding employment, I expect that larger social networks and more advantaged contacts will be associated with a shorter duration of unemployment at reentry.

The use of high frequency, longitudinal data contributes a novel and detailed understanding of the oftentimes chaotic reentry period. These data provide fine-grained, person-day information, which is a major strength; however, at the same time, the prevalence of missing values on key outcomes must be addressed (Walls and Schafer 2005). In the analytic sample, 19 percent of person-days are missing survey information, meaning that these observations are missing information on the key outcome of being employed. In Cox regression models, the actual event time of the outcome (or first day of work) is not important. Rather, it is the rank order of when individuals experience the outcome, or when they are censored, that is consequential (Singer and Willett 2003). Therefore, missing data are a concern if they change the order of the outcomes. In this paper, I present results from a complete-case approach, which excludes observations with missing values. In other analyses, I aggregate observations to the person-week as a robustness test of sensitivity to the person-day format. I describe these results within the text and they are reported in the Appendix.

To further investigate whether contacts are consequential for finding work, I examine several outcomes by experimental group. The experimental treatment was assignment to a peer-based text-messaging forum for job leads, which aimed to expand participants' social networks by connecting them to other jobseeking participants. Within the forum, participants received

[9] These include analyzing the Martingale residuals for covariate forms, the deviance residuals for identifying outlying individuals, the Schoenfeld residuals for testing the proportionality assumption, and the score residuals for ensuring that no particular individual is overly dominant in model estimates (Singer and Willett 2003).

daily text messages about job postings from me, Monday through Thursday. Because they were connected through a group text-messaging application, they could reply to my texts, send their own job information, provide updates on their job search, and motivate others in their search for work. Texts by participants to the rest of the group averaged 1.24 per day; however, their texts usually occurred in sporadic bursts of discussion. The control group received the same job information from me but through individual text messages.

To understand the effects of the experimental treatment, I look at differences in outcomes between the experimental and control groups. Because the experimental design was a text-based intervention, I also am able to analyze the content of the text messages from participants in order to more thoroughly assess the role of the peer-based job forum. Although the small treatment (n=65) and control (n=66) group sizes limit the statistical significance of many of the outcome measures, this analysis provides suggestive evidence of the causal effect of connecting individuals to a peer forum for job searching and employment.

III. RESULTS

I first describe the characteristics of the sample (see Table 3.1). Among all participants, the average number of unique social contacts that participants communicate with over the phone is 41. Based on answers from the phone call surveys, participants describe their contacts as relatively advantaged, with a high proportion of contacts currently employed (70 percent). Participants also describe themselves as close to contacts, with the average level of closeness of 72 on a 100-point scale.

Do reentering individuals have small social networks?

Figure 3.1 displays four different measures of contact and communication, based on the phone call logs over the study period. The "number of contacts per person" refers to the average

Table 3.1: Characteristics of the sample, n=131

	Mean/%	SD
Social contact measures		
Number of contacts	40.92	(31.65)
Proportion of contacts employed	0.70	(0.22)
Mean closeness of contacts: 0 to 100	71.76	(18.14)
Demographic and other characteristics		
Social support scale: 0 to 5	4.01	(1.18)
Age: yrs	35.80	(10.07)
Black	90.84	
Education		
Less than HS	28.24	
HS graduate/GED	45.80	
Some college	23.66	
College	2.29	
Relationship status		
Single	48.09	
Partner	46.56	
Married	5.34	
Total children	1.55	(1.47)
Self-reported health (1 excellent to 5 poor)	2.24	(1.16)
Mental health diagnosis	9.16	
Living in a shelter	15.27	
Length of recent incarceration: yrs	4.22	(3.72)
Pre-incarceration factors		
Age at first incarceration: yrs	24.10	(6.58)
Any formal labor market job	78.63	
Any felony conviction	77.86	
Number of convictions	6.01	(4.16)
Number of incarcerations	0.98	(1.19)
N	131	

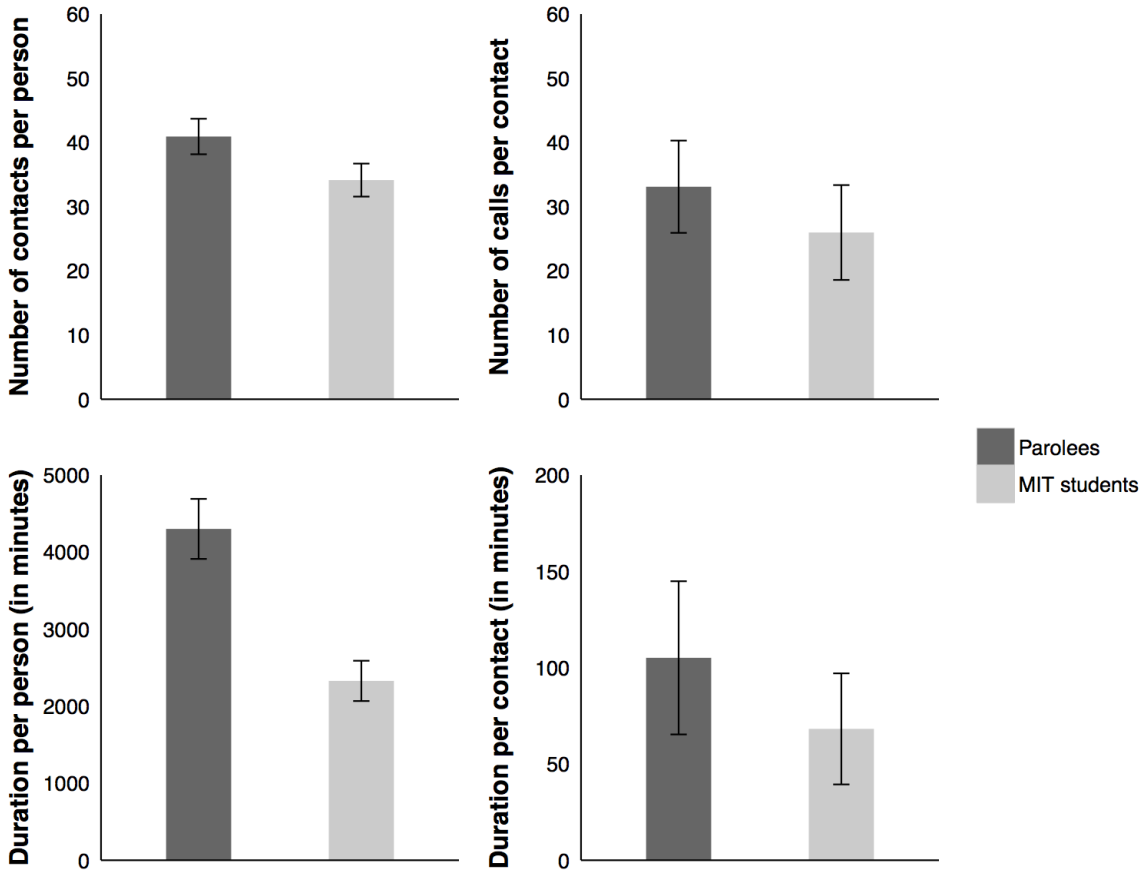
Notes : social contact measures come from the smartphone-based phone logs and phone surveys. Demographic and other characteristics are measured in the initial interview. Pre-incarceration characteristics come from administrative records and the initial interview.

number of unique, reciprocal contacts per participant. The "number of calls per contact" measures the number of completed phone calls per each unique, reciprocal contact. Participants made 33 calls per each phone number, on average, over the study period. The "duration per person" refers to the total time (in minutes) spent by the average participant on phone calls. Parole participants spent a large amount of time on the phone—4,301 minutes (or nearly 72 hours) over the study period. The "duration per contact" measures the amount of time (in minutes) spent by the average participant talking to each contact; participants spent 105 minutes talking to each contact over the study period.

Because these measures are based on phone call logs and are quite new, it is difficult to know how these estimates compare to the number of contacts and level of communication among the general population. There is one complete call log data set for the United States that allows us some comparability. This study followed university students, faculty and staff from the Massachusetts Institute of Technology (MIT) over a similar time frame.[10] Across the different measures of contacts and communications, the parole participants were in contact with more individuals and had more communication with each contact. The levels of contact and communication among the parole sample are also higher on measures that consider text messages, as opposed to the phone call logs. Clearly, MIT students, faculty, and staff are very different from the parole sample across a variety of measures and contexts; however, these comparisons provide an approximate benchmark of contacts and communication among the general population and suggest that parolees do not have obviously smaller social networks or fewer phone interactions compared to more advantaged samples.

[10] The MIT study, or the Reality Mining project, followed participants for five months, which is a longer time frame than this study. However, the data suffers from a 15 percent known data loss. The slightly longer study period means that the MIT estimates are biased upwards and the differences between the parole participants and MIT sample are likely larger.

Figure 3.1: Phone-based contact, parolees (n=131) and MIT students (n=89)



Notes: estimates among parolees and MIT students, faculty and staff are based on phone call logs. Data for the MIT sample comes from the Reality Mining project (Eagle, Pentland, and Lazer 2009). Error bars reflect mean proportion of time +/- standard error of the mean.

Apart from communication over the phone, in-person social contact was measured through the experience sampling smartphone survey. As described in the previous section, the experience sampling survey was sent to participants' phones at a random time between 9am and 6pm daily. Based on participants' responses to these surveys in real time, participants were alone 55 percent of daytime hours. They were with friends or family 38 percent of the time and

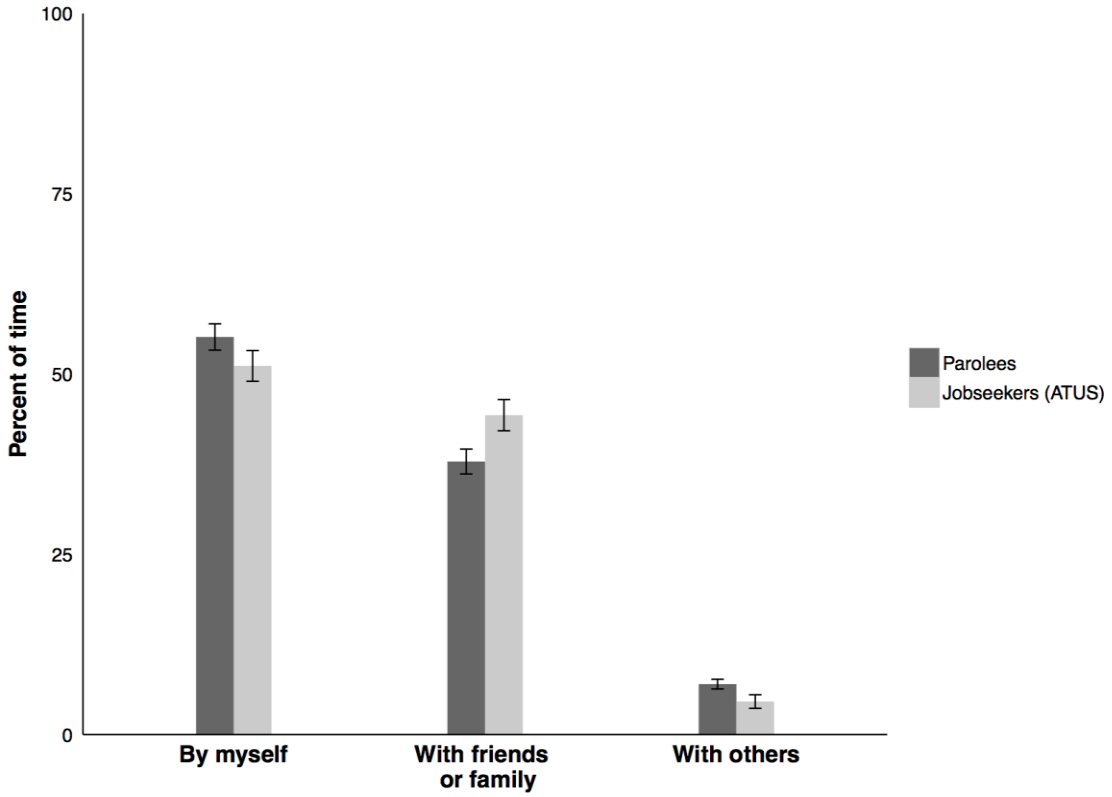
with others (e.g., strangers) seven percent of the time (see Figure 3.2).[11] Although parolees spent the majority of their time alone, these estimates are similar to in-person contact among the general population of unemployed jobseekers. To calculate estimates of time spent alone, with friends and family, and with others among the general population, I analyzed the 2012 American Time Use Survey (ATUS), which asks respondents about their activities for the prior day. I limited the ATUS sample to individuals who were unemployed and searching for work. While the ATUS respondents spend a slightly higher percentage of time with friends and family, as opposed to others, they do not spend significantly different percentages of time alone during the day (see Figure 3.2).

Are reentering individuals hesitant to use their contacts for job search?

At the initial interview, participants were asked to name up to four people that they think will help them with their job search over the next three months. Contrary to findings of prior scholarship, which suggests that low-income, black jobseekers are hesitant to receive help from others, participants named an average of 3.7 contacts. The majority of participants (or 76 percent) named the maximum number of four individuals. When asked how these individuals would assist with their job search, participants described the provision of social support and money for transportation and clothing for job searching, as well as information and referrals for job openings. Although social support and motivation are likely as important as information and referrals, the latter are typically considered in social network studies of employment (Granovetter 1995). Focusing on those contacts that are expected to provide information and referrals only, participants named an average of 3.0 contacts (see Figure 3.3).

[11] This analysis considers a sample of 129 participants, which excludes two participants who did not complete experience sampling surveys during the study period.

Figure 3.2: In-person social contact during daytime hours, 9am to 6pm, n=129

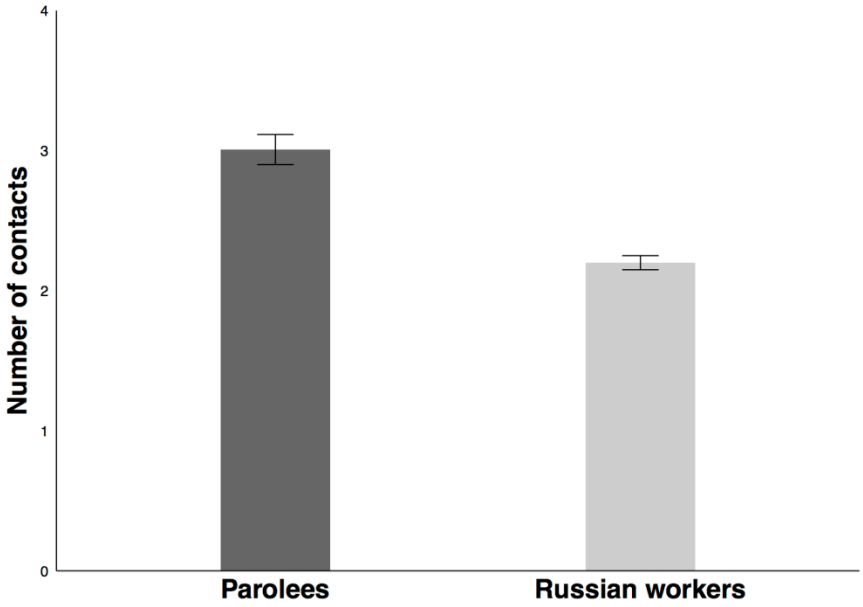


Notes: sample excludes two participants who did not complete experience sampling surveys for the study period. Estimates among parolees are based on survey answers solicited at randomly-sampled time periods. Estimates among male jobseekers are based on answers about activities and time spent with others for the prior day from the American Time Use Survey (ATUS). Error bars reflect mean proportion of time +/- standard error of the mean.

The interview questions about the number of contacts that could potentially assist with job searching follows the format of prior research that analyzed the use of contacts to find employment among a sample of employed Russian workers (Yakubovich 2005). Comparing the answers of parolees to the Russian workers, parolees stated that they expected assistance from more contacts (3.0 compared to 2.2 contacts). As with the MIT comparison, the studies and samples are different in several ways;[12] however, the comparison provides suggestive evidence

[12] There are several differences between the Russian sample and the parolee sample. Mainly, the Russian sample considered a group of individuals who had already gained employment, which

Figure 3.3: Number of contacts expected to help with job searching, among parolees and Russian workers



Notes: estimates among parolees are based on answers provided at the initial interview. Estimates among Russian workers comes from (Yakubovich 2005). Error bars reflect mean proportion of time +/- standard error of the mean.

that the extent of help parolees believe they will receive from others is comparable to other, arguably more advantaged jobseekers.

The importance of social contacts for employment

The results presented above find that parolees have large phone call networks, spend an average amount of time alone, and have relatively high expectations that their social contacts will assist them with their job search. In these aspects, their degree of social connectivity appears to be similar, if not higher, compared to other populations. However, the presence of

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implies an advantaged sample that may be inclined to name more contacts. The Russian study also administered the questions regarding contacts retrospectively, suggesting that respondents may not have considered the full range of their contacts that could have provided assistance, which would suggest a smaller number of contacts. Although it is unclear whether these differences would bias the estimates in one direction or the other (or balance out), these are important caveats when comparing the estimates.

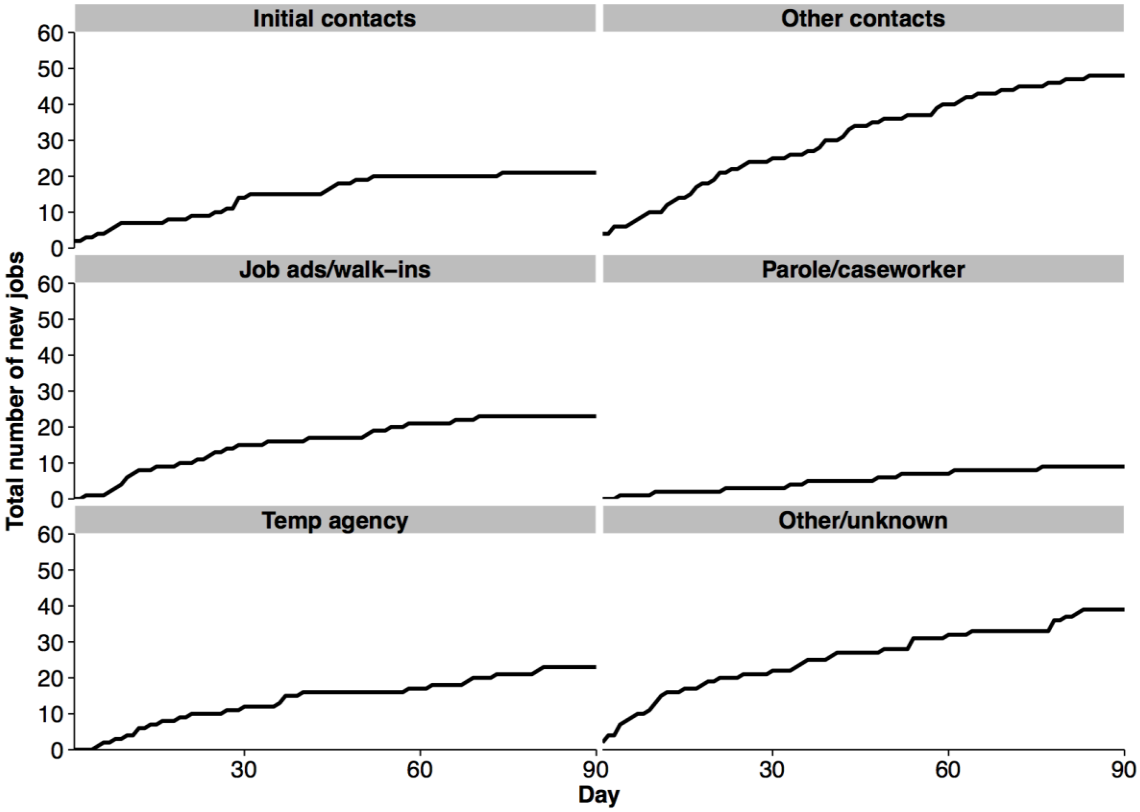
social contacts and the willingness to reach out to contacts do not necessarily mean that contacts can be leveraged effectively to obtain employment.

Figure 3.4 describes the sources for all new jobs reported over the study period. Across these jobs, 41 percent came from a social contact, either from a contact named in the initial interview or from another contact. This estimate is similar to Granovetter's original finding, where 46 percent of his unemployed jobseekers found jobs through social contacts (Granovetter 1995). Other jobs came from a job advertisement or by approaching a potential place of employment and inquiring whether they are hiring (14 percent). Temporary agencies were also important sources for new jobs, and another 14 percent came from these agencies. It is important to note that parole officers and caseworkers were not common sources for new jobs, with only 5 percent of jobs coming from these intermediaries. Although scholarship suggests that intermediaries can improve employment outcomes among disadvantaged jobseekers (Fernandez 2010), it appears that few jobs are currently found through these channels.

As the above results show, social contacts play an important role in connecting parolees to jobs at reentry. Even among parolees who found jobs that did not result from a social contact, it is likely that parolees with larger social networks and more advantaged contacts are better positioned to find work. Because a jobseeker does not necessarily have only one job prospect, but instead, might choose among various options, the actual employment outcome may not reflect the full advantages that social contacts contribute throughout the job search process (Mouw 2003).

In order to examine this thesis directly, I estimate the association between social contacts and employment using survival analysis models. Table 3.2 describes the results of two Cox regression models—the first model (column A) estimates the hazard to employment using time-

Figure 3.4: Source of new jobs, n=168



Notes: initial contacts refer to contacts that respondents named in the initial interview. These measures are based on the real-time collection of information on all new jobs (n=168) reported over the study period by 131 individuals.

stable covariates, drawn from the initial interview and from criminal justice administrative records. The second model (column B) estimates the hazard with the inclusion of time-varying measures of social contacts collected from phone logs ("average number of new contacts" per day) and phone surveys ("proportion employed" and "closeness"). As Table 3.2 shows, the average number of contacts added daily is positively associated with time to employment. The hazard ratio of 1.49 indicates that the hazard of employment is 49 percent higher with each additional new phone contact per day.[13] Interestingly, the proportion of contacts employed and

[13] The hazard ratio is converted to a percentage difference in hazard associated with a one-unit difference in the covariate with the following formula: 100*(Exp(coef)-1)

the mean closeness of contacts are both negatively associated with the hazard, suggesting that individuals with a greater proportion of employed contacts and with more close contacts are unemployed for longer.

In other specifications of the model, which are presented in the Appendix 3.1, I estimate the hazard to finding work at the person-week level instead of the person-day level, the hazard to finding work in the formal labor market, and the hazard to finding work when the hourly wage is higher than the minimum wage of $7.25 per hour. In all of these models, the average number of new contacts is positively associated with the hazard to employment, which aligns with the results for the main model that considers any type of work. For formal labor market work, however, the association is not significantly related. Perceived closeness of contacts is also negatively associated in the other models. One difference is that the proportion of contacts employed is not related to the hazard, when the outcome is better quality employment (i.e., formal labor market work or higher wages). Overall, the findings regarding the size and closeness of contacts suggest that large social networks are important for finding work; however, close contacts (or "strong" ties) are negatively associated with the hazard to employment. These results align with the well-established concept that "weak" ties or acquaintances are most consequential for finding employment (Granovetter 1973).

Other variables are importantly associated with the hazard to employment. A participant's number of children is positively associated with the hazard, where the hazard is 21 percent higher with each additional child. These associations are not significantly associated in the models that consider higher quality employment. These findings suggest that individuals with children are more likely to find employment quickly, but that they are no more likely to find better quality jobs. Interestingly, formal labor market experience prior to incarceration is

Table 3.2: Cox regression model estimating the hazard to first day of employment, n=131

	Model A: time-stable				Model B: Full model			
	Coef	Exp(coef)	se(coef)		Coef	Exp(coef)	se(coef)	
Average number of new contacts					0.40	1.49	(0.10)	***
Proportion of contacts employed					-1.33	0.26	(0.55)	*
Mean closeness of contacts					-2.33	0.10	(0.58)	***
Social support scale	-0.20	0.82	(0.12)		-0.03	0.97	(0.12)	
Age	0.00	1.00	(0.02)		0.00	1.00	(0.02)	
Black	0.47	1.60	(0.45)		0.27	1.31	(0.45)	
Education (less than high school)								
HS graduate/GED	-0.09	0.91	(0.29)		0.05	1.05	(0.30)	
Some college	0.57	1.76	(0.37)		0.99	2.69	(0.37)	**
College	-0.99	0.37	(1.14)		-1.69	0.18	(1.15)	
Relationship status (single)								
Married	0.22	1.25	(0.72)		1.20	3.31	(0.63)	
Partner	-0.61	0.54	(0.27)	*	-0.27	0.77	(0.26)	
Total children	0.06	1.06	(0.09)		0.19	1.21	(0.09)	*
Self-reported health	0.21	1.24	(0.12)		0.18	1.20	(0.12)	
Mental health diagnosis	-0.71	0.49	(0.47)		-0.42	0.66	(0.44)	
Living in a shelter	-0.15	0.86	(0.34)		-0.24	0.78	(0.37)	
Length of recent incarceration	-0.02	0.98	(0.04)		0.02	1.02	(0.04)	
Age at first incarceration	-0.04	0.96	(0.02)		-0.02	0.98	(0.02)	
Any formal labor market job	-0.69	0.50	(0.32)	*	-0.79	0.45	(0.32)	*
Any felony conviction	-0.04	0.96	(0.35)		0.08	1.08	(0.35)	
Number of convictions	0.17	1.19	(0.05)	***	0.07	1.08	(0.06)	
Number of incarcerations	-0.55	0.58	(0.18)	**	-0.33	0.72	(0.19)	
Person-days (N)		3421				3421		

*p<0.05, **p<0.01, ***p<0.001

Notes: the coefficient estimates describe the effect of a one-unit difference in the covariate on the log hazard. The middle columns report the antilog of each coefficient, which are commonly referred to as hazard ratios. The third columns describe the standard error of the coefficient.

negatively related to the hazard in all the models, including those that consider higher quality employment. The estimated hazard function for individuals who have previous experience in the formal labor market is 45 percent lower compared to individuals without that experience.

The causal effect of expanding social network size

In the final analysis section, I present results from the experimental treatment, which connected half of the participants in a peer-based, text-messaging forum for job leads. At any one time, the size of the forum ranged from approximately 15 to 20 individuals. Participants in this forum received daily text messages about job openings from the researcher, and they could use the forum to send their own messages. Participants in the group were anonymous and were told to use the forum for job searching purposes. The participants in the control group received the same daily job information from the researcher but through individual text messages.

Participants used the peer forum primarily to share information about jobs, to motivate others to apply for jobs or go to job fairs, and to provide social support for job searching and reentry difficulties more generally.

Information sharing. Participants periodically shared information about job openings, usually about large firms or temporary agencies that were hiring for several positions. For example, this participant offered information on a large food distributor that was hiring in the area:

Yo wakefern hireing go down in the neck go to riverview court but keep goin past it to the first block on your right albert st make right then make right at the end of that block then make a left on to ueclid & the ware house is on the left go to the front securty to get the application.

These were warehouse jobs, which were usually considered the most desirable positions. Even though the work was physically demanding and employees were paid the minimum wage of $7.25 per hour, the work was usually full-time with a set schedule.

Another participant shared information about a temp agency that was hiring. This participant had been working for the agency for the past several weeks as a construction and transportation helper, which usually involved placing cones on streets and directing traffic. He

received minimum wage and relatively steady hours. In this conversation, two other participants responded with their own questions or comments about the employer.

P1: I'm working for labor ready. Some of the jobs start at 7.25to$10.00. Its on 186 west market street.

P2: Do u hav 2 b certified

P1: No. If you got those certification it's. A plus but what I seen you gotta take a test then you gotta got thru their safety training test. They try there best to get people work.

P3: They wouldn't except my id

P1: You need your id and socialsecurity card

Motivation to act. Some participants encouraged others to act on the shared information. This often took the form of short exchanges between participants, for example:

P1: check out dot com in edison[14]

P2: Will do!

Participants also motivated others to act when opportunities were time sensitive. For example, in the aftermath of Hurricane Sandy, several hundred manual laborers were needed in order to assist with clean-up efforts: *Every one get a chance to go to the airport. Today between. 10am - 2pm for sandy job's. Clean up.*

Job fairs were also commonly held in the Newark area and participants urged others to attend. In this conversation, a participant followed up about a job fair that I had posted information about earlier in the day.

P1: What's good? How many of you are going to the job fair?

P2: I would like to go but unfortunately its short notice. i'm in a program right now.

[14] Dot Com Distribution is a warehouse that contracts with e-commerce sites to package and ship products purchased online.

P1: It's from 1to4 so you might be able to make it after. It will be a good form of networking.

P3: Where is it?

P1: essex county college main gym

P3: Ill be there

Social support for job searching and reentry. Perhaps the most important function of the peer group was to provide general support and encouragement for job searching and for the reentry transition from prison to home. Participants would often post small updates about their job search activities, such as plans to submit a job application. Others would respond with words of encouragement or advice. For example, in response to one participant who stated that he planned to apply for a warehouse position, another wrote: *make sure you can pass drug test with select a job go for it.* Participants also shared disappointing news or frustrations with their job search. In one case, a participant followed up on a roofing job that I had posted earlier that day. Another participant immediately responded with words of support and motivation:

P1: Not enough experience for chuck roofing job

P2: BUT DON'T ALLOW THAT TO KEEP YOU FROM STRIVING KEEP YOUR HEAD UP REACH FOR GRATENESS I'TS WITHIN OUR GRASP.

In another situation, a participant simply wrote that he was discouraged. Two other respondents agreed but then encouraged the first participant to keep searching.

P1: This job search stuff is depressing

P2: Absolutely. When the$ coming n! Not

P3: Ur absolutely right because I've seen and heard it 2 :-)

P1: How long does it take on average to find a job

P2: no way of saying

P3: It depends on you u and how determined u r don't give up keep on looking

P2: Absolutely. Correct

Participants not only provided information and updates related to their job search, but they also sent text messages about more general reentry concerns and issues related to coming home. Participants provided updates on obtaining driver's licenses, acquiring relevant identification cards, and resolving old warrants and pending charges from before their incarceration. For example, one morning a participant sent a text message, *Got court today.* Later in the day, he followed up:

P1: Court went well, everything dropped but careless driving. Maybe Fort Lee isn't so bad after all.

P2: Glad 2 hear that

P3: Happy for u

P1: Thnx

Participants also used the forum to express gratitude for being back home. As a group of individuals who all share the same situation of recent reentry from prison, even holiday greetings reinforced this common experience. This conversation occurred after the Thanksgiving holiday:

P1: Hope everyone had a good holiday

P2: Yes, it was great.the food was wonderful.

P3: Yes the food was excellent!

P4: The holiday was great being that it was my first one

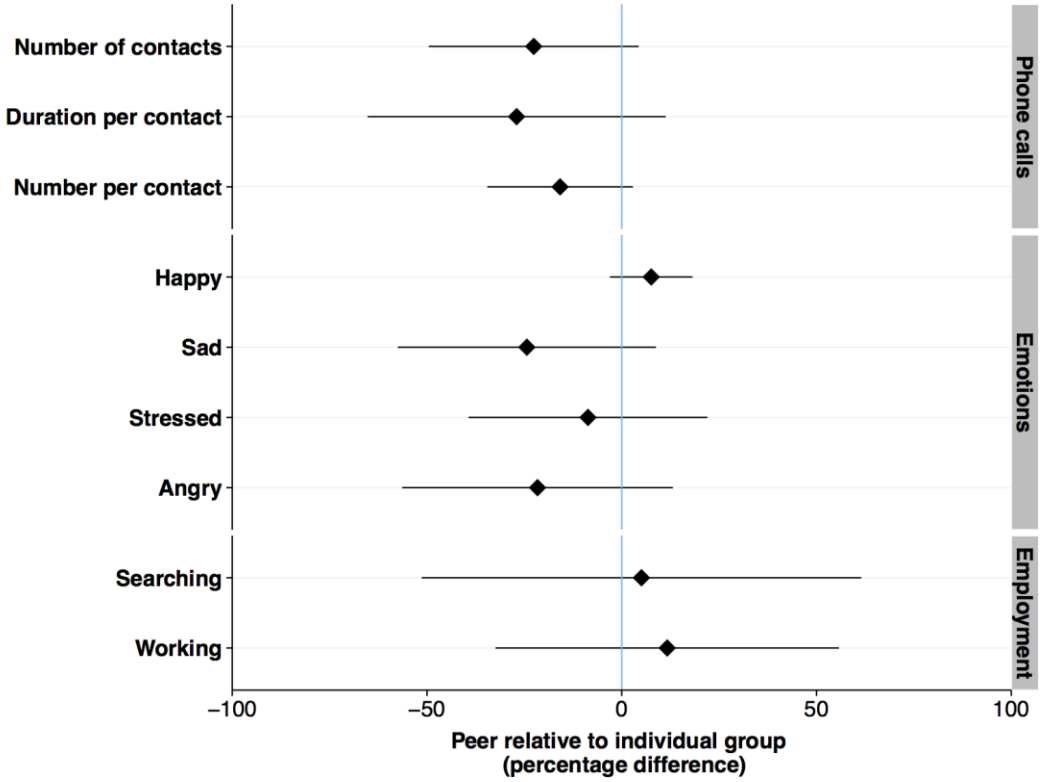
P2: The first of many my friend.

The peer-based forum provided participants with an online community of other recently released parolees who were searching for work. The forum provided jobseekers with information on job openings and potential employers, motivation to act on specific opportunities,

and more general support and encouragement to stay positive and keep searching for work. Because the forum was an online, text-messaging group, participants had easy access to the information and support at all hours of the day. At times, the text activity was too much for some participants, particularly those who had already obtained steady employment or were no longer searching for work. In those situations, participants either simply ignored the conversations or removed themselves from the group. In a few, but rare circumstances, participants sent text messages to the group, requesting that they stop texting so much. These requests were usually not effective, as the other participants simply ignored the request or told the participant to turn off his phone's sound.

The forum provided participants with a functional, online community, and there are indications, despite being extremely circumscribed, that the intervention had positive impacts on reentering individuals' job searching and employment outcomes. Figure 3.5 describes the percentage difference between the experimental peer group and the individual text-messaging control group for a range of outcomes. The main intention of the peer-based forum was to expand a participant's social network, by connecting him to other jobseeking participants. However, it appears that assignment to the forum resulted in a smaller number of contacts (36 versus 46), a shorter period of time communicating with others (91 versus 124 minutes per contact), and fewer calls made and received per contact (28 versus 33 calls). These findings indicate that participants redirected their communication patterns towards the peer forum and that interaction within the forum took the place of other communication that would have occurred. This substitution process aligns well with communications scholarship, which suggests that individuals have a threshold of the number of contacts and the amount of communication that can be sustained (Miritello, Lara, et al. 2013; Miritello, Moro, et al. 2013).

Figure 3.5: The effects of assignment to a text-message, peer-based job forum



Notes: This figure displays the percentage difference of individuals assigned to the peer-based job forum (n=65) compared to individuals assigned to the individual text-messaging group (n=66). Percentage difference is calculated as: mean(peer group value) – mean(individual group value) / mean(peer group + individual group values). The lines depict the confidence intervals of the percentage difference at the 95 percent level.

The peer forum appears to have had a positive impact on a range of emotional wellbeing and employment outcomes. Participants who were assigned to the peer forum were happier (73 versus 69) and less sad (18 versus 23), stressed (26 versus 29), and angry (17 versus 22) compared to those assigned to individual text messages (see Figure 3.5). They also spent slightly more days working (18 versus 16 percent of days). It is important to emphasize that these findings are based on a small sample of individuals (n=65 for the treatment and n=66 for the control groups); however, they provide suggestive evidence that a relatively modest intervention—assignment to an anonymous, text-messaging group—can offer critical sources of

support and motivation at reentry. These results go against the commonly held belief that formerly incarcerated individuals should avoid associating with other individuals with incarceration histories at reentry, and that caseworkers or third party intermediaries are the best sources of support and job information for disadvantaged jobseekers (Fernandez 2010).

IV. DISCUSSION

This chapter finds that a dearth of contacts and communication is not a barrier to obtain work at reentry. The results offer a sharp contrast to images of socially isolated men with few social relationships apart from close family and friends. Formerly incarcerated individuals in this study had large social networks and high levels of communication over the phone. They also had relatively average levels of in-person social interaction, had high expectations that their social contacts would assist them with their job search, and obtained jobs through contacts at rates similar to other populations. Using survival analysis methods, higher levels of social connectivity are positively associated with time to first job but perceived levels of closeness to contacts are negatively associated. These results support the prevailing notion that a large network of acquaintances and weaker relationships is an important factor for finding work. Findings from the experimental intervention provide suggestive evidence that the peer forum did not expand an individual's network and social connectivity, as originally intended; rather, it replaced communication that would have occurred and redirected focus towards job searching and finding work.

These findings offer a new understanding of social connectivity and job searching among a sample of recently released individuals. Given the prevailing notion that reentering individuals are socially isolated and unable to find work through social contacts, these findings offer a very different portrait of formerly incarcerated individuals. I suggest that there are several reasons for

these differences. First, the profile of individuals who have been incarcerated and are reentering their communities is very different compared to the 1970s and 1980s, when ethnographic accounts of social isolation, crime, and job searching were written (Irwin 1987; Sullivan 1989). The prevalence of incarceration among low-income, urban, and minority males, as well as the increasing proportion of prison admissions for low-level, public order offenses, has meant that incarceration is no longer reserved for individuals who commit the most deviant and delinquent acts. Second, methodological difficulties of studying job searching and social contacts among reentering individuals have resulted in few contemporary studies. Those that do exist use broad, retrospective measures to assess job searching and finding work. This paper analyzed information collected from a variety of real-time self-reported answers, behavioral-based measures, and in-person interviews to challenge conventional notions of social isolation.

There are several limitations that must be considered in light of this paper's contributions. Most importantly, the paper used smartphone-based data collection methods to collect novel forms of observed behavior and self-reported information. Without these methods, it would have been difficult, if not impossible, to study the experiences and social processes explored in this paper. At the same time, these tools remain relatively untested, particularly with low-income or traditionally hard-to-reach groups. As the methodological chapter suggests (chapter 5), low-income groups may have different patterns of phone use compared to more advantaged groups, such as university populations, which are more commonly studied. They also might have different concerns about privacy or surveillance, which could impact data quality. Apart from accuracy of the methods, the measures presented in this paper often have few comparable baselines with which to judge how much "more" or "less" connected participants were relative to the general population. Many of these limitations will be addressed

as research continues to use these new methods with diverse populations to study social connectivity.

The findings suggest that reentering individuals are not socially isolated and are able to find work through their own social networks. However, it is not necessarily the case that individuals would not benefit from more connections to more advantaged contacts. Indeed, efforts to connect individuals to contacts outside of their existing networks may bring higher quality employment opportunities, as the jobs obtained by individuals through their current social networks are low paying, uncertain, and temporary (see Chapter 2). In this vein, scholars have made the argument to increase connections to more advantaged individuals and intermediaries in order to move reentering jobseekers from these poor-quality jobs to higher paying, long-lasting and sustainable employment (Fernandez 2010). Yet, this paper's findings question whether access to more advantaged contacts would necessarily translate into better quality work, as the proportion of employed contacts is not associated with higher quality employment. In a labor market where good jobs are a rare commodity for even higher-skilled and better-educated workers (Kalleberg 2011), is unclear whether reentering individuals can realistically compete for higher quality employment even with information and referrals from social contacts.

Appendix 3.1: Cox regression models estimating the hazard to employment, by person-week and for jobs in the formal labor market and with wages higher than $7.25 per hour

	Model A: person-week				Model B: formal labor market				Model C: hourly wage higher than $7.25			
	Coef	Exp(coef)	se(coef)		Coef	Exp(coef)	se(coef)		Coef	Exp(coef)	se(coef)	
Average number of new contacts	0.65	1.91	(0.14)	***	0.19	1.21	(0.16)		0.25	1.29	(0.10)	*
Proportion of contacts employed	-1.81	0.16	(0.57)	**	1.15	3.15	(0.87)		-0.09	0.92	(0.74)	
Mean closeness of contacts	-2.31	0.10	(0.60)	***	-2.62	0.07	(0.90)	**	-2.43	0.09	(0.80)	**
Social support scale	0.00	1.00	(0.13)		0.20	1.22	(0.17)		-0.01	0.99	(0.16)	
Age	0.00	1.00	(0.02)		-0.08	0.92	(0.04)		-0.08	0.92	(0.04)	*
Black	0.08	1.09	(0.48)		-0.96	0.38	(0.61)		-1.15	0.32	(0.56)	*
Education (less than high school)												
HS graduate/GED	0.17	1.19	(0.30)		1.27	3.55	(0.44)	**	1.44	4.24	(0.40)	***
Some college	1.07	2.90	(0.38)	**	2.25	9.48	(0.56)	***	2.05	7.78	(0.52)	***
College	-1.40	0.25	(1.16)		1.77	5.89	(1.38)		0.67	1.96	(1.30)	
Relationship status (single)												
Married	1.02	2.76	(0.64)		-0.61	0.54	(1.12)		1.10	3.00	(0.74)	
Partner	-0.22	0.80	(0.27)		-0.22	0.80	(0.37)		0.32	1.38	(0.37)	
Total children	0.22	1.25	(0.09)	*	0.11	1.11	(0.13)		0.15	1.16	(0.11)	
Self-reported health	0.15	1.16	(0.12)		-0.27	0.76	(0.18)		-0.31	0.73	(0.15)	*
Mental health diagnosis	-0.31	0.73	(0.44)		-1.19	0.30	(0.77)		-1.23	0.29	(0.77)	
Living in a shelter	-0.54	0.58	(0.40)		-0.43	0.65	(0.55)		-0.25	0.77	(0.52)	
Length of recent incarceration	0.04	1.04	(0.04)		0.09	1.10	(0.05)		0.09	1.10	(0.05)	

Table continued on next page

Age at first incarceration	-0.03	0.97	(0.03)		0.00	1.00	(0.04)		0.06	1.06	(0.04)	
Any formal labor market job	-0.72	0.48	(0.33)	*	-0.91	0.40	(0.44)	*	-0.84	0.43	(0.42)	*
Any felony conviction	0.07	1.07	(0.36)		0.57	1.77	(0.42)		0.32	1.38	(0.42)	
Number of convictions	0.05	1.05	(0.06)		0.16	1.17	(0.04)	***	0.12	1.13	(0.04)	**
Number of incarcerations	-0.29	0.75	(0.19)		-0.14	0.87	(0.28)		0.26	1.30	(0.23)	
N		630				7874				7496		

*p<0.05, **p<0.01, ***p<0.001

Notes: the coefficient estimates describe the effect of a one-unit difference in the covariate on the log hazard. The middle columns report the antilog of each coefficient, which are commonly referred to as hazard ratios. The third columns describe the standard error of the coefficient.

Chapter 4. Job search and emotional wellbeing at reentry

Individuals who are recently released from prison confront numerous barriers to obtain work. A concern is that the enormity of these obstacles leads to frustrations, disappointments, and unhappiness with job searching, and that low emotional wellbeing explains high rates of joblessness after prison. Using novel person-day information collected in real time from smartphones, this paper provides the first empirical study of emotional wellbeing and job searching at reentry. In contrast to prevailing notions, lower levels of happiness reported on one day are associated with greater probabilities of searching the following day. Individuals also report that they are happier when they are searching for work, as compared to when they are not searching. However, gains in happiness appear to be short lived and individuals are less happy the day following their search activities. Taken together, the findings describe a reentry period characterized by relatively high levels of happiness and suggest that emotional distress at reentry does not push individuals out of the labor market in the short term.

Finding work at reentry from prison is viewed by policy makers, researchers, and advocates as a key, if not the primary, factor for successful reintegration and preventing recidivism. Numerous barriers to employment, resulting from the dual limitations of having a criminal record and an incarceration experience, paint a dire portrait of employment prospects among reentering individuals. These obstacles likely prolong the job search experience, increase the frustrations of being denied work, and heighten the stress of needing to find work under constrained financial circumstances. For individuals on parole, who are often required to find employment as part of their status, remaining unemployed invites the threat of disciplinary sanctions and increased supervision. Under these circumstances, the normal stress and emotional toll of searching for work experienced by the general population of unemployed jobseekers is potentially greater and more severe among reentering individuals. The concern is that frustrations, stress, and unhappiness with job searching lead to less search activity and eventually, exit from the labor market.

This line of thought is reasonable: since unemployed individuals in the general population experience lower wellbeing as they search for work, unemployed reentering individuals likely experience even more negative feelings, stress, and frustrations given the higher barriers they face. However, a closer examination of the proposed reasons for low emotional wellbeing among jobseekers suggests that the different set of experiences and expectations that reentering individuals bring to their job searches might be consequential. Unlike typical unemployed jobseekers, reentering individuals do not undergo job loss and the downward shift from being employed to unemployed. Instead, reentering individuals experience positive transitions from incarceration and confinement to relative freedom. As qualitative accounts describe, their search for work is often more than a means to an end but also a sign that

they are "doing good" (Irwin 1987). The different orientations toward job searching among reentering individuals may complicate our initial understanding of emotional wellbeing and job searching as decidedly negative.

This paper provides the first empirical investigation of the role of emotional wellbeing for job searching at reentry. Using person-day information on emotional wellbeing and job searching among 130 reentering individuals in Newark, New Jersey, the paper contributes a detailed understanding of happiness among jobseekers during the immediate months at reentry. In the following section, I briefly describe scholarship on emotional wellbeing and job searching after prison, as well as research on the more general population of unemployed jobseekers. I discuss several theoretical explanations for decreased emotional wellbeing among jobseekers and describe how these propositions might extend to formerly incarcerated individuals. I then describe the data, measures and analytic methods used in the paper. Section III describes the results and section IV concludes with a discussion of the paper's contributions and potential limitations.

I. BACKGROUND

Scholarship describes the reentry period as chaotic and uncertain, characterized by high aspirations formulated within prison and by disappointments experienced after release (Irwin 1987). This emotionally turbulent time period provides an important context for reentry experiences. Qualitative accounts describe the immediate months after release as a contrast in identities and expectations, where individuals feel pulled between "doing good" or going back to the streets (and illicit activities) in order to provide for themselves and their families (Braman 2004). The job search process is part of this emotional roller coaster, where frustration and unhappiness from failed job leads or disappointing job interviews accumulate. As John Irwin

writes, "when this final disappointment—failure to reach the level of "doing good"—is recognized and consciously accepted, the ex-convict is at a critical turning point. At this time, he either reorganizes his thinking about the future and alters his plans, perhaps scaling down his aspirations and reconciles himself to a generally less satisfying life than he had hoped for, or he veers back to the old bag" (144). Similar to Irwin's account, Devah Pager finds that the actors in her audit study of criminal record stigma experience disappointments and lowered self-esteem as a result of cumulative rejections and employer disapproval. She suggests that feelings of diminished self-confidence and frustration will be more acutely felt by individuals with actual criminal records and incarceration experiences, leading them to either exit the labor market or internalize negative perceptions (Pager 2007). The reentry period is understood as an emotionally laden time period, where disappointments and frustrations lead individuals to drop out of job search and return to the streets.

Emotional wellbeing and unemployment

Although there is no quantitative research on emotional wellbeing and job searching at reentry, scholarship on unemployed jobseekers in the general population has recently begun to focus on psychological explanations for search persistence (Young 2010; Krueger and Mueller 2011; McKee-Ryan et al. 2005; Wanberg, et al. 2010). These studies find that individuals experience lower wellbeing when they are unemployed (Crossley and Stanton 2005; Krueger and Mueller 2011; McFadyen and Thomas 1997; Paul and Moser 2009; Winkelmann and Winkelmann 1998; Young 2012), and that individuals are particularly sad when they search (Krueger and Mueller 2011).

Several theories explain the association between low emotional wellbeing and unemployment among the general population of jobseekers. These perspectives focus on the lack

of non-financial benefits provided by employment, such as social interaction, structured daily routines, collective purpose, and valued social status as a working person (Jahoda 1981; Warr 1987). Explanations also emphasize restricted agency among unemployed jobseekers, where financial limitations, an uncertain future, and stigma resulting from unemployment restrict an individual's ability to effectively plan and execute behavior (Fryer and Payne 1984; Paul and Moser 2009). These perspectives contend that unemployed individuals receive fewer psychological benefits relative to those who are employed. Implicit is the assumption that an individual's current position of unemployment is less beneficial compared to his or her previous situation.

Emotional wellbeing and job searching at reentry

Given the explanations above, it is not clear that jobseekers at reentry would experience lower levels of emotional wellbeing similar to their unemployed counterparts in the general population. Reentering individuals embark on their job searches from very different initial circumstances compared to other unemployed jobseekers. They move from a situation of being incarcerated to reentering the community; from a position of dependence and constrained agency to one where they can plan their daily schedules, decide what job openings they will pursue, and reconnect with family and friends. Compared to their former situation of incarceration, reentering individuals receive more non-financial benefits, despite their status as unemployed jobseekers. Even though reentry is an overwhelming and destabilizing period, reentering individuals have greater individual agency compared to their incarcerated status, and they can choose how to structure their time, what leisure activities to pursue, and whether to find a romantic partner (Irwin 1987). Added to this, reentering individuals have not recently lost a job, whereas jobseekers in the general population have often just experienced the demoralizing and

stressful event of job loss. There is evidence that losing a job is a main contributor to the negative feelings and lower emotional health experienced among unemployed individuals (Kinicki and Latack 1990; McKee-Ryan et al. 2005; Young 2012). Reentering individuals are different on all of these dimensions.

Reentering individuals not only start their job searches from very different circumstances compared to jobseekers in the general population, but they also likely have different expectations for their future. In the unemployment and wellbeing models discussed above, jobseekers in the general population are portrayed as very committed to finding work and being employed. However, individuals actually have varying levels of "employment commitment" and research finds that feelings of unhappiness during unemployment are moderated by level of commitment (Paul and Moser 2006). From this perspective, lower emotional wellbeing during unemployment is a product of incongruent identities, where distress occurs because unemployment does not align with an individual's self-perception as a working person.

For reentering individuals, the expectant identity may be different from unemployed jobseekers in the general population. They may desire to stay out of prison, to avoid illicit work, or to maintain a conventional lifestyle. Persisting in job searching may narrow the disconnection for reentering individuals, where the act of searching itself signifies a commitment to staying straight (Irwin 1987). Recent scholarship affirms the importance of perceived job search progress for emotional wellbeing. Although the experience of job searching is characterized by emotional highs and lows, individuals increase job searching activities when they perceive a discrepancy between desired and actual search progress, and they feel positive about their search when incremental search activities are accomplished (Wanberg et al. 2010). The idea that search

activity increases in order to narrow discrepancy or incongruence is referred to as control theory (Wanberg et al. 2010)

Thus far, the discussion has emphasized how reentering individuals might begin their job searches from positions of emotional advantage compared to other jobseekers. However, it is equally important to describe the unusually high obstacles to employment faced by reentering individuals. Recently incarcerated individuals are barred from certain legal professions and occupations due to their criminal records (Love, Roberts, and Klingele 2013). They experience stigma from employers resulting from dual identities as individuals with felony convictions and incarceration histories (Pager 2007). Reentering individuals often have poor employment histories prior to incarceration, and time out of the labor market due to imprisonment may have deteriorated their job skills. Moreover, individuals often live in neighborhoods that already lack adequate employment opportunities, particularly for low-skill workers (Wilson 1996, 2012). The many barriers faced by reentering individuals suggest that the usual disappointments and rejections experienced by jobseekers are likely more common, intense and prolonged. Scholarship on job searching and wellbeing at reentry emphasizes these obstacles, and discusses the accumulation of rejections and low emotional wellbeing leading to either exit from the labor market or dampened expectations (Irwin 1987; Pager 2003). The idea that frustrations and lower perceived progress reduces subsequent search activity and emotional wellbeing aligns with social cognitive theory (described in Wanberg et al. 2010).

Although reentry narratives suggest that downward spirals of unhappiness lead to lower levels of job searching and eventual exit from the labor market, it is unclear how emotional wellbeing and job searching are associated. Using person-day information on searching and wellbeing, and specifically happiness, I examine three questions:

- How is happiness associated with job searching? Are reentering individuals particularly unhappy during job searching activities, similar to jobseekers in the general population?
- How is happiness related to future probabilities of job searching?
- How is job searching associated with future feelings of happiness?

Real-time assessments of emotional wellbeing

Despite the importance of understanding how emotional wellbeing is associated with job search persistence, scholarship has only recently begun to empirically assess these questions with real-time reports (Krueger and Mueller 2011; Wanberg et al. 2010). Prior scholarship commonly relied on retrospective self-reports or very few time points (e.g., emotional wellbeing measured at two points in time) (Crossley and Stanton 2005). These approaches were unable to capture important aspects about the day-to-day emotional fluctuations that characterize feelings about searching (Wanberg et al. 2010) and were likely biased by recall factors (Schwarz 2007). Memory-related biases result from several processes, including a respondent's tendency to use his or her current feelings as a benchmark for previous emotions, the inclination to put greater weight on brief but intense feelings, and the propensity to minimize or forget about irregular events or emotions (Schwarz 2007). Bias associated with retrospective reports may also be moderated by different personality factors, where extroverted individuals tend to positively inflate their emotional wellbeing in the recent past (Barrett 1997).

To address retrospective reporting biases, recent studies utilize online surveys to collect real-time reports of emotions over several weeks (Krueger and Mueller 2011; Wanberg et al. 2010). Although these studies contribute new knowledge about the psychological dimensions of job searching, they are limited by low participation and high attrition rates. For this paper, I utilize smartphones as data collection tools to administer surveys about emotional wellbeing and

job searching in real time, as people go about their daily routines. Although smartphones are relatively new data collection methods, recent studies suggest that they are potentially powerful devices for studying the social world (Raento et al. 2009). As opposed to online surveys that are commonly accessed on a computer, smartphone-based surveys can be completed through a mobile interface, facilitating the frequent collection of measures in everyday environments and higher participation rates, as described in chapter 5.

II. DATA, MEASURES, AND METHODS

This paper analyzes data from the Newark Smartphone Reentry Project (NSRP). In this chapter, I restrict the analysis sample to the 130 individuals that sent information via smartphones on the happiness and job searching measures considered below. I excluded five individuals with high levels of missing smartphone survey data.[15]

Data and measures

Data for this paper come from several sources, including smartphone-based surveys, in-person interviews, and administrative records. Participants received smartphone surveys about their search activities and emotional wellbeing twice a day. The first survey ("experience sampling survey") was sent at a random time between the hours of 9am and 6pm and asked about activities and feelings at that specific moment. The second survey ("daily survey") was sent at 7pm and inquired about activities and feelings for that day. Measures of job searching, working, and emotional wellbeing are based on answers received on both of these surveys, as described in the measures section below. Information on demographics and other person-level characteristics of respondents was collected at the initial interview. Information on criminal

[15] Five individuals completed daily smartphone surveys on fewer than two days. One of these individuals was unable to complete any smartphone surveys because he felt uncomfortable responding to the survey prompts. He was older (58 years old) and reported serious mental health issues. The other four individuals ranged in age from 21 to 45 years old.

justice history, including previous felony convictions and incarcerations, comes from administrative records from the New Jersey Parole Board. They measure criminal justice contact that occurred within New Jersey State.

Job searching and working. Information on job searching and working is collected at the person-day level, and is based on answers received on the experience sampling and daily surveys. If a participant states that he searched for work or worked on either of these surveys, he is coded as searching or working for that day.

Happiness. Information on happiness comes from answers received from the daily survey and, in some models, answers from the experience sampling survey. Individuals report their level of happiness by moving a sliding bar that ranges from 0 (not at all happy) to 100 (very happy) on their phone surveys. The bar's default position was set at 50, but participants had to move the bar to proceed to the next survey question.

Demographic and person-level characteristics. Numerous covariates are included as controls in all models. These include basic demographic information, such as age, race, educational attainment, relationship status, and number of children. Several measures on health and mental health status are also included, as well as shelter residence at reentry and length of most recent incarceration. These measures come from the initial interview.

Pre-incarceration factors. The models also include several characteristics that occurred prior to the most recent incarceration. These include the participant's age at first incarceration and whether the participant had ever been employed in the formal labor market. Both of these measures come from the initial interview. Other pre-incarceration factors measure criminal justice history drawn from administrative records, including whether the participant had a

previous felony conviction, total number of convictions (including misdemeanors), and total number of incarcerations in state prison.

Methods

To examine the association between job searching and happiness, I use person-day information to estimate several mixed effects regression models. A mixed model includes both fixed and random effects, allowing for correlated within-person observations. The fixed effects are comparable to conventional regression coefficients, and they estimate the average associations for the sample. In all models, I include a random effect at the individual level for the intercept.

To estimate the probability of searching, I use a mixed effects logit model with a random intercept u_j,

$$\Pr(search_{tj} = 1 \mid x_{tj}, u_j) = H(\beta_0 + \beta_1 happy_{tj} + \beta_2 work_{tj} + \beta_3 happy_{t-1j} + \beta_4 search_{t-1j} + \beta_5 work_{t-1j} + \cdots + \beta_k x_k + u_j$$

I include fixed effects for happiness and work on the current day $_t$ and the previous day $_{t-1}$. I also control for searching on the previous day $_{t-1}$. For these analyses, I use the xtmelogit command in Stata, which is based on a logistic cumulative distribution function $H(\cdot)$ and estimates the log likelihood by adaptive Gaussian quadrature with seven integration points (Rabe-Hesketh and Skrondal 2008).

To estimate happiness, I fit a linear mixed effects model

$$happy_{tj} = \beta_0 + \beta_1 search_{tj} + \beta_2 work_{tj} + \beta_3 search_{t-1j} + \beta_4 happy_{t-1j} + \beta_5 work_{t-1j} + \cdots + \beta_k x_k + u_j$$

In addition to this model, which regresses future happiness on prior search, I also estimate a linear mixed effects model using answers from the experience sampling surveys to explore contemporaneous associations between happiness and searching.

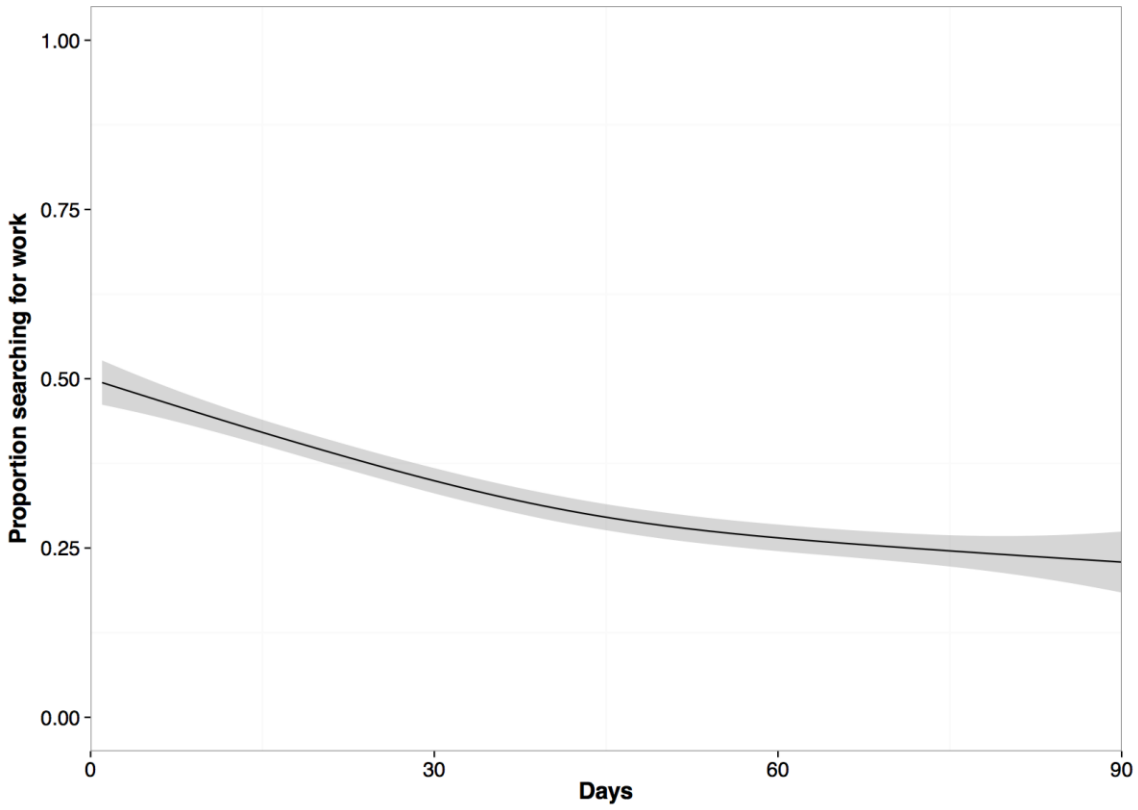
Mixed models are often used to analyze high frequency, longitudinal data, which are characteristic of information collected from smartphones (Walls and Schafer 2005). Two-level mixed models, where observations are nested within individuals, adjust for correlated observations and accommodate unbalanced data, where individuals have irregular numbers of person-day observations. Missing data is a concern with these types of data formats, and in this paper, I have taken the more conservative approach of excluding missing data from the estimated models. After accounting for missing data, the models consider samples of person-day observations that range from 5,426 to 6,625, which represents between 129 and 130 individuals. This translates into an average of 42 to 51 person-day observations per individual.

III. RESULTS

As the second chapter found, participants spent more time searching for work at the beginning of the study period, with the proportion of days searching decreasing over time. Figure 4.1 describes the proportion of non-working person-days that are spent job searching over the three months. At the beginning of the study, nearly half of non-working person-days are spent job searching. By the end of the three months, less than one-quarter of non-working person-days are spent looking for work.

Table 4.1 provides descriptive statistics for the sample, including mean happiness on days job searching and on days not searching. As the table shows, individuals report moderately higher levels of happiness on days that they look for work (72 compared to 69, on a scale from 0 to 100). In general, it is striking that individuals report relatively high levels of happiness

Figure 4.1: Proportion of non-working person-days spent searching for work



Notes: this figure excludes person-days that are spent working and is based on 5,823 person-days (and 130 individuals).

overall. In order to describe the distribution of happiness values, Figure 4.2 presents histograms that distinguish days searching and not searching for work. Because of the survey question design, where individuals are asked to move a sliding bar on the phone's touchscreen, the happiness values are concentrated at the ends of the scale. It is notable how often individuals report that they are very happy, at the topmost end of the scale, as opposed to reporting that they are not at all happy.

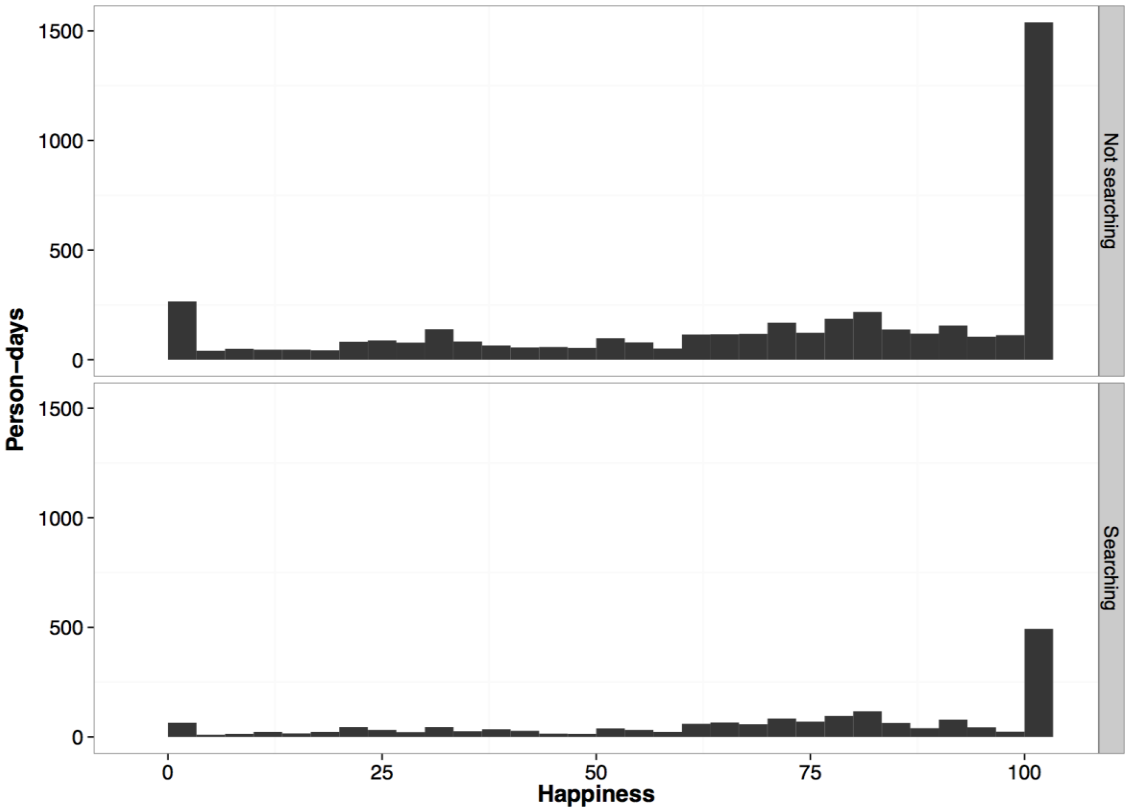
The remaining analyses estimate associations between happiness and job searching using regression models. Table 4.2 presents odds ratios estimated from the mixed effects logistic regression models, which predict whether an individual searches for work given lagged values of happiness. Model A (left column) presents the basic model, with lagged measures only. As the

Table 4.1: Descriptive statistics, n=130

	Mean/%	SD
Happiness on job searching days	72.10	(22.35)
Happiness on non-searching days	69.48	(23.19)
Searching	31.86	
Working	16.97	
Social support scale: 0 to 5	4.01	(1.18)
Age: yrs	35.76	(10.10)
Black	90.77	
Education		
Less than HS	28.46	
HS graduate/GED	46.15	
Some college	23.08	
College	2.31	
Relationship status		
Single	48.46	
Partner	46.15	
Married	5.38	
Total children	1.55	(1.47)
Self-reported health (1 excellent to 5 poor)	2.25	(1.16)
Mental health diagnosis	9.23	
Living in a shelter	15.38	
Length of recent incarceration: yrs	4.24	(3.73)
Age at first incarceration: yrs	24.15	(6.59)
Any formal labor market job	78.46	
Any felony conviction	77.69	
Number of convictions	5.95	(4.09)
Number of incarcerations	0.96	(1.16)
N	130	

Note: happiness on job searching days is based on a sample of N=125 and happiness on non-searching days is based on a sample of N=128. In the former case, five individuals did not report days job searching or happiness values on those days. In the latter case, two individuals did not report days not job searching or did not report happiness values on those days.

Figure 4.2: Counts of daily reports of happiness, by days searching and not searching



Notes: this figure is based on 6,945 person-day reports of happiness and job searching (and 130 individuals).

model shows, lagged values of happiness are negatively associated with future probabilities of searching, suggesting that lower levels of happiness predict higher levels of searching the following day. Model B (right column) adds contemporaneous measures of happiness and work to the basic model, in order to determine whether the association of happiness for future search is conditional on future happiness or future work. As Model B shows, the association between lagged happiness and future search remains unchanged.

To better interpret the magnitude of these associations, Figure 4.3 displays predicted probabilities of searching for work at various values of lagged and current happiness. As shown

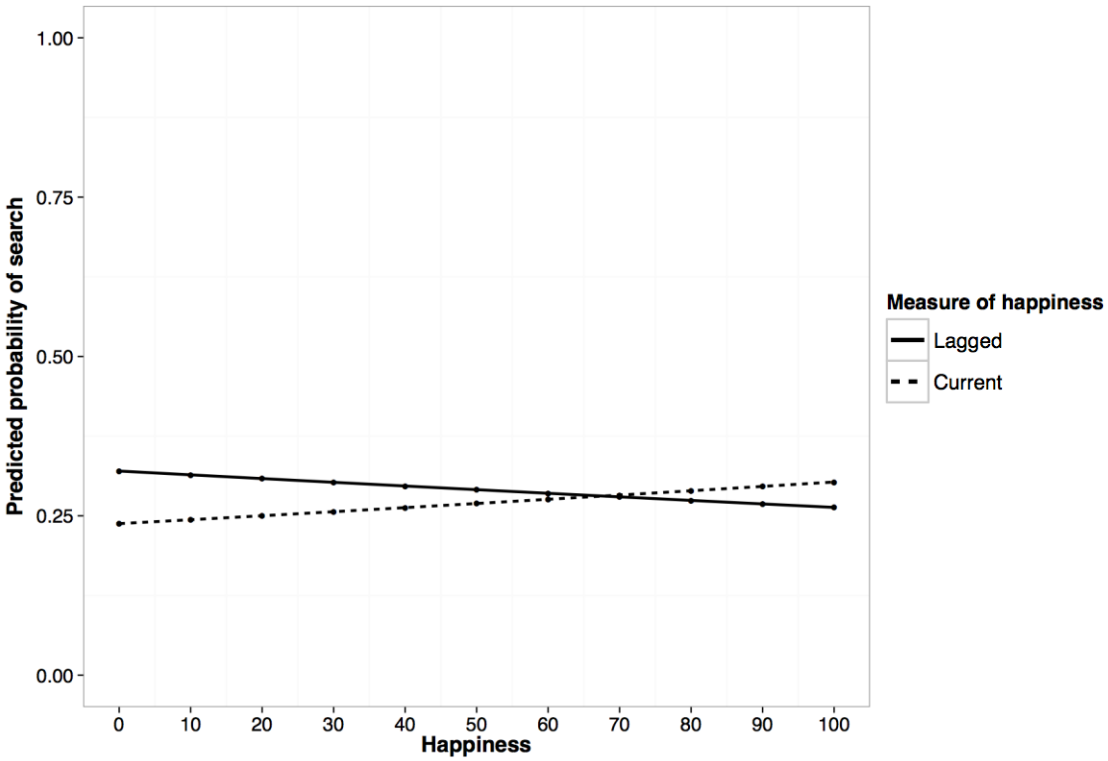
Table 4.2: Mixed effects logistic regression predicting job searching

	Model A			Model B		
	Odds ratios	SE		Odds ratios	SE	
Current happiness: 0 to 100				1.004	(0.001)	**
Current work				0.420	(0.054)	***
Lagged happiness: 0 to 100	0.997	(0.001)	*	0.996	(0.001)	*
Lagged search	2.232	(0.154)	***	2.222	(0.158)	***
Lagged work	0.609	(0.068)	***	0.759	(0.093)	*
Days	0.979	(0.002)	***	0.980	(0.002)	***
Social support scale: 0 to 5	0.880	(0.068)		0.863	(0.066)	
Age: yrs	1.023	(0.016)		1.025	(0.016)	
Black	0.965	(0.298)		0.929	(0.283)	
Education (Less than HS)						
HS graduate/GED	0.926	(0.187)		0.926	(0.186)	
Some college	1.513	(0.371)		1.636	(0.398)	*
College	0.731	(0.401)		0.686	(0.370)	
Relationship status (Single)						
Married	1.053	(0.435)		0.978	(0.402)	
Partner	1.442	(0.264)	*	1.430	(0.260)	*
Total children	1.119	(0.073)		1.100	(0.071)	
Self-reported health (1 excellent to 5 poor)	0.821	(0.061)	**	0.820	(0.061)	**
Mental health diagnosis	1.037	(0.297)		0.942	(0.269)	
Living in a shelter	1.205	(0.309)		1.215	(0.308)	
Length of recent incarceration: yrs	1.064	(0.026)	*	1.050	(0.026)	*
Age at first incarceration: yrs	1.029	(0.016)		1.027	(0.016)	
Any formal labor market job	1.028	(0.224)		0.985	(0.214)	
Any felony conviction	0.939	(0.217)		0.954	(0.218)	
Number of convictions	0.941	(0.027)	*	0.935	(0.027)	*
Number of incarcerations	1.391	(0.163)	**	1.369	(0.160)	**
Intercept	0.216	(0.125)	**	0.201	(0.116)	**
Individuals	130			129		
Person-days	6625			6440		

*p < 0.05, **p < 0.01, ***p < 0.001

Notes: the number of person-days excludes the first day of observations for all participants in order to include the lagged values.

Figure 4.3: Predicted probability of search, given lagged and current happiness



Notes: this figure displays predicted probabilities based on the estimates described in Table 4.2. It is based on 6,440 person-days and 129 individuals.

by the solid line, the increase in lagged happiness from one end of the scale to the other (or, an increase of 100 units) decreases the probability of searching the following day from 32 percent to 26 percent. As shown by the dashed line, the increase in current happiness from one end of the scale to the other is associated with a concurrent increase in job searching from 24 percent to 30 percent. The change in happiness is therefore associated with a relatively modest but still important difference in the predicted probabilities of searching.

In the next set of models, I estimate the associations between future happiness and lagged measures of searching in order to describe how job searching is related to future wellbeing. Model A of Table 4.3 presents results from the main linear mixed effects regression model, which includes lagged measures of searching. As the table shows, lagged search is associated

with a 1.8 unit decrease in happiness reported the following day. The negative association remains nearly unchanged when contemporaneous measures of search and work are included, as described in Model B. These models suggest that the association between lagged searching and future happiness is not conditional on future reports of searching and working. Although the magnitude of the negative association between lagged search and future happiness is again relatively modest, the findings suggest that the gains in happiness experienced during job searching diminish by the following day.

The above models are based on reports of general and overall happiness; however, individuals were also asked how happy they felt about their job searches, in particular. These questions were only administered to respondents who reported that they were searching for work, and therefore consider a smaller sample of individuals and person-days. As reported in the Appendix 4.1, the estimated associations with these alternative measures of happiness are very similar in magnitude and statistical significance compared to the estimates with the broader measure of happiness and the larger sample. For the model estimating happiness, the size of the associations is slightly larger, where lagged search is associated with a 3.1 unit decrease in happiness the following day. These replications with alternative measures of happiness provide additional support to the estimated associations described in Tables 4.2 and 4.3.

Throughout the above discussion, the inclusion of contemporaneous measures of happiness and searching was used primarily to test potential mediators for the associations between lagged and future measures of searching and happiness. However, the idea that individuals report higher levels of happiness on the days that they search for work is a somewhat surprising finding, given that jobseekers in the general population feel particularly sad while job searching (Krueger and Mueller 2011). To provide an additional test of this association, Table

Table 4.3: Mixed effects linear regression predicting happiness

	Model A			Model B		
	Coef.	SE		Coef.	SE	
Current search				1.880	(0.682)	**
Current work				5.991	(0.917)	***
Lagged search	-1.769	(0.682)	**	-1.795	(0.689)	**
Lagged happiness: 0 to 100	0.330	(0.012)	***	0.329	(0.012)	***
Lagged work	3.307	(0.880)	***	1.691	(0.916)	
Days	-0.066	(0.014)	***	-0.065	(0.015)	***
Social support scale: 0 to 5	2.964	(1.158)	**	3.004	(1.163)	**
Age: yrs	0.096	(0.234)		0.087	(0.235)	
Black	-8.816	(4.507)	*	-8.710	(4.528)	
Education (Less than HS)						
HS graduate/GED	-2.152	(3.021)		-2.155	(3.036)	
Some college	-3.817	(3.737)		-4.127	(3.755)	
College	-7.256	(8.622)		-7.004	(8.665)	
Relationship status (Single)						
Married	2.663	(6.237)		2.998	(6.266)	
Partner	-1.863	(2.725)		-1.965	(2.738)	
Total children	0.280	(0.988)		0.318	(0.992)	
Self-reported health (1 excellent to 5 poor)	-2.067	(1.103)		-1.931	(1.108)	
Mental health diagnosis	-4.199	(4.268)		-3.991	(4.288)	
Living in a shelter	-1.662	(3.943)		-1.719	(3.962)	
Length of recent incarceration: yrs	0.402	(0.370)		0.388	(0.371)	
Age at first incarceration: yrs	0.201	(0.234)		0.206	(0.235)	
Any formal labor market job	0.006	(3.260)		0.339	(3.275)	
Any felony conviction	1.355	(3.466)		1.099	(3.483)	
Number of convictions	0.154	(0.418)		0.136	(0.420)	
Number of incarcerations	1.395	(1.773)		1.399	(1.782)	
Intercept	39.236	(8.567)	***	37.760	(8.610)	***
Individuals	129			129		
Person-days	6640			6440		

*p < 0.05, **p < 0.01, ***p < 0.001

Notes: the number of person-days excludes the first day of observations for all participants in order to include the lagged values.

4.4 estimates the relationship between happiness and job searching using information from the experience sampling surveys. In contrast to the previous models, which are based on happiness reports at the end of the day and are collected from the 7pm survey, the model in Table 4.4 is

Table 4.4: Mixed effects linear regression predicting happiness, based on experience sampling surveys

	Coef.	SE	
Currently job searching	16.777	(1.585)	***
Days	-0.027	(0.026)	
Social support scale: 0 to 5	3.516	(1.435)	*
Age: yrs	0.103	(0.291)	
Black	-7.719	(5.647)	
Education (Less than HS)			
HS graduate/GED	-6.612	(3.775)	
Some college	-4.009	(4.670)	
College	0.838	(10.675)	
Relationship status (Single)			
Married	6.315	(7.715)	
Partner	-0.069	(3.420)	
Total children	1.074	(1.247)	
Self-reported health (1 excellent to 5 poor)	-2.758	(1.386)	*
Mental health diagnosis	-5.741	(5.285)	
Living in a shelter	2.025	(4.878)	
Length of recent incarceration: yrs	1.056	(0.470)	*
Age at first incarceration: yrs	0.328	(0.294)	
Any formal labor market job	-0.495	(4.081)	
Any felony conviction	0.426	(4.309)	
Number of convictions	0.660	(0.529)	
Number of incarcerations	0.055	(2.222)	
Intercept	30.679	(10.820)	**
Individuals	130		
Person-days	5426		

*p < 0.05, **p < 0.01, ***p < 0.001

based on concurrent reports of job searching and happiness from randomly sampled time points throughout the day. As the table describes, individuals report much higher levels of happiness while they are searching for work compared to being engaged in other, non-searching activities. When individuals are searching for work, they report happiness levels that are nearly 17 units higher, on a 100-point scale. Although this model is unable to distinguish the direction of the

association, such as whether individuals choose to search when they are happier or whether they feel happier because they are searching, it provides additional evidence of a positive association between contemporaneous reports of happiness and job searching.

IV. DISCUSSION

This paper contributes the first study of emotional wellbeing and job searching after prison. Contrary to reentry narratives, reentering individuals do not experience downward spirals of unhappiness, with eventual exit from the labor market. Instead, lower levels of happiness prompt higher probabilities of searching the following day, and individuals report feeling happier when they are searching for work. These findings align well with the idea that job searching is a self-regulation process, where lower levels of happiness, or perceived progress, pose a discrepancy between desired and actual behavior and stimulate future search (Wanberg et al. 2010). As this framework suggests, individuals feel better when they accomplish incremental goals related to job searching, even if they are unable to attain the ultimate objective of employment at that time.

Despite the gains in emotional wellbeing experienced while job searching, individuals report feeling less happy on the day after searching. This suggests that the increases in happiness during searching are short-lived, and that searching eventually leads to lower future emotional wellbeing. Taken together, the findings describe associations between emotional wellbeing and job searching that are substantially different day-to-day, which affirm the momentary nature of psychological factors for search and emphasize the importance of collecting information in real time.

If lower happiness leads to greater probabilities of future searching, why do individuals decrease search activity over time? A question asked on the daily smartphone survey provides

some insight. When participants report not searching for work for that day, they are asked why they did not search. They are presented with several different possible answers from which they can choose, including an "other" category. Very few participants stated that they "didn't feel like searching" or felt "discouraged" (3.9 percent and 2.2 percent of person-days, respectively). Instead, the most common answer was that they were "too busy," which was provided as an explanation 36 percent of the time. Transportation problems, which are concerns in the reentry literature, were reported 10 percent of the time and health issues were reported 11 percent. The low percentage of answers expressing discouragement or dissatisfaction aligns with a recent person-day study of searching among unemployment insurance recipients (Wanberg et al. 2010). Based on these stated reasons and the paper's analyses, it does not appear that emotional wellbeing is a consequential factor for diminished search activity. An alternative explanation is that individuals increasingly view their time as better spent on other activities. Future studies on the nature of these other activities, such as whether they are income generators or provide in-kind support to family, would be fruitful.

This paper contributes the first empirical study of emotional wellbeing and job searching at reentry; however, there are several limitations that should be considered. First, the use of smartphones as data collection tools is relatively new and there may be biases related to the use of these methods to measure emotional and social experiences over time. In this study, participants reported their happiness over a three-month period. Frequent reporting of emotional wellbeing may be more prone to participant error or fatigue (Shiffman 2007), which could lead to underestimates of the true association between happiness and searching. Second, the use of a sliding bar to measure happiness is not commonly used to assess emotional wellbeing, and participants often recorded their answers at the extreme ends of the sliding scale. Results from

models that estimate associations using a happiness variable transformed to a logarithmic scale suggest that the form of the happiness variable does not change the substantive findings; however, it is not common to measure emotional wellbeing with a sliding scale on smartphone touch-screens. The salience of these potential issues will be better assessed as future scholarship using smartphones becomes more prevalent; however, it is important to emphasize that this paper's analyses would not have been possible without the use of new and novel methods for the real-time collection of emotional wellbeing information.

In many ways, the findings in this paper describe a relatively optimistic account of emotional wellbeing and searching compared to reentry scholarship that focuses on the obstacles to employment. On average, reentering individuals do not experience negative, downward spirals of wellbeing. Instead, they feel happier when they search for work, and lower levels of happiness predict higher probabilities of job searching the following day. However, these gains are temporary and short lived, and individuals feel less happy the day after searching. These associations are relevant to the first several months after prison, and it is likely that they would change under a longer time horizon. At the same time, most reentering individuals have largely ceased job searching efforts within the first three months after release, as described in chapter 2. Overall, the findings suggest that individuals feel relatively happy after prison and that emotional distress does not lead to decreased job searching and labor market exit, at least in the short term.

Appendix 4.1: Mixed effects regression models, where happiness is specific to job searching

	Outcome: search			Outcome: happiness about search		
	Odds ratios	SE		Coef	SE	
Current happiness about search: 0 to 100	1.015	(0.001)	***			
Lagged happiness about search: 0 to 100	0.997	(0.001)	*	0.193	(0.014)	***
Current search				9.775	(0.864)	***
Lagged search	2.229	(0.172)	***	-3.069	(0.876)	***
Current work	0.962	(0.169)		3.843	(1.791)	*
Lagged work	0.960	(0.170)		1.790	(1.798)	***
Days	0.986	(0.002)	***	-0.088	(0.020)	***
Social support scale: 0 to 5	0.868	(0.068)		1.921	(1.384)	
Age: yrs	1.033	(0.016)	*	-0.003	(0.281)	
Black	0.877	(0.279)		-2.400	(5.459)	
Education (Less than HS)						
HS graduate/GED	0.950	(0.200)		-3.660	(3.651)	
Some college	1.999	(0.512)	**	-6.453	(4.548)	
College	0.877	(0.494)		-17.097	(10.298)	
Relationship status (Single)						
Married	0.659	(0.280)		10.116	(7.370)	
Partner	1.452	(0.276)	*	-0.512	(3.295)	
Total children	1.055	(0.072)		1.501	(1.207)	
Self-reported health (1 excellent to 5 poor)	0.839	(0.065)	*	-1.643	(1.341)	
Mental health diagnosis	0.860	(0.253)		-7.682	(5.025)	
Living in a shelter	1.081	(0.284)		0.227	(4.699)	
Length of recent incarceration: yrs	1.046	(0.027)		0.813	(0.462)	
Age at first incarceration: yrs	1.020	(0.017)		0.518	(0.287)	
Any formal labor market job	1.110	(0.252)		-7.801	(3.916)	*
Any felony conviction	1.078	(0.255)		1.942	(4.134)	
Number of convictions	0.948	(0.028)		-0.176	(0.505)	
Number of incarcerations	1.169	(0.143)		2.971	(2.141)	
Intercept	0.088	(0.053)	***	30.354	(10.551)	**
Individuals	126			126		
Person-days	4916			4916		

*p < 0.05, **p < 0.01, ***p < 0.001

Notes: The left column reports estimates from a mixed effects logistic regression model. The right column reports estimates from a mixed effects linear regression model.

Chapter 5. Utilizing smartphones to study disadvantaged and hard-to-reach groups

Mobile technologies, specifically smartphones, offer social scientists a potentially powerful approach for examining the social and behavioral world. They enable researchers to collect information that was previously unobservable or difficult to measure, expanding the realm of empirical investigation. For projects that concern poor and hard-to-reach groups, smartphones may be particularly advantageous, by lessening sample selection and attrition and by improving measurement quality of irregular and changeable experiences. At the same time, smartphones are nascent social science tools, particularly with less advantaged populations that may have different phone usage patterns or privacy concerns. Using findings from a smartphone study of individuals recently released from prison, this paper discusses the strengths and challenges of utilizing smartphones as data collection tools among traditionally hard-to-reach groups.

Smartphones, or programmable mobile phones, are increasingly viewed as groundbreaking new data collection tools for studying human behavior. They are flexible devices, which can collect a range of data types and can be utilized in both small-scale projects and large-scale studies of population movement and patterns. Data can be collected passively in the background or interactively with frequent communication with the user. Smartphones can also be utilized as interventions, where information sent in real time is used to change behavior, attitudes, or wellbeing. Despite the potential capabilities of smartphones to improve our understanding of the social world across a range of contexts and at varying levels of granularity, the social sciences have been slow relative to other disciplines in capitalizing on these new technologies.

Scholarship has begun to document some of the many advantages of using smartphones to collect information for social science research (Palmer et al. 2013; Raento et al. 2009). These papers, as well as other case studies and pilot projects (Bodker, Gimpel, and Hedman 2010; Eonta et al. 2011; Gaggioli et al. 2011; Gaumer et al. 2014; Goldberg et al. 2014; Plowman and Stevenson 2012; de Reuver et al. 2012), illustrate the new types of data that can be collected via phones. Notwithstanding these important contributions, many of the projects have been limited to traditionally advantaged populations, including university students and faculty (Bodker et al. 2010; Raento et al. 2009), smartphone owners (Palmer et al. 2013), or very selected samples (Gaggioli et al. 2011; Gaumer et al. 2014; Plowman and Stevenson 2012; de Reuver et al. 2012). Questions remain concerning sample selection, representativeness, and the participation of diverse populations, such as resource-poor and less technologically skilled groups, all of which are particularly important for social science research. Prior scholarship has also paid relatively sparse attention to social science concerns of measurement quality and researcher effects of

using phones to collect data. Although smartphones enable researchers to examine new types of evidence that were formerly very difficult or impossible to observe, questions about the quality of these data need to be addressed as social scientists begin to adopt new technologies.

In this paper, I discuss the strengths and potential challenges of utilizing smartphones for social science research among disadvantaged and hard-to-reach groups. I illustrate these issues with findings from a project that distributed phones to men recently released from prison and followed their experiences for three months. I consider these findings along with a randomly assigned comparison sample that participated in frequent interviews. I focus on four issues of particular concern to researchers working with hard-to-reach groups: sample selection and attrition, measurement of irregular and changeable patterns, data quality, and researcher effects. I suggest that the advantages of smartphones for social science research may be particularly beneficial for studying groups that are hard-to-reach using traditional methods. At the same time, there are issues specific to these groups that potentially affect data quality and the validity of measures.

In the next section, I describe the design and implementation of the Newark Smartphone Reentry Project. Section II focuses on the four issues discussed above, by drawing on findings from prior smartphone studies and by extending these concepts to hard-to-reach groups using data from the Newark project. Section III describes privacy concerns and research ethics with smartphones, and Section IV concludes by identifying specific questions that warrant further examination.

I. THE NEWARK SMARTPHONE REENTRY PROJECT

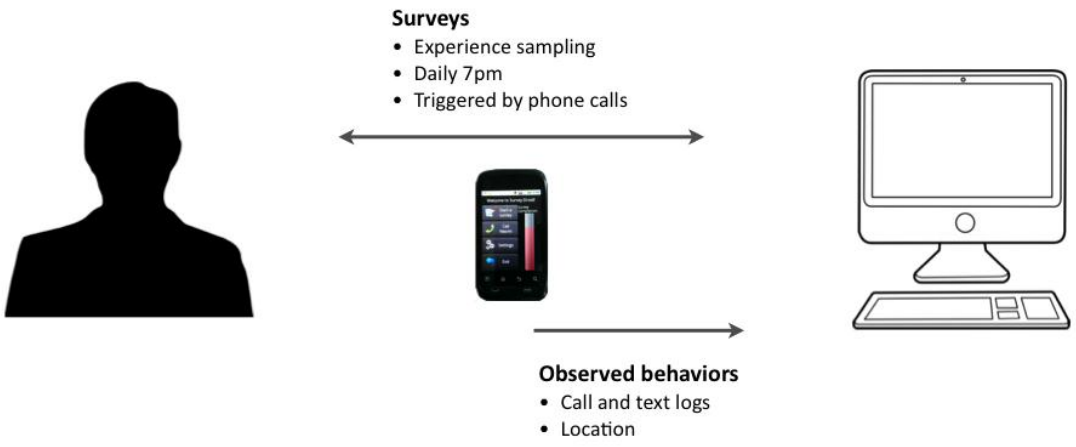
The Newark Smartphone Reentry Project (NSRP) focused on the job search and employment activities of men recently released from prison. Individuals that experience

incarceration are among the most disadvantaged groups in the United States. They typically have low rates of education attainment and employment, and are more likely to be urban, male, and African American or Latino (Western 2006; Pettit 2012). They also have high rates of mental health issues and chronic health conditions (Schnittker and John 2007), characteristic of groups that experience premature aging (Geronimus 1992). Nearly all of those that go to prison are eventually released. During this period of reentry individuals must find housing, employment, and reconnect with family and friends. The reentry experience is often unstable and individuals are typically quite poor with few resources to afford even basic essentials. For researchers, the reentry context exacerbates difficulties to longitudinally follow individuals that are already missed in conventional survey research (Pettit 2012). Because of this, longitudinal studies at reentry are costly (Bushway et al. 2007) and have low completion rates, about 40 to 55 percent of the original sample (Nelson et al. 1999; Visher et al. 2008). Although this context is an important backdrop for the findings reported in this paper, studying reentering individuals poses methodological challenges that are applicable to resource-poor, hard-to-reach groups more generally.

The NSRP focused specifically on the role of social contacts, geographic mobility, emotional wellbeing, and social support in job searching. Using an Android application that was created for the project,[16] I collected a wide array of observed behavioral measures and respondent-reported information (see Figure 5.1). Among the behavioral measures were indicators of social contacts, such as encrypted phone numbers from calls and text messages, and location mobility through GPS estimates. These were passively collected by the application and did not require any participant interaction. I also sent surveys twice a day that asked about daily

[16] The Survey Droid Android application is available to other researchers through the open-source code repository www.github.com.

Figure 5.1: NSRP data collection design



experiences. One survey was an experience sampling survey that was automatically sent at a random time between 9am and 6pm, in order to collect randomly sampled observations of daily daytime experiences. Another survey was sent at 7pm daily, which included more detailed questions about activities. In addition to these surveys, very short surveys were automatically triggered when participants received a call or a text message from a new phone number in order to collect information on social contacts. Once participants received a survey, they had one hour to complete it. To encourage survey completion, I paid participants a $15 bonus for completing at least 75 percent of surveys each week. Participants were able to control all of the data collection functions—surveys, encrypted phone numbers, and location information—from their phones. Participants also completed an in-person interview at the beginning of the project and a final interview at the end of the three months.

Participants were randomly selected from a complete census of eligible parolees released to Newark, New Jersey between April 2012 and April 2013. Parolees were eligible to participate if they were male, recently released from prison, searching for work, and neither gang identified nor convicted of a sex offense. Individuals were randomly assigned to either the smartphone

group, which participated via the smartphone application as described above, or the interview group, which participated in interviews every other week. Because this project was primarily intended to test data collection via smartphones, only twenty percent of eligible parolees were assigned to the interview group, and the findings were used to help assess the efficacy of collecting data from smartphones. Participants in both groups were offered comparable incentives and the interview group received smartphones at the end of the study. In total, 156 individuals participated in the project, including 135 smartphone and 21 interview participants.

Design and implementation issues

The design and implementation of smartphone studies can take many forms, depending on the project aims and study population. Some of the logistical issues that arise while designing a smartphone study are discussed in detail elsewhere, in the context of specific projects (Gaumer et al. 2014; Goldberg et al. 2014; Raento et al. 2009). Here, I highlight three issues that are specific to groups that are resource-poor, low-skill, or have less familiarity with new technologies.

The limitations of no-contract phones. In many smartphone studies, including the NSRP, researchers provide phones to participants. Although costly, there are many advantages to this approach. Providing phones and data plans ensures that participants have reliable cell phone access and that the smartphone application works as expected on the device's operating system. Purchasing phones through a no-contract, month-to-month provider may seem like the most attractive approach, since project designs often conflict with the terms of contract plans, month-to-month phones and plans are cheaper, and poor participants are better able to assume responsibility for the plans after the study. However, I found that the technological capabilities of no-contract phones were often substandard to the requirements of a data-intensive application.

These providers also typically offer very limited customer support services, which are particularly important when a project depends on access to the same phone model throughout the study period and when phones malfunction and need to be replaced.

Adjusting for varying skill levels of participants. In the NSRP, skill level and familiarity with smartphones ranged substantially, with some individuals released from prison after serving very long sentences and not familiar with the Internet or mobile devices. I adjusted for varying skill levels in two ways. First, I offered optional smartphone training sessions, which were conducted by the phone provider, to newly recruited participants. Second, the smartphone survey questions were designed to require relatively simple responses from the participant, such as checking a box on the screen or moving a sliding bar. One exception is that participants were asked open-ended questions about the most important positive and negative events of the day. For these questions, many participants used the voice translation feature on the phones, which allowed them to answer the question without needing to use the sometimes challenging touchscreen keyboard. In the NSRP, one smartphone participant (of 135 individuals) was unable to complete any smartphone surveys. This individual had serious mental health and memory issues, which impeded his ability to use the phone.

Reducing the potential for stolen and missing devices. One of the primary concerns while designing the NSPR was that participants would accidentally or intentionally lose their phones or that their devices would be stolen. To mitigate these concerns, the project's consent forms stated that missing devices would not be replaced and that stolen devices might require filing a police report. Of the 135 smartphone participants, three people (2 percent) reported their phones stolen during the study period. One person recovered his phone after offering to pay for it, and another person bought a new phone of the same model in order to continue participating

in the project. The third person was unable to recover his phone and was followed by researchers via interviews for the remaining months.

A related concern was that participants would enroll in the project for the sole purpose of obtaining a phone and would leave the study immediately after receiving the device. This concern appears to have been misplaced, since participants typically perceived the phone plans as more valuable than the devices themselves. One participant did leave the study after the first day; however, it is not clear that his original intention was to obtain the phone without further participation. Overall, missing and stolen devices were relatively minor issues for the NSRP.

II. STRENGTHS AND POTENTIAL CHALLENGES OF SMARTPHONES

Sample selection, attrition and participation

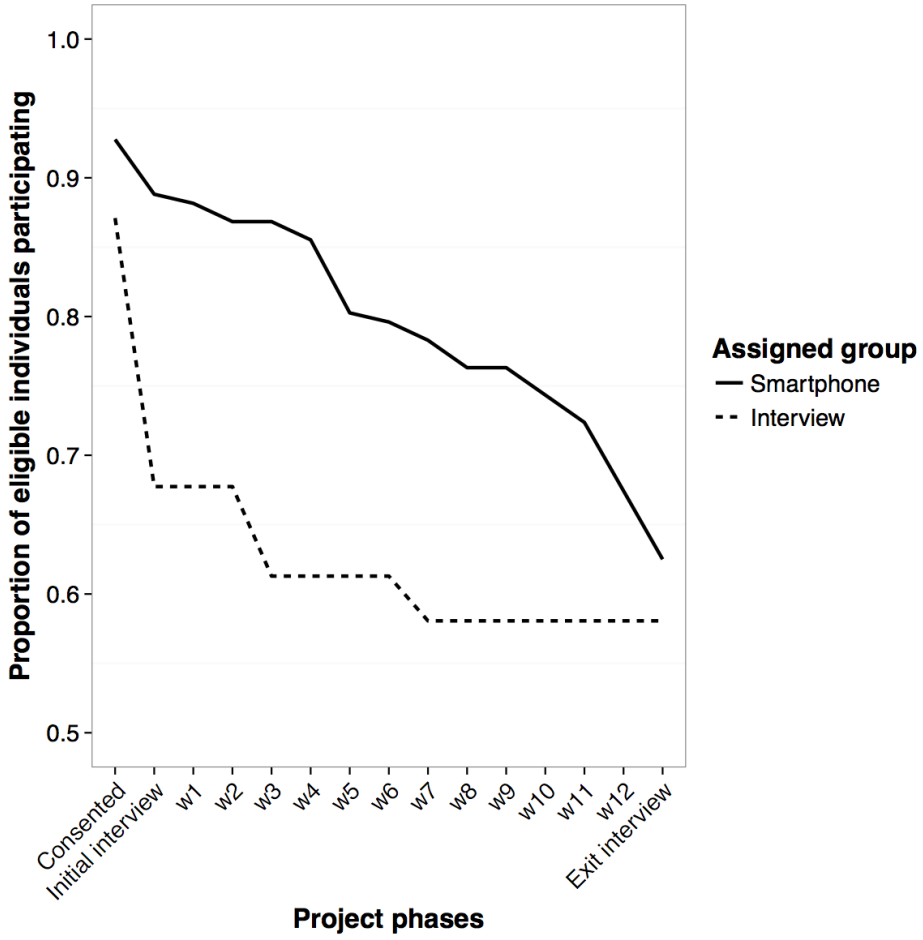
Researchers that study hard-to-reach and mobile groups are often concerned about the generalizability of their findings due to bias resulting from sample selection and attrition. Sample selection bias results from both the design of subject recruitment, which is largely controlled by the researchers and community partners, and the willingness of recruited individuals to participate. Individuals assigned to the smartphone group were offered smartphones and paid data plans at the start of their participation, and 93 percent of eligible individuals agreed to participate. Among those, 96 percent of the smartphone group completed the initial in-person interview, received the smartphone, and sent data to researchers from the phone. For comparison, 87 percent of the interview group agreed to participate and of those, 78 percent completed the initial in-person interview. Individuals who agreed to participate but did not complete the interview gave different explanations to the researcher, including finding work, not having transportation to travel to the interview, or not having the time to participate. Combining the rate of consent and actual participation, 89 percent of eligible smartphone

individuals participated compared to just 68 percent of interview individuals participated (see Figure 5.2). The incentive of receiving a phone and paid data plan enabled me to recruit a much higher proportion of the eligible sample, improving the generalizability of findings to the larger population under study.

The use of smartphones not only improved the initial participation rate but it also helped retain much of the sample for most of the three-month study period. Figure 5.2 describes the proportion of eligible individuals that participated throughout the project's phases. At the end of the first six weeks of the project, 80 percent of all eligible smartphone individuals were still participating in the project, compared to 61 percent of eligible interview individuals. Although the rate of participation among the smartphone individuals remained higher than the interview individuals throughout the project phases, the attrition rate is steeper among the smartphone group. The higher attrition rate among the smartphone group reflects the already-selected nature of the interview participants, who were typically more motivated to finish the project compared to the average smartphone participant. By the end of the project period, 63 percent of the smartphone individuals compared to 58 percent of interview individuals completed the final interview. It is important to emphasize that these completion rates are based on the total population of eligible individuals. Among those that participated in the initial interview, the completion rates for the smartphone and interview groups are 70 percent and 86 percent, respectively.

Compared to most other longitudinal projects of individuals after prison, the smartphone group had high participation and retention rates. For example, a month-long study of recently incarcerated individuals that administered weekly interviews had a 56 percent completion rate (Nelson et al. 1999). Another project interviewed reentering individuals once within three

Figure 5.2: Participation rate among smartphone and interview groups



months of release (66 percent retention rate) and once between four and eight months (42 percent of the original sample completed both follow-up interviews) (Visher and Kachnowski 2007). One exception to these comparably low retention rates is a recent Boston reentry study, which followed 122 individuals and used a variety of tracking techniques to achieve high response rates (93 percent) after 2 months (Western et al., *Working Paper).*[17] It is important to emphasize that

[17] The costs per participant associated with the Boston reentry study are comparable to the costs of the NSRP. Researchers with the Boston study devoted resources to tracking participants over time, in order to ensure high retention rates. They estimate costs of $200 to $250 per interview, including participant incentives and staff time for interviews and follow-up (Western and Sirois, personal communication). In the NSRP, the costs of phones, service plans, incentives, and a

the completion and retention rates for these other interview studies are based on the pool of individuals who had already agreed to participate and not on the number of total eligible individuals. Therefore, these participation and retention numbers understate actual differences compared to the NSRP. Because of the challenges of interviewing resource-poor individuals who have unpredictable schedules and commitments, providing smartphones and collecting information via phones enables researchers to more effectively follow traditionally hard-to-reach groups over many weeks and even months.

Participants in the smartphone group sent very detailed self-report information and observed behavioral data in real time through the phones. Although participants received many surveys, the survey length was typically very short and took less than a minute to finish, reducing the perceived burden of completing the surveys. Throughout the three-month study period, participants completed 25,033 of the 31,909 surveys sent to their phones (78 percent). This is an average of 185 completed surveys per participant. The proportion of surveys completed varies by participant, with most participants completing more than 75 percent of surveys received. Figure 5.3 displays a histogram of survey completion rates by participant. A small number of participants (14 of 135 participants, 10 percent) completed less than 50 percent of surveys received. The majority of participants (68 percent) completed at least 75 percent of surveys.

Participants' smartphones also passively sent 359,167 location estimates of the possible 412,704 collection times (or 87 percent coverage). Approximately 23,000 points, or 6 percent, were not collected because participants were in areas without GPS service or they had turned off

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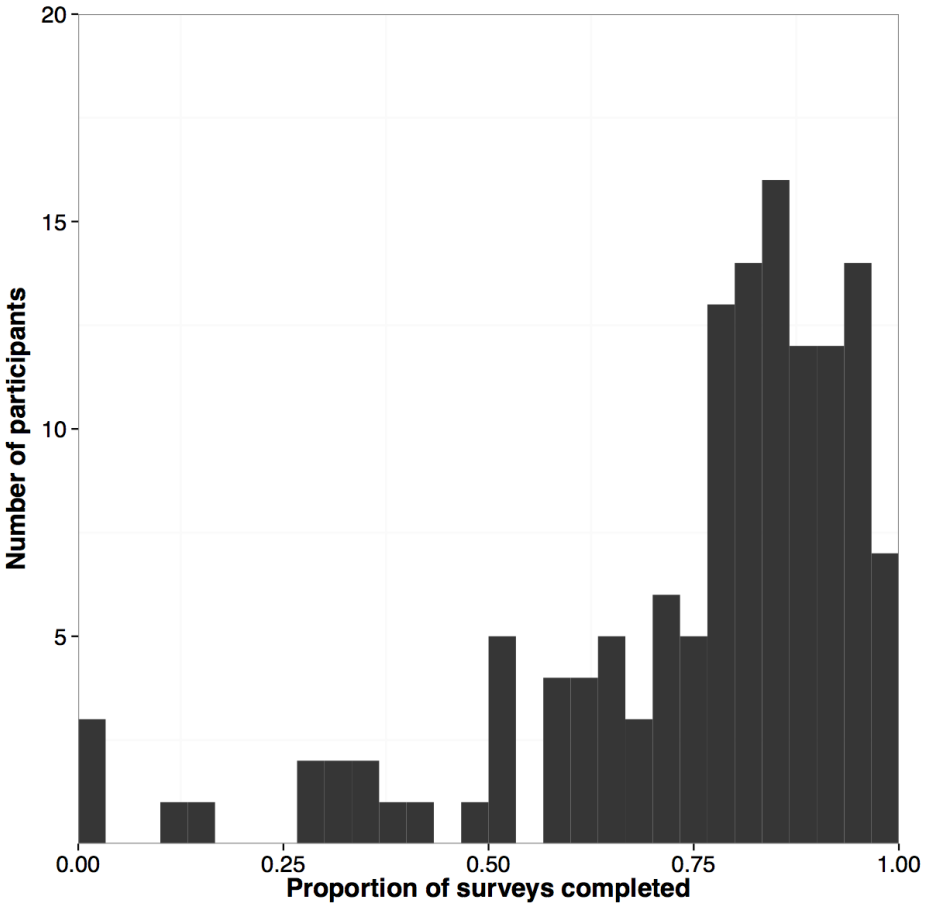
research assistant to monitor incoming data quality were approximately $230 to $410 per participant for a three month study period.

Figure 5.3: Smartphone survey completion rates by participant, n=135



their phone's master GPS controls.[18] An additional 30,381 points, or 7 percent, were not collected because participants turned off the collection from the project's application on their phones. I discuss the potential implications of thesemissing data in the data quality section below. The relatively high rate of coverage for surveys and location estimates suggests that

[18] Android platforms no longer allow user-installed applications to override the phone's overall GPS settings. Participants could turn off the GPS on their phone, as opposed to the GPS setting on the NSRP application. When asked about why their phone's GPS was off, participants offered a variety of reasons, including that they did not realize it, that they turned it off to conserve battery life, or that they did not want others, meaning the government or phone companies, to track their movements.

participants are willing to complete surveys on their own and allow the collection of behavioral measures, even when they have relatively little contact with the researcher.

The comparably high participation and completion rates among smartphone participants suggest that individuals are quite amenable to smartphone data collection methods. In the final interview, I asked participants whether they preferred sending information through the phones or would rather participate in weekly interviews. Of the smartphone participants who completed the final interview, two-thirds stated that they prefer smartphone surveys to interviews (see Table 5.1). Approximately one-fifth of participants thought that weekly interviews would be more helpful, and 13 percent said they did not know or had no preference. Interestingly, there were no differences by age, previous smartphone ownership, or initial comfort with smartphones as self-reported at the beginning of the project.

The most common reason for preferring smartphones was convenience, with 35 of the 63 participants stating that filling out surveys via phones was less burdensome than interviews. As one participant said, "Because you don't have to travel and after a long day of walking around, going to businesses, you don't want to come in [for the interview]." Another participant emphasized the benefit of not needing to travel: "because it's convenient—you can do it where you're at and you don't have to go nowhere and keep appointments." The ability to fill out surveys and still be doing other activities was echoed by others. As stated by one participant, "Because I can be doing something else and still answering the questions on the phone." Participants who were working also emphasized convenience in terms of being able to work and still fill out the surveys. Only one person mentioned that having the phone itself was a benefit. Even though most participants did not directly describe the smartphones as incentives, the higher

Table 5.1: Preference for smartphone surveys or weekly interviews, n=95

	Smartphone surveys	Weekly interviews	Don't know	Total
Number of individuals	63	20	12	95
Percent of individuals	66	21	13	100

participation and retention rates suggest that it was an important motivator for participating in the project.

Although a small minority, some participants stated that they thought frequent interviews would be less private (n=3), harassing (n=5), or uncomfortable (n=3). As one participant stated, "I'm not really good in person, I'm not a people-person. I can deal with the phone. I wouldn't want to discuss with the person what I type on the phone." Several participants stated that "just knowing you have to go to an interview" or that "being in someone's office" was stressful. One person even perceived the interviews as being patronizing, as opposed to having the phone: "Because you want the [participant] to feel more like a grown up than a child and when you first come home, you don't want people over you." An additional person stated that he simply "wouldn't go to the interview." The reluctance to participate in interviews is likely a greater concern among this population, as opposed to university students or faculty, where meetings and interviews are more commonplace.

Despite these negative assessments of interviews, 21 percent of smartphone participants stated that they preferred interviews to smartphone surveys. These respondents discussed the interview as providing more feedback and being more personal compared to filling out surveys via phones. As one participant said, "face-to-face you get more intimate with the conversation. With the phone, you just answer the questions and throw it back in your pocket—it's a yes or no question. But if you are in an interview, the interviewer could give us feedback." Another

participant stated, "because I don't like talking to machines," and a third said "because it's better when you have human interactions…surveys are really impersonal." Other participants in favor of interviews said that they could discuss their issues more in-depth; as one person stated, "I might be able to explain a bit better than going through the cell phone." These responses suggest that these participants would prefer in-depth and open-ended interviews as compared to smartphone surveys; however, they may not prefer more structured interviews.

As the findings from this section suggest, smartphones have the potential to improve sample selection and attrition while providing researchers with a relatively high level of participation through surveys and observed behavioral measures. At the same time, surveys via phones are relatively brief and often cannot explore complex events and situations in detail with participants. For projects that aim to study irregular patterns and experiences using frequent data collection methods and that also require in-depth exploration of specific issues and contexts, smartphone methods might be usefully complemented with periodic interviews.

Measurement of detailed, irregular, and changeable patterns

Interviewing methods often confront challenges when trying to measure concepts that are difficult for respondents to accurately estimate or to retrospectively report without recall bias. The use of smartphones for data collection can improve upon the shortcomings of traditional approaches, by collecting real-time observed behaviors and self-reported answers while individuals are in their everyday environments.

Observed behaviors. Social scientists are often interested in concepts that are difficult to self-report and error-prone to calculate. For example, researchers may want to measure an individual's social network, their geographic segregation, or even their physical exercise. These concepts may be particularly challenging to estimate for highly mobile individuals with irregular

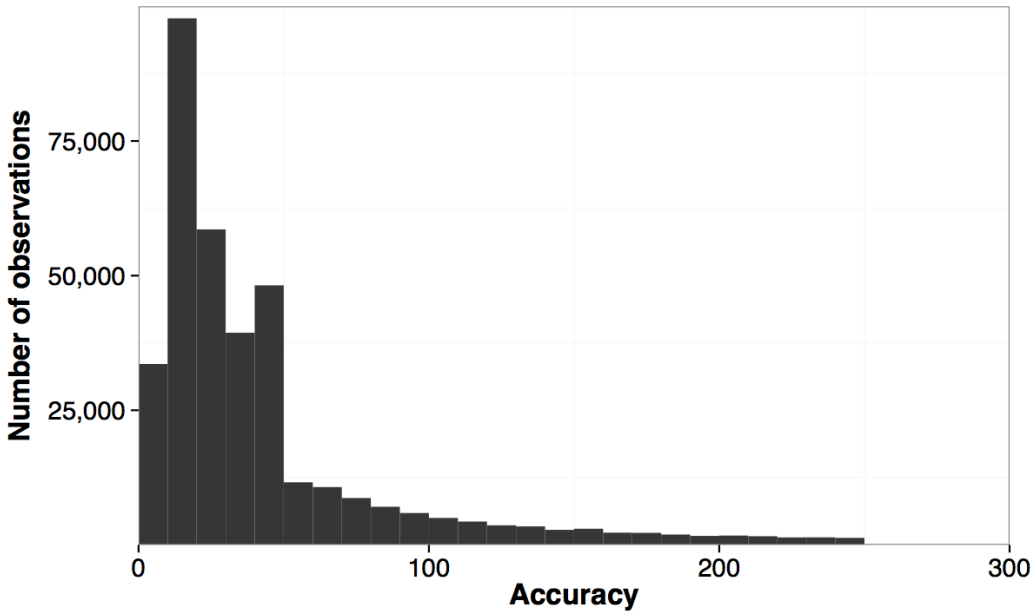
schedules and patterns. Data collection applications installed on smartphones can passively collect observed behavioral measures that provide information about these concepts, such as social contact information from call and text logs (Miritello, Moro, et al. 2013; Jukka-Pekka Onnela et al. 2007; Raento et al. 2009), mobility information from GPS coordinates (Gaumer et al. 2014; Palmer et al. 2013), and physical health measures from heart rate and pedometer data (Gaggioli et al. 2011). In the NSRP, I collected GPS coordinates and phone call and text logs, and I discuss the advantages and potential challenges of using these data to assess concepts of social networks and geographic mobility.

Geographic locations. Spatial mobility in everyday life is difficult, if not impossible, to measure using traditional methodologies. Studies on neighborhood effects or spatial context normally rely on residential address at a particular moment in time; however, this static measure does not provide a full picture of spatial contexts and isolation. In the NSRP, the smartphone application passively collected location estimates every 15 minutes during daytime hours. The collection of these frequent and observed behavioral measures reveals a much larger geographic world than suggested by residential addresses alone. The NSRP participants lived in a total of 129 unique census blocks but they traveled through a total of 10,215 blocks. Location information is able to capture information on mobility patterns that is simply not possible with other methods.

One concern with location estimates is that the accuracy range can be quite variable (Palmer et al. 2013; Raento et al. 2009); however, this appears to be quickly improving as technology advances. In fact, the accuracy for this project is measurably better relative to research studies conducted in the recent past. In the NSRP, the mean accuracy for location estimates is 44 meters compared to 311 meters from a study conducted just 2.5 years prior

(Palmer et al. 2013). Although the majority of location estimates do not have the accuracy to identify a participant's location in a particular building, 75 percent of estimates have a range of 48 meters or less (which equals about one-third of a mile, see Figure 5.4). For most research questions, this level of granularity on everyday spatial mobility is more than adequate.

Figure 5.4: Distribution of accuracy estimates for locations, n=359,167



Note: accuracy refers to the number of meters that fall within the 95 percent confidence interval for the point estimate.

Call and text logs. The measurement of social networks and contacts based on self-report techniques is particularly challenging (Bernard et al. 1984; Feld and Carter 2002; Marsden 1990, 2003). Estimating these concepts using phone call numbers provides a behavior-based alternative to self-report measures, where the number of unique phone numbers represents social network size and the duration of phone call communication reflects social interaction (Miritello, Lara, et al. 2013; Miritello, Moro, et al. 2013; Onnela et al. 2007; 2007b). In the NSRP, I collected encrypted phone numbers from calls and texts in order to measure network size, as well

as other characteristics of communication, such as duration and regularity of contact. Encrypting the phone numbers protected participants' privacy while allowing me to distinguish between new and old numbers. In collecting the encrypted numbers, I did not encounter any known technical issues that would have prevented the consistent collection of information. However, over the study period, 35 of the 135 smartphone participants (26 percent) turned off the collection of phone and text log data at some point. On average, these participants turned off the function 2.3 times and kept it off for 19.6 hours each period, for a total of 45 hours of disabled time, on average, for the 35 participants over the study period. The implications of these missing data are discussed in the data quality section below.

The collection of detailed phone records to estimate social network size and communication characteristics is a major improvement to existing approaches that rely on self-reported methods. At the same time, there are several issues that complicate the use call and text logs as measures of social contacts. First, and most obviously, call and text logs measure one dimension of phone-based social interaction. This limitation can be addressed by the use of experience sampling surveys that ask about in-person social contact. A second issue is that phone usage patterns may skew estimates of social networks. Although there is no information on the number of phones owned by individuals, people commonly have several phone numbers, including business, personal, and home landlines. Research that analyzes call log data from cell phones may miss particular social networks, such as calls placed from home landlines to personal, non-business contacts.

Phone usage patterns among resource-poor groups may be particularly challenging to address. It may be common for individuals to lend their phones to others, use several phones for different purposes, or frequently change phones and phone numbers. Among those that lack

credit history or the resources to purchase a contract plan, individuals may use temporary pre-paid phones, switch carriers and phone numbers, or borrow phones from others. Individuals that engage in illicit or deviant behavior may also use separate phones to protect their anonymity. What are the implications of these patterns? First, measures that rely on phone numbers to estimate the size of social networks may be actually measuring segmented networks—for example, business networks on company phones or family networks on personal phones. Second, phone call and text logs may be capturing the user's network as well as the network of friends or family who borrow their phone. Third, multiple phone ownership by a participant's contact may lead to an overestimation of true network size.

In the NSRP, I tried to address the latter two concerns by analyzing only reciprocal phone numbers and by sending surveys after the receipt of a call or text from a new number. Limiting the call logs to reciprocal phone numbers, or phone numbers with completed incoming and outgoing calls, follows methods in other scholarship (Onnela et al. 2007; 2007b) and aims to exclude businesses, wrong numbers, and tangential contacts that may result from phone borrowing or temporary phone ownership. In the NSRP, the majority of phone numbers are not reciprocal (or 63 percent of calls). Although this is a high percent, it is lower than another smartphone study that followed university students and faculty, where 76 percent of phone numbers were not reciprocal (Eagle and Pentland 2006).

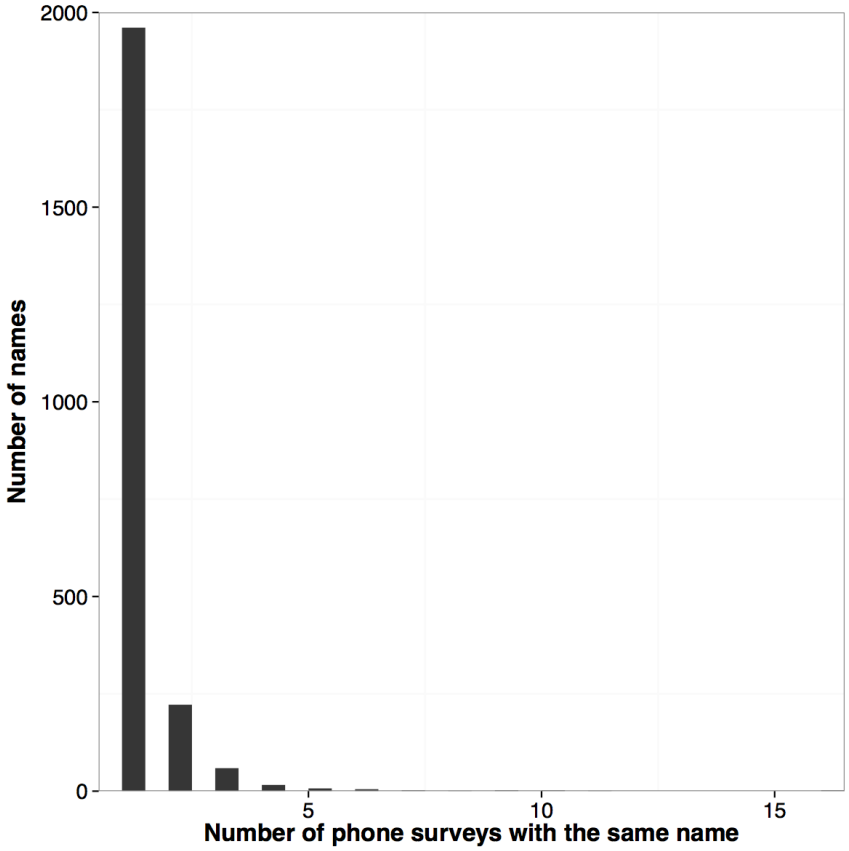
In addition to excluding non-reciprocal phone numbers, I sent very brief, automated smartphone surveys, which were triggered when a participant received a call or text message from a new, unique phone number. To help estimate the extent of multiple phone numbers among the friends and family members of participants, participants were asked to type in the first name of the contact, if it was not already stated in the initial interview. Analyzing the first

names of contacts reveals that a very small proportion of names were repeated more than two times per participant. As Figure 5.5 describes, about four percent (or n=97) of the 2,345 unique names among participants were repeated more than two times. There were a small number of names (n=5) across five different participants that were repeated ten times or more. Because this analysis is based on first names only, the repetition of names could reflect either common given names of several different people or different phone numbers associated with participants' contacts. Although I am unable to distinguish between these two scenarios, the small number of repeated names, as well as the examination of reciprocal phone numbers above, suggests that phone sharing and multiple phone ownership among disadvantaged and hard-to-reach groups may not be as widespread and common as researchers presume; at the same time, future research that examines this issue would be valuable.

Real-time collection of information. Measurement of temporary states or events that are often in flux is a particular challenge for traditional interviewing methods. The ability to send surveys to participants in real time, while individuals are in their everyday environments and routines is an important advantage of smartphones for certain research questions. Because of this, researchers who use experience-sampling methods[19] to study temporal experiences in real time have been at the forefront of incorporating smartphones into their studies. These researchers have utilized smartphones to collect self-report answers and/or visual information (e.g., photos) at random intervals to study a variety of issues, ranging from simple description of everyday experiences (Hulkko et al. 2004; Raento et al. 2009) to children's play (Plowman

[19] Participants are asked to record temporal events or feelings at different time intervals, which can be randomly selected, scheduled at defined moments, or dependent on the occurrence of specific events (see Stone et al. 2007).

Figure 5.5: Number of names from incoming calls to participants



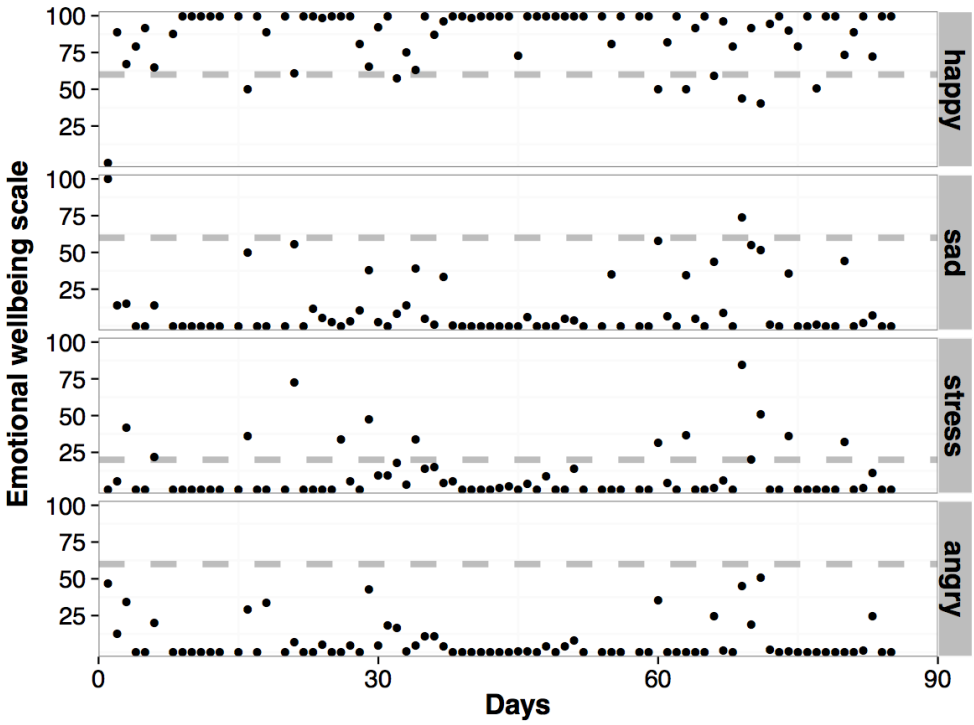
Notes: this figure is based on smartphone survey answers from participants, where surveys were automatically triggered after the participant received a call or text message from a new, unique phone number. The y-axis describes the number of names of contacts and the x-axis describes the number of times the name was listed on a participant's phone survey, which indicates that the phone number is associated with several people of the same first name or the same person that has several different phone numbers. Very few names are listed more than one time, indicating that individuals have few contacts that share the same first name and few contacts that call participants from several different phone numbers.

and Stevenson 2012) to mental health and emotional wellbeing (Gaggioli et al. 2011; Killingsworth and Gilbert 2010; Palmer et al. 2013).

In the NSRP, a primary research aim was to assess the role of emotional wellbeing for job search persistence. Since emotional wellbeing is variable and affected by interview settings, it was very important to collect wellbeing reports in real time and in non-research contexts. The frequently collected reports of wellbeing in everyday environments provide a more reliable

portrait of mental health compared to single-point estimates in an interview setting. Figure 5.6 displays real-time reports of happiness, sadness, stress, and anger, as compared to answers in the initial interview, for one randomly selected participant that completed the project. The real-time reports indicate substantial variability in emotional wellbeing throughout the 90-day study period. The patterns observed in the real-time reports suggest that the initial interview answers underestimate feelings of happiness and overestimate feelings of anger, sadness, and stress. There are also several peaks in sadness, stress, and anger that occur throughout the period, which are simply not captured with single-point estimates.

Figure 5.6: Emotional wellbeing reports, at initial interview and via smartphone surveys for one participant



Notes: the points reflect survey answers received from one participant throughout the study period. The gray dashed lines represent the level of emotional wellbeing reported at the initial interview.

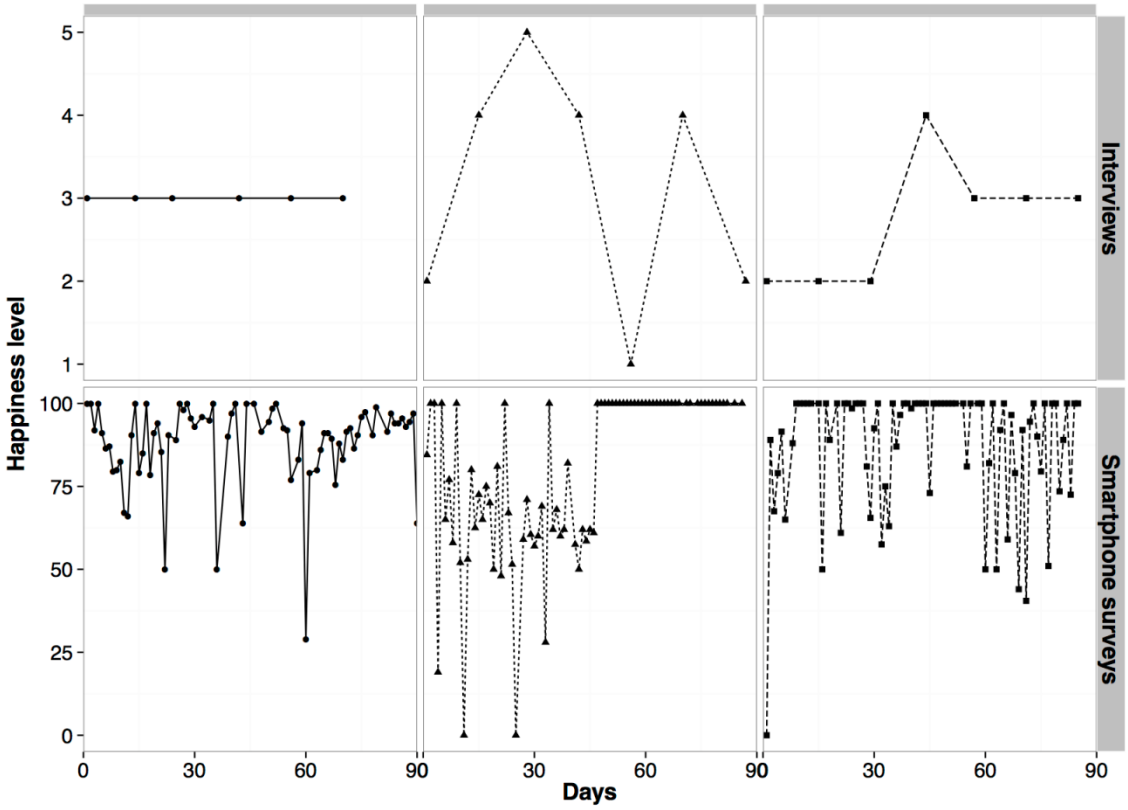
The finely grained, detailed smartphone measures also afford a better understanding of both variation and regularity of emotional wellbeing compared to frequent interviews. Figure 5.7 displays reports of happiness from interviews conducted every other week and from daily smartphone surveys for three randomly selected interview and smartphone participants that completed the project. As the figure shows, the frequency of reports provided by the smartphone surveys captures highs and lows in wellbeing, while also establishing patterns of long-term trajectories. Based on the interview reports (top row, Figure 5.7), emotional wellbeing appears comparably stable for the left and right participants, but it is quite variable for the participant described in the middle column. For this participant, more frequent measures of happiness would help better place his emotional swings within the context of his overall emotional state.

For research that depends on measuring irregular events or experiences, smartphones can enable the collection of real-time self-reports that may not be adequately assessed through traditional data collection methods. The frequent and detailed measures potentially enable researchers to estimate with better precision triggering events that are associated with fluctuations in wellbeing, or other transitory states of interest.

Data quality and missing data

Smartphone data collection designs involve many hundreds, and oftentimes tens of thousands, of data points per study participant. This approach leads to a wealth of detailed information, as the previous section has described. At the same time, it also means that researchers will often confront high levels of missing data at any one time for a participant. Previous literature has discussed the implications of missing data for analytic methods (Stone et al. 2007; Walls and Schafer 2005) and concerns about missing data due to technological bugs,

Figure 5.7: Happiness from interviews every other week and daily smartphone surveys



Notes: the figures describe data from three randomly chosen interview participants and three randomly chosen smartphone participants. Interview participants were asked to rate how happy they felt on a 5-point scale. Smartphone participants were asked to rate their happiness by selecting a point on a 0 to 100 point scale on their phone. The smartphone data provide fine-grained reports that reveal highs and lows of wellbeing, as well long-term trends of happiness.

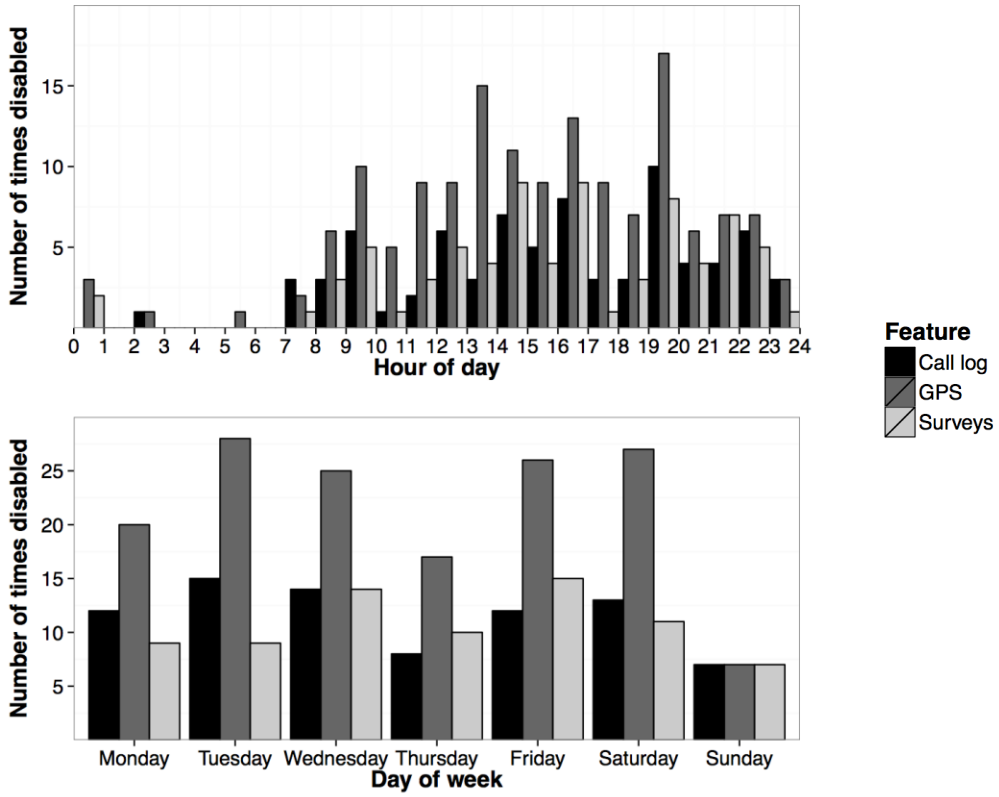
battery life, or when participants accidentally leave behind phones for brief periods of time (Raento et al. 2009). Although there are fewer missing data issues related to battery life as technology improves, highly mobile groups may still have problems keeping their phones adequately charged. In the case of one participant, his phone was stolen while charging it in the living room of a friend's house.

In this section, I discuss issues of missing data in the NSRP and the implications of non-random missing data. Because NSRP participants were men under parole supervision, I was concerned that some participants might intentionally and systematically choose to leave their

phones at home when engaged in particular activities. For example, individuals who violate parole requirements by traveling out of the state might leave behind their phones, resulting in erroneous conclusions about geographic mobility patterns, call log patterns, and survey answers during these times. These concerns may have been premature, as I received a high percent of location estimates (87 percent of the coverage time) and the location data reveal that participants often traveled out of state with their phones.

In order to discourage participants from leaving behind their phones out of privacy concerns, I included controls from their smartphones that managed the collection of survey answers, call logs, and location estimates. I monitored the use of these controls, enabling me to determine when participants felt uncomfortable with sending information. Figure 5.8 describes the times and days that participants turned off their call log, location, and survey functions. One might expect that participants would disable features on the weekends or in the evenings when they wanted privacy; however, participants were equally likely to turn off features during the day and during the week. In fact, very few status changes were made on Sunday. In total, 63 of the 135 participants (47 percent) disabled at least one function during the study period. The distribution across participants is highly skewed, with most participants disabling a few functions and a handful of participants frequently changing statuses. For example, one participant turned off his phone's functions 57 times over the study period. This individual participated in the project over the entire three months but did not participate in the final interview, so I was unable to ask him about his reasons for disabling functions. Notwithstanding a few active participants, missing data due to status changes accounted for a relatively small number of estimates (7 percent) for the function that was most often disabled (location).

Figure 5.8: Disabled data collection functions by participants, by hour of day and day of the week



Researcher effects and smartphone interventions

As the above sections described, collecting information via smartphones can occur passively, with data collection applications running in the background, or interactively, with surveys sent to participants. In some studies, as with the NSRP, participants receive smartphones as part of the research design. All of these design components may change participants' behaviors, a situation known as researcher effects or the "Hawthorne effect." Biases can occur whenever participants modify their activities, conduct, or beliefs exclusively because of their position as research subjects under observation. Participants who receive smartphones as part of the study design may change their normal routines by focusing their time and energy on learning the new device. Depending on the novelty of the smartphone (e.g., basic

Android phone as opposed to the newest iPhone) and the study population, participants may not adjust back to their normal routines for two weeks (Raento et al. 2009) or up to three months (Bodker et al. 2010). In the case of reentering individuals, changes in patterns due to receiving a phone may be less consequential since acquiring a new phone is often a normal part of reentry for most individuals. However, the provision of a smartphone, as opposed to a basic mobile phone, and a paid data plan may have temporarily changed phone usage patterns or encouraged greater communication. Among the NSRP participants, 53 percent had never previously owned a smartphone and two percent had never previously owned a mobile phone.

The frequent communication via smartphone surveys may also unintentionally create Hawthorne biases. Survey questions often ask participants to reflect on their prior experiences, current circumstances, or future expectations. While the simple questioning of participants in interviews may present biases, the frequency of smartphone surveys might change behaviors in more consequential ways. In the NSRP, participants that completed the final interview were asked whether they thought the project changed how they searched for work at reentry. The majority of participants (58 percent) answered affirmatively and nearly half of those stated that simply filling out the surveys motivated them to search for work. Participants discussed feeling the need to put something positive on the surveys, which encouraged them to search. As one participant stated, "[The project] helped me be determined to find a job and the things with the surveys helped me by asking me the questions. When it comes, I can see whether I can get me an interview or fill out applications because I know a survey is coming up. It kept me on my feet, it kept me aware." Others explained that the surveys offered them a method to document and think about their progress. As stated by one participant, "It helped me keep track of what I was doing, through the surveys. And if I went to an interview, I would need to check in and

keep me on track. It keeps me focused and attuned to yourself, with how you're feeling everyday and time to reflect." Another said, "They surveys made me refresh my day and I tried to make mental notes about where I was at and what my plan was—it helped me keep on top of myself."

Despite participant's statements, however, the likelihood of actual changed behavior for the outcomes of interest is not clear. Compared to individuals in the interview group, participants in the smartphone group spent more time searching for work. However, individuals in the interview group spent more days working. The differences in days spent searching between the smartphone and interview groups is likely a reflection of the much lower rates of working among the smartphone group and the more selected, motivated sample of interview participants. Because of differences in the participation rate of smartphone and interview individuals, it is difficult to differentiate variations in searching due to sample selection as opposed to researcher effects. This would be a fruitful area for future research.

Smartphone-based interventions. Although smartphone surveys have been discussed primarily as data collection tools in social science research (Gaggioli et al. 2011; Plowman and Stevenson 2012; Raento et al. 2009), the frequent administration of surveys has the potential to create unintentional behavior modifications. These potential changes in attitudes or behaviors may not necessarily be averse to social scientists; they might be instead positively leveraged as experimental interventions, as other disciplines have already done. Medical researchers and health care providers are forerunners in utilizing mobile phones and smartphones as interventions to improve health and wellbeing. Text-based program interventions, such as text4baby and smokefreetxt, are designed to provide real-time information, encouragement, and advice to improve outcomes like prenatal health and smoking cessation. Researchers have also proposed

that smartphones can improve traditional approaches to psychotherapy by using photos to document patient progress (Eonta et al. 2011).

As devices whose primary functions facilitate social interaction and communication, smartphones are particularly well-suited to experimentally test sociological questions of social networks, peer-based support, and social interaction. One can imagine sociologically-informed interventions that expand an individual's number of social contacts, networking strategies, or information sharing by randomly varying the amount, type, or context of social contact information sent. Alternatively, smartphones could experimentally test correlates of spatial mobility and isolation by randomly assigning participants to receive different types of geographic information, including directions to specific locales or job leads in particular neighborhoods.

In the NSRP, half of the smartphone participants were randomly assigned to a peer-based text-messaging forum that connected participants with each other. Through this group messaging application, I sent daily information on job leads and participants could respond to the group with new information, with clarifying questions, or simply to discuss recent events. The other smartphone participants received the same information from me, through individual text messages. The intention of the experiment was to expand the social networks of participants, by connecting them to other individuals in similar situations of being recently released from prison and searching for work.

Findings from the experiment suggest that connecting participants to other peers through a text-messaging group may provide an important source of information and social support. The most common text messages from participants concerned information about job openings or possible job leads. Individuals also shared encouraging or motivating words to other

participants, who had posted updates about specific jobs or about job searching progress. Individuals who were assigned to the peer-based forum reported higher levels of emotional wellbeing and spent a greater proportion of days searching for work and working. Interestingly, individuals in the peer forum spent less time on the phone communicating with other personal contacts, suggesting that assignment to the peer-based group took the place of communication that would have normally occurred. The differences in outcomes were not statistically significant at the 95 percent level using a two-tailed test, which might be due to the small sample. Despite this important caveat, the findings point to the potential benefits of social or peer-based experiments via smartphones.

Privacy and ethics

The detailed, frequent, and sensitive types of data that can be collected via smartphones are important concerns for research ethics and privacy. The passive collection of behavioral information may be easily ignorable by participants over time, which is an advantage for concerns about researcher effects, but is worrisome if participants forget that information they wish to keep private is being collected. For hard-to-reach groups, concerns about privacy, monitoring, or surveillance might be particularly relevant. Those that frequently experience negative interactions with government, such as welfare recipients (Bruch, et al. 2010), formerly incarcerated individuals (Weaver and Lerman 2010), or men with warrants (Goffman 2009), may be particularly hesitant to participate in smartphone-based studies due to concerns about privacy, government tracking, and surveillance.

Findings from the NSRP suggest that most participants are relatively amenable to the collection of detailed location information and limited call and text information under certain conditions. As mentioned earlier, some participants even felt that answering questions via

smartphones provided greater privacy than an interview setting. Moreover, because participants had control over their data collection functions, they could easily turn on and off the collection of information and look up their status from their application's homepage. With this control, participants could choose when and how they participate, and they could control their participation without needing to explain anything to the researcher (unlike interview or lab settings, which can be coercive in this respect; see Nosek, et al. 2002).

Information collected via smartphones is frequent and detailed and the implications of these features do not mean that there is simply more anonymous data on participants compared to traditional research designs. Rather, the detailed nature of information increases the likelihood of identification (Ohm 2009). The risk is especially high if a person has outside information about a participant but identification can also occur due to the uniqueness of the data patterns themselves. For example, there may be only a handful of people who travel the same geographic route at certain hours and on particular days.

Because of this vulnerability with high-frequency data, combined with the position of study participants as men under parole supervision, I took several approaches to protect participant privacy. First, the consent process involved a lengthy and comprehensive meeting with potential participants. Lasting anywhere from one to two hours, the meeting described all of the different types of data to be collected and the format of each measure. Potential participants were encouraged to ask questions throughout the meeting, and the group-based discussion was thorough and important for establishing trust and rapport with the participants. Second, the collected data were encrypted throughout all stages of the process—from storage on participants' phones to transmittal to researchers. Third, the website and server used for transmittal were secured with several layers of protection, including user passwords and a SSL

(Secure Sockets Layer) protocol. Fourth, information on the website was removed at frequent intervals throughout the data collection phase and transferred to a stand-alone server, which was maintained by the university. Fifth, I obtained a Certificate of Confidentiality from the federal government as an additional safeguard from forced disclosure.

In addition to the above procedures, I took special care with collecting the phone numbers of participant's contacts. Unlike the location data and survey answers, phone numbers describe information about people who have not consented to participate in the project. In this regard, they are particularly sensitive forms of data that need additional safeguards. As mentioned in the above section, the phone numbers of phone calls and text messages were encrypted. To do this, an encryption code was randomly generated when the software application was downloaded onto a participant's phone, and it scrambled the phone numbers using the encryption key on the phone prior to transmitting the information to the server. Using this approach, each participant's set of contacts was encrypted with a separate code, which was unknowable to the research team.

To the author's knowledge, there are no privacy and confidentiality guidelines regarding the collection of smartphone data or high-frequency data more generally. When designing a smartphone study, researchers should not solely depend on their organization's Institutional Review Board, as these committees may not be fully aware of the potential risks of disclosure with high-frequency data. While there is a need for formal guidelines that are produced through collaborative discussions of interdisciplinary researchers and potential study participants, I provide here several objectives that guided the development of the NSRP:

Clearly communicate with participants. Take time to describe the project aims, the data to be collected, the potential security concerns, and the approaches taken to help address

potential risks. Use language and terminology that is accessible to participants, particularly those that may not be familiar with the Internet and new technologies.

Collect information that is necessary for the project and no more. Smartphone applications can often easily collect a broad array of additional information that is not relevant to the project's primary objectives. Because of the unique concerns of highly detailed information, the benefits of collecting additional information that is technological feasible but conceptually tangential to the project aims may not justify the increased risks of disclosure.

Utilize new and traditional privacy approaches. There are many security approaches that smartphone studies should always employ, such as encrypting information on the phones, removing the encrypted information after transmittal to researchers, and ensuring that the website-hosted server is private and secure. Since advances in technology security are evolving, social scientists should seek out computer scientists and other experts with updated information on current best practices. At the same time, techniques used in traditional studies to protect participant privacy are oftentimes the most effective in practice. These include strong user-specific passwords for phones, websites, and databases, and the separate storage of different data types in password-protected folders.

IV. DISCUSSION

In this paper, I described advantages and potential challenges of utilizing smartphones for data collection. Smartphones are able to collect detailed behavioral and self-report measures that are simply not available with traditional research methods. Researchers studying hard-to-reach populations may find smartphones particularly advantageous for improving sample selection and participation. However, as with any new method, researchers must consider the potential concerns and biases that affect smartphone data collection efforts. Although current social

science research using phones is relatively limited, these concerns should be at the forefront as smartphone studies become more common. The discussion of potential challenges is not meant to dissuade researchers from incorporating smartphones into their data collection strategies. Rather, the aim is to highlight areas of particular focus for future smartphone projects.

Given the potential concerns and biases described here, how can researchers capitalize on the many advantages of smartphones? I suggest that social scientists adopt an approach that characterizes good data collection methods more generally—both new and traditional—by using a triangulation of methods. Triangulation, or the use of different measures, data collection approaches, or vantage points to understand a concept, is a feature of robust quantitative, qualitative, (Singleton, Jr and Straits 2009) and ethnographic research (Duneier 2011). Data collection using smartphones should not be any different. Researchers that are familiar with the flaws of retrospective self-report measures may find it tempting to view observed behavioral measures as the gold standard that need no other checks. Yet, these measures reflect phone usage, and it is only assumed that participants use the phones in ways the researcher expects. Smartphone-based methods provide researchers with observed behavioral information and self-reported answers; researchers can take advantage of these different measures to analyze internal consistency of measures. Given that smartphone methods are new and relatively untested, I suggest that researchers incorporate several approaches to help assess the biases of each method and to use checks for internal consistency whenever possible.

With care, social scientists should readily adopt new technologies when warranted by the research question and population under study. Traditional research methods suffer from a multitude of biases and errors that we often overlook; smartphones offer a potentially valuable approach to help remedy many of these concerns. Not only can the use of smartphones improve

the accuracy and reliability of retrospective, self-report measures and help researchers follow hard-to-reach groups, they also expand the types of research questions that can be studied. For example, smartphones can be used to map social networks of peers to better understand the frequency, type, and duration of contacts. Smartphones can be used to analyze the spatial patterns of different individuals—perhaps distinguishing by social class or race—as they move through their daily lives. Research on neighborhoods and spatial contexts no longer must rely on single, static measures of residential address, but could instead directly measure the geographic mobility of individuals throughout the day (Palmer et al. 2013).

This paper identified several potential challenges related to smartphones as data collection tools. I suggest that future research focuses on two issues that are particularly important to projects with disadvantaged and hard-to-reach groups but are also applicable to general populations. First, participants may feel increasingly protective of their privacy and confidentiality as more information becomes digital. Although some participants in the project turned off the collection of information several times throughout the study period, there was no clear pattern that explained the status changes. A substantial number of participants also felt comfortable enough sharing their data that they even traveled out of state, violating their parole requirements. A better understanding of the reasons and circumstances for feelings of discomfort with data collection and monitoring will help assess selection bias and will encourage the design of future collection efforts that address these concerns. Second, the prevalence and reasons for multiple phone ownership, phone sharing, and phone hopping should be further examined. We currently lack basic information on the number of phones an average individual owns and how often they change phones. Understanding the scope of this potential issue is needed before we

can confidently interpret smartphone data as sufficiently comprehensive reflections of the social world.

Chapter 6. Conclusions

This dissertation used a novel methodological approach to provide new insights into the job searching and employment experiences of individuals after prison. Despite the importance of better understanding employment at reentry, there is limited empirical work on the subject. This is not for lack of trying; rather, methodological difficulties have prevented the detailed, longitudinal tracking studies needed to thoroughly investigate a population that is largely missing from administrative records (Pettit 2012) and cost-prohibitive to follow using conventional methods (Bushway et al. 2007).

Using smartphones as data collection tools, the findings presented here describe a reentry period characterized by irregular, uncertain, and poor employment opportunities. Although most individuals find some work over the three months, it is very sporadic and precarious. The majority of individuals limit their job searching activities after the first month, whereas a smaller minority consistency searches over the entire study period. This latter group is particularly disadvantaged; they are older, have higher rates of shelter residence, and have lower levels of perceived social support. For the individuals that find work relatively quickly, their wages are typically very low and the majority of jobs is off the books, offering little security, satisfaction, or future prospects for self-sufficiency.

Chapters three and four examined two explanations for poor employment outcomes—low social connectivity and low emotional wellbeing about searching. Both chapters found evidence contrary to the dominant narratives in reentry scholarship, in that individuals are not poorly socially connected and are not overly distressed by their job searching experiences. Rather, reentering individuals have relatively large social networks and use their contacts to find work at comparable levels of other jobseekers. They are also happier on the days that they search for

work, and lower levels of happiness with job searching predict greater probabilities of searching the following day. This happiness is short-lived, however, and individuals report lower levels of emotional wellbeing on the day following search.

Although findings from these two chapters are unexpected, they describe a more "normalized" portrait of reentering individuals compared to existing reentry narratives. By emphasizing the dismal circumstances and dire prospects of individuals at reentry, previous scholars have unwittingly turned reentering individuals into the "other," a stigmatized portrait of socially isolated, frustrated, and deviant ex-inmates. Although this image might have been more relevant when incarceration was a relatively rare experience and reentry back into the community was an uncommon occurrence, the contemporary reality is that reentry is not exceptional, particularly in certain communities, and that reentering individuals are not unusually isolated or emotionally negative about their circumstances. By making this argument, I am not deemphasizing the poor employment and reentry prospects of reentering individuals; in contrast, my aim is to shift the focus away from explanations that center on certain individual-level deficiencies for dire outcomes—e.g., social isolation, hesitation to use contacts, and negative emotional wellbeing—and towards the more consequential structural explanations for reentry outcomes.

I. POLICY IMPLICATIONS

At its base, the problem of reentry is similar to the problem that low-skill, urban workers face more generally: it is the lack of good quality employment opportunities in the contemporary US labor market. Changes over the past four decades have led to a deteriorated labor market for low-skill workers (Kalleberg 2011) and a shift away from blue-collar, industrial jobs accessible to urban centers (Wilson 1996, 2012). These changes, combined with the very disadvantaged

position of reentering individuals, push reentering individuals to the lowest rungs of the labor market. They compete for very low quality jobs that offer little stability or financial sufficiency.

Given this labor market reality, what are the policy implications for reentering individuals? Transitional jobs programs provide some opportunities for formal labor market work. Primarily offering maintenance and street cleaning work, these jobs are by definition temporary and they offer low wages that are unsustainable in the long term. The greater promise is job creation that is relevant to the current economy and that offers potential for long-term sufficiency. Electronic waste recycling ventures that recruit formerly incarcerated men, such as RecycleForce and Isidore Electronics Recycling, are examples of sustainable, low-skill and manual employment opportunities. Warehouse jobs for online, by-mail distributors and retailers are other examples of contemporary, low-skill job opportunities. However, in the latter case, the demand for these jobs and the lack of an explicit social entrepreneurship goal allow employers to offer no more than the legal minimums, to pay an hourly wage of $7.25, to additionally charge for transportation to and from job sites far from urban centers, and to require high quotas for job completion. Although these jobs are often discussed by reentering individuals as the "gold standard," they pay very little, particularly after accounting for transportation costs.

Public policies and private ventures that support the growth of good-quality, low-skill jobs are necessary to promote the self-sufficiency of reentering individuals and to increase public safety among low-income communities. This is a broad aim, which encompasses policy efforts for raising the minimum wage and for counteracting trends against part-time and irregular working schedules.

In addition to this more general and perhaps unrealistic objective, there is also a specific labor market trend that deteriorates opportunities for low-skill workers and that characterized an

important minority of the jobs obtained by study participants. The use of temporary positions by companies does not concern only low-skill workers (Kalleberg 2011); however, there is evidence that the growth of these jobs among low-skill positions has accelerated over the past several recessionary years (Rugaber 2013). Employers that contract with temporary agencies to fill positions have greater flexibility in changing the size of their workforce in lean economic times. They also are not responsible for providing employee benefits and for maintaining the legal standards of worker's rights; they can pass on these accountability issues to the temporary agencies with which they contract. A recent lawsuit involving temporary workers contracted by Wal-Mart illustrates how large corporations can pass-the-buck to temporary agencies, which compete for contracts and have incentives to provide workers at the lowest possible costs to contracted firms ("Wal-Mart is Sued by Temporary Workers" 2012). The growing prevalence of jobs that are offered by temporary agencies—about 12 percent of all jobs in the United States (Rugaber 2013)—is a worrisome trend that contributes to the further deterioration of low- and unskilled jobs available to workers.

II. RECOMMENDATIONS FOR REENTRY PRACTITIONERS

In addition to broad labor market implications, the findings from this dissertation point to several specific recommendations for reentry employment providers to more effectively support individuals in their search for work. Given the fiscal realities of constrained local government and community organization budgets, these recommendations are practical: they are low-cost and relatively easy to implement. In contrast to the previous section on public policy implications, which proposed changes to the labor market structure of low-wage employment, these recommendations are quite modest. However, the dissertation findings suggest that even marginal changes to reentry services might make consequential differences in the lives of

reentering individuals. There are four basic and concrete recommendations for employment reentry providers:

1. **Target younger, more advantaged individuals to keep them in the labor market.** Findings indicate that younger individuals search for work during the initial weeks after release but quickly stop searching and leave the labor market. Employment reentry providers could pay particular attention to this group of reentering individuals to help keep them engaged with job searching. As Chapter 4 described, individuals may search for work to narrow incongruence between desire and reality. If this is the case, individuals who cease searching might mistakenly believe that they did all they could do for their job search. Reentry providers could emphasize the array of different activities involved in job searching with these individuals. By highlighting activities that they could be doing, practitioners emphasize the disconnection between the initial desire to search for work and the reality of their actual, low levels of job searching. By bringing attention to other job search activities, practitioners might encourage this group of jobseekers to maintain searching for a longer time period.

2. **Provide transitional jobs to older, less advantaged individuals.** Results from Chapter 2 find that there is a small but important subset of reentering individuals that maintain high levels of job searching throughout the study period. The demographic profile of these searchers, as well as their already high levels of job searching activities, suggests that continued job searching on their own might not be productive. Instead, the provision of transitional jobs may offer the high level of support and intervention needed to demonstrate current commitment to employment and to establish employment experience helpful for obtaining work in the future. Despite the inconclusive outcomes of transitional jobs programs overall, there is evidence that these interventions are most effective with older individuals (Uggen 2000).

3. **Continue to offer employment reentry services to working individuals.** The findings suggest that even individuals who obtain work would benefit from better quality employment. Employment reentry practitioners should continue to keep engaged individuals who have found employment, particularly if that work is characterized by low wages or is off the books. The findings from Chapter 2 indicate that these individuals are working long hours for low wages; continued support from service providers could help these individuals obtain better quality employment, which would support their long-term trajectories.

4. **Connect jobseekers to peers in a group-based text messaging job forum.** Findings from the experimental intervention suggest that a peer-based forum for job information and social support from peers can redirect communication and efforts towards job searching. Individuals connected through this forum experienced better emotional wellbeing and spent more days searching for work and working. By using the same, free mobile phone application adopted for this project (https://groupme.com), individuals can be easily connected to others. Employment reentry counselors can text real-time job information to the group, as opposed to the more common method of distributing hard copies of job announcements days or even weeks after the employer's initial job posting.

III. FUTURE RESEARCH

This project contributes new insight to the job search experiences of reentering individuals. Although the chapters describe areas for future research specific to the chapter, an overarching question that remains unanswered is what activities do individuals spend their time on, if not job searching or working? Chapter 2 suggested that the majority of individuals spend little time searching for work after the first month, and Chapter 4 indicated that individuals were often "too busy" to search. The most obvious answer, which scholarship often suggests, is that

individuals turn to illicit activities to make ends meet (Apel and Sweeten 2010; Sullivan 1989). However, this is a risky proposition for individuals who are still on parole. Survey answers collected in real time suggest that participants spend their time on a variety of conventional activities, such as babysitting, picking up children from school, watching older relatives, caring for family members with chronic health conditions, or addressing other household chores. Given the gendered nature of imprisonment, and the relatively more advantaged labor market position of their female romantic partners in the contemporary labor market (Kalleberg 2011), reentering men may be turning to household work to make non-financial contributions to their families.

A better understanding of the activities to which individuals choose to devote their time would contribute important information about whether policy makers, practitioners, and scholars should continue to encourage reentering individuals to search for work. If individuals are fulfilling necessary household tasks that address an important role for their families, it is less clear whether they should devote time to searching for work in a market in which they are highly disadvantaged. However, if individuals are instead turning to illicit and criminal activities for financial gain, this choice endangers public safety, risks future imprisonment, and does not build up critical experience necessary to eventually transition to the labor market. Prior scholarship has emphasized the importance of this latter factor for explaining earnings differentials over the life course (Apel and Sweeten 2010). Researchers should not assume that reentering individuals are necessarily turning to illicit activities if they drop out of job searching, and future work would shed valuable empirical evidence on this assumption in order to quantify the severity of costs involved in exiting the labor market.

References

Abbott, Andrew. 1995. "Sequence Analysis: New Methods for Old Ideas." *Annual Review of Sociology* 93–113.

Abbott, Andrew, and John Forrest. 1986. "Optimal Matching Methods for Historical Sequences." *Journal of Interdisciplinary History* 471–94.

Apel, Robert, and Gary Sweeten. 2010. "The Impact of Incarceration on Employment during the Transition to Adulthood." *Social Problems* 57(3):448–79.

Barrett, Lisa Feldman. 1997. "Descriptions, and Retrospective Ratings of Emotion." *Personality & Social Psychology Bulletin* 23(i10):1100.

Becker, Gary S. 1962. "Investment in Human Capital: A Theoretical Analysis." *Journal of Political Economy* 70(5):9–49.

Bernard, H. Russell, Peter Killworth, David Kronenfeld, and Lee Sailer. 1984. "The Problem of Informant Accuracy: The Validity of Retrospective Data." *Annual Review of Anthropology* 13:495–517.

Bodker, Mads, Greg Gimpel, and Jonas Hedman. 2010. "Technology Use: Time-In or Time-Out." *ECIS 2010 Proceedings*.

Bonczar, Thomas. 2003. *Prevalence of Imprisonment in the US Population, 1974-2001*. Bureau of Justice Statistics.

Boriah, Shyam, Varun Chandola, and Vipin Kumar. 2008. "Similarity Measures for Categorical Data: A Comparative Evaluation." *red* 30(2):3.

Braman, Donald. 2004. *Doing Time on the Outside: Incarceration and Family Life in Urban America*. University of Michigan Press.

Brown, Deborah Wright, and Alison M. Konrad. 2001. "Granovetter Was Right The Importance of Weak Ties to a Contemporary Job Search." *Group & Organization Management* 26(4):434–62.

Bruch, Sarah, Myra Marx Ferree, and Joe Soss. 2010. "From Policy to Polity: Democracy, Paternalism, and the Incorporation of Disadvantaged Citizens." *American Sociological Review* 75(2):205–26.

Bushway, Shawn, Michael A. Stoll, and David F. Weiman. 2007. *Barriers to Reentry?: The Labor Market for Released Prisoners in Post-Industrial America*. New York: Russell Sage Foundation.

Carson, E. Ann, and Daniela Golinelli. 2012. "Prisoners in 2012." Bureau of Justice Statistics.

Clear, Todd R., Elin Waring, and Kristen Scully. 2005. "Communities and Reentry: Concentrated Reentry Cycling." in *Prisoner Reentry and Crime in America*, edited by Jeremy Travis and Christy Visher. Cambridge: Cambridge University Press.

Cox, David R. 1975. "Partial Likelihood." *Biometrika* 62(2):269–76.

Crossley, Craig D., and Jeffrey M. Stanton. 2005. "Negative Affect and Job Search: Further Examination of the Reverse Causation Hypothesis." *Journal of Vocational Behavior* 66(3):549–60.

Crutchfield, Robert D., and Susan R. Pitchford. 1997. "Work and Crime: The Effects of Labor Stratification." *Social Forces* 76(1):93–118.

Duneier, Mitchell. 2011. "How Not To Lie With Ethnography." *Sociological Methodology* 41(1):1–11.

Eagle, Nathan, and Alex Pentland. 2006. "Reality Mining: Sensing Complex Social Systems." *Personal and Ubiquitous Computing* 10(4):255–68.

Eagle, Nathan, Alex Pentland, and David Lazer. 2009. "Inferring Friendship Network Structure by Using Mobile Phone Data." *Proceedings of the National Academy of Sciences (PNAS)* 106(36):15274.

Elliott, James R. 1999. "Social Isolation and Labor Market Insulation: Network and Neighborhood Effects on Less-Educated Urban Workers." *Sociological Quarterly* 40(2):199.

Elzinga, Cees H. 2006. "Sequence Analysis: Metric Representations of Categorical Time Series." *Sociological Methods and Research*.

Eonta, Alison M., Lillian M Christon, Shannon E Hourigan, Neeraja Ravindran, Scott Vrana, Michael Southam-Gerow. 2011. "Using Everyday Technology to Enhance Evidence-Based Treatments." *Professional Psychology: Research and Practice* 42(6):513–20.

Feld, Scott L., and William C. Carter. 2002. "Detecting Measurement Bias in Respondent Reports of Personal Networks." *Social Networks* 24(4):365–83.

Fernandez, Roberto, and David Harris. 1992. "Social Isolation and the Underclass." *Drugs, Crime, and Social Isolation: Barriers to urban opportunity* 257–93.

Fernandez, Roberto M. 2010. "Creating Connections for the Disadvantaged: Networks and Labor Market Intermediaries at the Hiring Interface." (http://dspace.mit.edu/handle/1721.1/66681).

Fernandez, Roberto M., and Isabel Fernandez-Mateo. 2006. "Networks, Race, and Hiring." *American Sociological Review* 71(1):42–71.

Fryer, David, and Roy Payne. 1984. “Proactive Behaviour in Unemployment: Findings and Implications.” *Leisure Studies* 3(3):273–95.

Gabadinho, Alexis, Gilbert Ritschard, Nicolas Séverin Mueller, and Matthias Studer. 2011. “Analyzing and Visualizing State Sequences in R with TraMineR.” *Journal of Statistical Software* 40(4):1–37.

Gabadinho, Alexis, Gilbert Ritschard, Matthias Studer, and Nicalas S. Müller. 2009. “Mining Sequence Data in R with the TraMineR Package: A Users Guide for Version 1.2.” *Geneva: University of Geneva*.

Gaggioli, Andrea, Giovanni Pioggia, Gennaro Tartarisco, Giovanni Baldus, Daniele Corda, Pietro Cipresso, Giuseppe Riva. 2011. “A Mobile Data Collection Platform for Mental Health Research.” *Personal and Ubiquitous Computing* 1–11.

Gaumer, Elyzabeth, Daniel Bell, Nathaniel Osgood, and Jeanne Brooks-Gunn. 2014. “Opportunities and Challenges for Leveraging Smartphone Technology in Field Studies: A Pilot Study in New York City.” Population Association of America Annual Meeting.

Geller, Amanda, Irwin Garfinkel, Carey E. Cooper, and Ronald B. Mincy. 2009. “Parental Incarceration and Child Well-Being: Implications for Urban Families.” *Social Science Quarterly* 90(5):1186–1202.

Geronimus, Arline T. 1992. “The Weathering Hypothesis and the Health of African-American Women and Infants: Evidence and Speculations.” *Ethnicity & Disease* 2(3):207–21.

Goffman, Alice. 2009. “On the Run: Wanted Men in a Philadelphia Ghetto.” *American Sociological Review* 74(3):339–57.

Goldberg, Rachel, Marta Tienda, Janet Vertesi, and Alicia Adsera. 2014. “Smartphone Study of Teen Relationships: Anatomy of a Pilot.” Population Association of America Annual Meeting.

Granovetter, Mark S. 1973. “The Strength of Weak Ties.” *American Journal of Sociology* 78(6):1360–80.

Granovetter, Mark. 1995. *Getting a Job: A Study of Contacts and Careers*. 1st ed. University Of Chicago Press.

Guerino, Paul, Paige M. Harrison, and William J. Sabol. 2011. “Prisoners in 2010.” *Bureau of Justice Statistics, US Department of Justice*.

Hagan, John. 1993. “The Social Embeddedness of Crime and Unemployment.” *Criminology* 31(4):465–91.

Harding, David J., Jessica J.B. Wyse, Cheyney Dobson, and Jeffrey D. Morenoff. 2013. “Making Ends Meet After Prison.” *Journal of Policy Analysis and Management*.

Hicks, John, Nithya Ramanathan, Donnie Kim, Mohamad Monibi, Joshua Selsky, Mark Hansen, Deborah Estrin. 2010. "AndWellness: An Open Mobile System for Activity and Experience Sampling." Pp. 34–43 in *Wireless Health*

Holzer, Harry. J., Steven Raphael, and Michael A. Stoll. 2006. "Perceived Criminality, Criminal Background Checks, and the Racial Hiring Practices of Employers." *Journal of Law and Economics* 49(2):451–80.

Holzer, Harry J., Steven Raphael, and Michael A. Stoll. 2007. "The Effect of an Applicant's Criminal History on Employer Hiring Decisions and Screening Practices: Evidence from Los Angeles." *Barriers to Reentry? The labor market for released prisoners in post-industrial America* 117–50.

Hulkko, Sami, Tuuli Mattelmäki, Katja Virtanen, and Turkka Keinonen. 2004. "Mobile Probes." Pp. 43–51 in *Proceedings of the third Nordic conference on Human-computer interaction, NordiCHI '04*. New York, NY, USA: ACM.

Irwin, John. 1987. *The Felon*. University of California Press.

Jahoda, Marie. 1981. "Work, Employment, and Unemployment: Values, Theories, and Approaches in Social Research." *American Psychologist* 36(2):184.

Kalleberg, Arne L. 2011. *Good Jobs, Bad Jobs: The rise of polarized and precarious employment systems in the United States, 1970s to 2000s.* Russell Sage Foundation, New York.

Kasintiz, Philip, and Jan Rosenberg. 1996. "Missing the Connection: Social Isolation and Employment on the Brooklyn Waterfront." *Social Problems.* 43:180.

Killingsworth, Matthew A., and Daniel T. Gilbert. 2010. "A Wandering Mind Is an Unhappy Mind." *Science* 330(6006):932–932.

Kinicki, Angelo J., and Janina C. Latack. 1990. "Explication of the Construct of Coping with Involuntary Job Loss." *Journal of Vocational Behavior* 36(3):339–60.

Kling, Jeffrey R. 2006. "Incarceration Length, Employment, and Earnings." *National Bureau of Economic Research Working Paper Series* No. 12003.

Krueger, Alan, and Andreas Mueller. 2011. "Job Search, Emotional Well-Being and Job Finding in a Period of Mass Unemployment: Evidence from High-Frequency Longitudinal Data." *Brookings Papers on Economic Activity*.

Lageson, Sarah, and Christopher Uggen. 2013. "How Work Affects Crime—And Crime Affects Work—Over The Life Course." Pp. 201–12 in *Handbook of Life-Course Criminology*. Springer.

Lalonde, Robert J., and Rosa M. Cho. 2008. "The Impact of Incarceration in State Prison on the Employment Prospects of Women." *Journal of Quantitative Criminology* 24(3):243–65.

Langan, Patrick A., and David J. Levin. 2002. *Recidivism of Prisoners Released in 1994*. US Department of Justice.

Laub, John, and Robert Sampson. 2003. *Shared Beginnings, Divergent Lives: Delinquent Boys to Age 70*. Harvard University Press.

Loeffler, Charles E. 2013. "Does Imprisonment Alter the Life Course? Evidence on Crime and Employment from a Natural Experiment." *Criminology.* 51(1): 137-166.

Love, Margaret Colgate, Jenny Roberts, and Cecelia Klingele. 2013. *Collateral Consequences of Criminal Convictions: Law, Policy and Practice*. Thomson West.

Lynch, James P., and William J. Sabol. 2001. "Prisoner Reentry in Perspective." *Urban Institute.*

Lyons, Christopher J., and Becky Pettit. 2011. "Compounded Disadvantage: Race, Incarceration, and Wage Growth." *Social Problems* 58(2):257–80.

Mamykina, Lena, Elizabeth Mynatt, Patricia Davidson, and Daniel Greenblatt. 2008. "MAHI: Investigation of Social Scaffolding for Reflective Thinking in Diabetes Management." Pp. 477–86 in *Proceedings of the SIGCHI Conference on Human Factors in Computing Systems*.

Marin, Alexandra. 2004. "Are Respondents More Likely to List Alters with Certain Characteristics?: Implications for Name Generator Data." *Social Networks* 26(4):289–307.

Marsden, Peter V. 1990. "Network Data and Measurement." *Annual Review of Sociology* 435–63.

Marsden, Peter V. 2003. "Interviewer Effects in Measuring Network Size Using a Single Name Generator." *Social Networks* 25(1):1–16.

Maruna, Shadd, and Hans Toch. 2005. "The Impact of Imprisonment on the Desistance Process." in *Prisoner Reentry and Crime in America*. Cambridge University Press.

McCarthy, Bill, and John Hagan. 2001. "When Crime Pays: Capital, Competence, and Criminal Success." *Social Forces* 79(3):1035–60.

McCormick, Tyler H., Matthew J. Salganik, and Tian Zheng. 2010. "How Many People Do You Know?: Efficiently Estimating Personal Network Size." *Journal of the American Statistical Association* 105(489):59–70.

McFadyen, Ruth G., and Jonathan P. Thomas. 1997. "Economic and Psychological Models of Job Search Behavior of the Unemployed." *Human Relations* 50(12):1461–84.

McKee-Ryan, Frances, Zhaoli Song, Connie R. Wanberg, and Angelo J. Kinicki. 2005. "Psychological and Physical Well-Being during Unemployment: A Meta-Analytic Study." *Journal of Applied Psychology* 90(1):53.

Miritello, Giovanna, Esteban Moro, Rubén Lara, Rocío Martínez-López, John Belchamber, Sam G.B. Roberts, and Robin I.M. Dunbar. 2013. "Time as a Limited Resource: Communication Strategy in Mobile Phone Networks." *Social Networks*.

Miritello, Giovanna, Rubén Lara, Manuel Cebrian, and Esteban Moro. 2013. "Limited Communication Capacity Unveils Strategies for Human Interaction." *Scientific reports* 3.

Mouw, Ted. 2003. "Social Capital and Finding a Job: Do Contacts Matter?" *American Sociological Review* 68(6):868–98.

Mouw, Ted. 2002. "Racial Differences in the Effects of Job Contacts: Conflicting Evidence from Cross-Sectional and Longitudinal Data." *Social Science Research* 31(4):511–38.

Murphy, Alexandra. 2012. "The Social Organization of Black Suburban Poverty: An Ethnographic Community Study." Dissertation. Princeton University.

Nelson, Marta, Perry Deess, and Charlotte Allen. 1999. *The First Month Out: Post-Incarceration Experiences in New York City*. Vera Institute of Justice.

Nosek, Brian A., Mahzarin R. Banaji, and Anthony G. Greenwald. 2002. "E-Research: Ethics, Security, Design, and Control in Psychological Research on the Internet." *Journal of Social Issues* 58(1):161–76.

Ohm, Paul. 2009. "Broken Promises of Privacy: Responding to the Surprising Failure of Anonymization." *SSRN eLibrary*.

Onnela, Jukka-Pekka, Jari Saramäki, Jörkki Hyvönen, Gábor Szabó, D. Lazer, Kimmo Kaski, János Kertész, and Albert-Lázsló Barabási. 2007. "Structure and Tie Strengths in Mobile Communication Networks." *Proceedings of the National Academy of Sciences* 104(18):7332–36.

Onnela, Jukka-Pekka, Jari Saramäki, Jörkki Hyvönen, Gábor Szabó, M. Argollo de Menezes, Kimmo Kaski, Albert-Lázsló Barabási, and János Kertész. 2007. "Analysis of a Large-Scale Weighted Network of One-to-One Human Communication." *New Journal of Physics* 9(6):179.

Pager, Devah. 2003. "The Mark of a Criminal Record." *American Journal of Sociology* 108(5):937–75.

Pager, Devah. 2007. *Marked: Race, Crime, and Finding Work in an Era of Mass Incarceration*. University Of Chicago Press.

Palmer, John, Thomas Espenshade, Frederic Bartumeus, Chang Y. Chung, Necati Ercan Ozgencil, Kathleen Li. 2013. "New Approaches to Human Mobility: Using Mobile Phones for Demographic Research." *Demography* 50(3):1105–28.

Paul, Karsten I., and Klaus Moser. 2009. "Unemployment Impairs Mental Health: Meta-Analyses." *Journal of Vocational Behavior* 74(3):264–82.

Paul, Karsten I., and Klaus Moser. 2006. "Incongruence as an Explanation for the Negative Mental Health Effects of Unemployment: Meta-Analytic Evidence." *Journal of Occupational and Organizational Psychology* 79(4):595–621.

Pettit, Becky. 2012. *Invisible Men: Mass Incarceration and the Myth of Black Progress*. Russell Sage Foundation.

Plowman, Lydia, and Olivia Stevenson. 2012. "Using Mobile Phone Diaries to Explore Children's Everyday Lives." *Childhood* 0(0):1–15.

Portes, Alejandro. 2000. "The Two Meanings of Social Capital." *Sociological Forum* 15(1):1–12.

Rabe-Hesketh, Sophia, and Anders Skrondal. 2008. *Multilevel and Longitudinal Modeling Using Stata*. STATA press.

Raento, Mika, Antti Oulasvirta, and Nathan Eagle. 2009. "Smartphones: An Emerging Tool for Social Scientists." *Sociological Methods & Research* 37(3):426 –454.

Redcross, Cindy, Dan Bloom, Erin Valentine, Michelle S. Manno, Sara Muller-Ravett, Kristin Seefeldt, Jennifer Yahner, Alford A. Young, Jr., Janine Zweig. 2010. *Work After Prison: One-Year Findings from the Transitional Jobs Reentry Demonstration*. New York: MDRC.

Redcross, Cindy, Dan Bloom, Gilda Azurdia, Janine Zweig, and Nancy Pindus. 2009. *Transitional Jobs for Ex-Prisoners: Implementation, Two-Year Impacts, and Costs of the Center for Employment Opportunities (CEO) Prisoner Reentry Program*. MDRC.

De Reuver, Mark, Harry Bowman, Nico Heerschap, and Hannu Verkasalo. 2012. "Smartphone Measurement: Do people use mobile applications as they say they do?" *2012 International Conference on Mobile Business*.

Rugaber, Christopher. 2013. "Temporary Jobs Becoming a Permanent Fixture." *Associated Press*, July 7.

Sabol, William J. 2007. "Local Labor-Market Conditions and Post-Prison Employment Experiences of Offenders Released from Ohio State Prisons." in *Barriers to Reentry? The Labor Market for Released Prisoners in Post-industrial America*, edited by Shawn Bushway, Michael A Stoll, and David F Weiman. New York: Russell Sage Foundation.

Sampson, Robert J., and Charles Loeffler. 2010. "Punishment's Place: The Local Concentration of Mass Incarceration." *Daedalus* 139(3):20–31.

Sampson, Robert, and John Laub. 1995. *Crime in the Making: Pathways and Turning Points through Life*. Harvard University Press.

Schnittker, Jason, and Andrea John. 2007. "Enduring Stigma: The Long-Term Effects of Incarceration on Health." *Journal of Health and Social Behavior* 48(2):115.

Schwarz, Norbert. 2007. “Retrospective and Concurrent Self-Reports: The Rationale for Real-Time Data Capture.” *The Science of Real-Time Data Capture: Self-reports in health research* 11–26.

Shiffman, Saul. 2007. “Designing Protocols for Ecological Momentary Assessment.” *The Science of Real-Time Data Capture: Self-reports in health research* 27–53.

Singer, Judith D., and John B. Willett. 2003. *Applied Longitudinal Data Analysis: Modeling Change and Event Occurrence*. Oxford University Press.

Singleton, Jr, Royce A., and Bruce C. Straits. 2009. *Approaches to Social Research*. Oxford University Press, USA.

Small, Mario Luis. 2004. *Villa Victoria: The Transformation of Social Capital in a Boston Barrio*. University of Chicago Press.

Smith, Sandra Susan. 2010. *Lone Pursuit: Distrust and Defensive Individualism Among the Black Poor*. Russell Sage Foundation Publications.

Solomon, Amy, Kelly Dedel Johnson, Jeremy Travis, and Elizabeth McBride. 2004. *From Prison to Work: The Employment Dimensions of Prisoner Reentry*. Urban Institute.

Stafford, Christopher. 2006. “Finding Work: How to Approach the Intersection of Prisoner Reentry, Employment, and Recidivism.” *Georgetown Journal on Poverty Law and Policy* 13:261.

Stone, Arthur, Saul Shiffman, Audie A. Atienza, and Linda Nebeling. 2007. *The Science of Real-Time Data Capture : Self-Reports in Health Research*. Oxford University Press.

Sullivan, Mercer L. 1989. *“Getting Paid”: Youth Crime and Work in the Inner City*. Cornell University Press.

Sykes, Gresham M. 2007. *The Society of Captives: A Study of a Maximum Security Prison*. Princeton, NJ: Princeton University Press.

Torelli, Nicola, and Ugo Trivellato. 1993. “Modelling Inaccuracies in Job-Search Duration Data.” *Journal of Econometrics* 59(1):187–211.

Travis, Jeremy. 2005. *But They All Come Back: Facing The Challenges Of Prisoner Reentry*. Washington, DC: The Urban Institute.

Travis, Jeremy, and Joan Petersilia. 2001. “Reentry Reconsidered: A New Look at an Old Question.” *Crime & Delinquency* 47(3):291.

Travis, Jeremy, and Christy Visher. 2005. *Prisoner Reentry and Crime in America*. Cambridge University Press.

Turney, Kristin, and Christopher Wildeman. 2013. "Redefining Relationships: Explaining the Countervailing Consequences of Paternal Incarceration for Parenting." *American Sociological Review* 78(6):949–79.

Uggen, Christopher and Melissa Thompson. 2003. "The Socioeconomic Determinants of Ill-Gotten Gains: Within-Person Changes in Drug Use and Illegal Earnings." *American Journal of Sociology* 109(1):146–85.

Uggen, Christopher. 2000. "Work as a Turning Point in the Life Course of Criminals: A Duration Model of Age, Employment, and Recidivism." *American Sociological Review* 529–46.

Uggen, Christopher, Sara Wakefield, and Bruce Western. 2005. "Work and Family Perspectives on Reentry." *Prisoner Reentry and Crime in America* 209–43.

Visher, Christy A., Laura Winterfield, and Mark B. Coggeshall. 2005. "Ex-Offender Employment Programs and Recidivism: A Meta-Analysis." *Journal of Experimental Criminology* 1(3):295–316.

Visher, Christy, Sara Debus, and Jennifer Yahner. 2008. *Employment after Prison: A Longitudinal Study of Releasees in Three States*. Urban Institute.

Visher, Christy, and Vera Kachnowski. 2007. "Finding Work on the Outside: Results from the 'Returning Home' Project in Chicago."in *Barriers to Reentry? The Labor Market for Released Prisoners in Post-industrial America*, edited by Shawn Bushway, Michael A Stoll, and David Weiman. New York: Russell Sage Foundation.

"Wal-Mart Is Sued by Temporary Workers." *Reuters*, October 22, 2012.

Walls, Theodore, and Joseph Schafer. 2005. *Models for Intensive Longitudinal Data*. Oxford University Press.

Wanberg, Connie R., Jing Zhu, and Edwin AJ Van Hooft. 2010. "The Job Search Grind: Perceived Progress, Self-Reactions, and Self-Regulation of Search Effort." *Academy of Management Journal* 53(4):788–807.

Ward Jr., Joe H. 1963. "Hierarchical Grouping to Optimize an Objective Function." *Journal of the American Statistical Association* 58(301):236–44.

Warr, Peter. 1987. *Work, Unemployment, and Mental Health.* Oxford University Press.

Warren, John R., A. Halpern-Manners, L. Luo, James M. Raymo, and Alberto Palloni. 2013. "Do Different Methods for Modeling Age-Graded Trajectories Yield Consistent and Valid Results." *Unpublished manuscript*.

Weaver, Vesla, and Amy Lerman. 2010. "Political Consequences of the Carceral State." *American Political Science Review* 104(04):817–33.

Western, Bruce, Jeffrey R. Kling, and David F. Weiman. 2001. "The Labor Market Consequences of Incarceration." *Crime & delinquency* 47(3):410.

Western, Bruce. 2006. *Punishment and Inequality in America*. Russell Sage Foundation.

Western, Bruce, Anthony Braga, Jaclyn Davis, and Catherine Sirois. "Leaving Prison as a Transition to Poverty." *Working paper*.

Wildeman, Christopher, Jason Schnittker, and Kristin Turney. 2012. "Despair by Association? The Mental Health of Mothers with Children by Recently Incarcerated Fathers." *American Sociological Review* 77(2):216–43.

Wilson, William Julius. 1996. *When Work Disappears: The World of the New Urban Poor*. New York: Alfred A. Knopf.

Wilson, William Julius. 2012. *The Truly Disadvantaged: The Inner City, the Underclass, and Public Policy, Second Edition*. University of Chicago Press.

Winkelmann, Liliana, and Rainer Winkelmann. 1998. "Why Are the Unemployed so Unhappy? Evidence from Panel Data." *Economica* 65(257):1–15.

Wolff, Nancy, and Jeffrey Draine. 2004. "Dynamics of Social Capital of Prisoners and Community Reentry: Ties That Bind?" *Journal of Correctional Health Care* 10(3):457–90.

Yakubovich, Valery. 2005. "Weak Ties, Information, and Influence: How Workers Find Jobs in a Local Russian Labor Market." *American Sociological Review* 70(3):408–21.

Young, Cristobal. 2010. "Unemployment Insurance and Job Search Effort: Evidence from Random Audits." *Working Paper*.

Young, Cristobal. 2012. "Losing a Job: The Nonpecuniary Cost of Unemployment in the United States." *Social Forces* 91(2):609–34.