



Replication Validation of the Employment Retention Inventory

An Assessment Tool of the
National Institute of Corrections

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Executive Summary

Purpose

This report summarizes findings from the Urban Institute's replication validation of the National Institute of Corrections (NIC) Employment Retention Inventory (ERI). This study was conducted under NIC Cooperative Agreement Award 16CS04GKU7 to determine the ERI's ability to identify workforce detachment risks for employed and unemployed justice-involved populations in Indiana, New York, and Massachusetts. This study also examined practitioners' use of the ERI in diverse community correctional settings.

Methods

From June 2017 to July 2018, 185 employed and 148 unemployed people participated in the study, completing the ERI during check-in meetings with NIC-trained Employment Retention Specialists. Most study participants were living in the community under probation or parole supervision or with a history of justice involvement; others were incarcerated in state prison. ERI baseline responses were quantitatively compared with employment outcomes approximately 3 to 6 months later for all participants. The relationship between employment and recidivism was also examined. Qualitative interviews with ERI-trained professionals provided insight into the instrument's use in practice.

Results

Items in the ERI showed strong content and construct validity, meaning the tool conceptually covered the key domains related to employment retention, particularly for community-based participants. Predictive validity analyses demonstrated that the ERI yielded "good" and "excellent" performance ratings in predicting unemployment 3 to 6 months later for those in community settings. Analyses of the ERI's validity for incarcerated participants were insufficient due to small sample sizes. For all participants, bivariate analyses supported a linkage between employment experiences and recidivism. ERI practitioners expressed that the instrument had strong utility and potential for their work.

Conclusion

Overall, validation analyses coupled with practitioners' feedback suggests that the ERI, when implemented with motivational interviewing and cognitive behavioral techniques learned through NIC's Employment Retention Specialist training, could be a useful case management tool for community correctional populations.

Introduction

Millions of Americans struggle to overcome the consequences of criminal justice involvement, reintegrate successfully within communities, and, as a sign of that success, forge attachments to the workforce. According to the Bureau of Justice Statistics, in 2016 over 6.6 million adults in the United States were under justice supervision—including 2.2 million in prison or jail and 4.5 million in the community under probation (3.7 million) or parole (875,000) supervision (Kaeble and Cowhig 2018). After release from incarceration, many return to the system at some point. Within three years, over two-thirds are rearrested and nearly half are returned to prison (Durose, Cooper, and Snyder 2014).

Evidence has shown that people who find and sustain employment have a reduced probability of justice involvement and experience an enhanced quality of life (Caspi, Moffitt, and Silva 1998; Kling, Weiman, and Western 2000; Winkelmann 2009). Recent studies confirm that work is associated with both financial security and life satisfaction (Tang et al. 2016). For those living under community supervision, reduced criminal involvement has been associated with improved work performance (Wooditch, Tang, and Taxman 2014).

Recognizing the importance of workforce attachment to the success of people with justice involvement, the National Institute of Corrections (NIC) developed the Employment Retention Initiative to support certified training of professionals in justice and behavioral health settings. The Employment Retention Inventory (ERI) supports this training as an assessment tool—designed by NIC in collaboration with Learning Designs Inc.—that helps professionals identify job loss risks among clients so employment needs can be addressed through cognitive-behavioral techniques or referrals to appropriate programs and services.

The ERI contains approximately 40 items clustered into seven key domains, measuring employment barriers, stress, time management, family and friends, substance abuse, mental health, and possible job loss (unemployment). Each domain captures information about challenges, situations, and perceptions clients may be experiencing that could decrease their ability to retain or obtain employment.

In the first validation of the ERI, the tool was administered as an online survey in two probation and parole offices: an urban county in Pennsylvania and a rural county in Oregon. Employed people on probation or parole took the ERI without any professional conversations about their results afterward, to see if their ERI responses alone (at baseline) were predictive of job loss eight months later. The ERI

was found to identify employment-related risks and predict job loss fairly well, suggesting it should continue to be studied.

The ERI's replication validation was intended to test the ERI's performance in new and diverse settings, for both employed and unemployed justice populations, and when used by NIC-trained Employment Retention Specialists as part of case management activities. Another goal was to understand the challenges and facilitators of ERI implementation for professionals working in correctional and community settings. Data collected for the ERI's replication validation were also used to examine the relationship between employment and recidivism among study participants.

Barriers to Employment Retention

For people reentering civilian life after incarceration, finding and maintaining employment can be difficult. Justice-involved people face a number of barriers, including housing instability, transportation problems, lack of job satisfaction, substance use, and mental health issues, when seeking and retaining employment (Yahner, Paddock, and Buck-Willison 2016). These challenges affect previously incarcerated people's opportunities for obtaining and retaining employment.

Recent research continues to support existing studies' conclusions about the key barriers to workforce attachment. Housing instability and inadequate childcare can strain someone's ability to realize employment or keep a job (Corcoran, Danziger, and Tolman 2004; Danziger et al. 1999; Hofferth and Collins 2000). People with a history of incarceration face additional housing barriers, and studies show that, without housing assistance, those with justice involvement are likely to recidivate into jail or prison (Lutze, Rosky, and Hamilton 2014).

Further, transportation issues such as absence of a vehicle, unreliable public transportation systems, and not possessing a driver's license negatively affect individuals' chances for employment (Corcoran Danziger, and Tolman 2004; Danziger et al. 1999). Job opportunities in densely populated urban areas are often inaccessible to marginalized groups who live in suburban areas (Hu 2015). Relying on family, friends, taxi, or public transportation to travel to work is not always feasible, especially for people under community supervision (Johnson 2014).

Substance abuse and issues with physical or mental health often impede employment or retaining employment (Holzer, Raphael, and Stoll 2003). People with depression or anxiety are less likely to be employed and have poorer work performance (Zivin et al. 2016). Among 800 people with a history of substance abuse, three-quarters of whom were unemployed, most said that substance abuse was the

reason they were without a job (Sherba et al. 2018). In a qualitative study of people on probation, respondents prioritized substance abuse recovery over assistance with employment, housing, and food intake (Dong et al. 2018). Current substance abuse issues has long been identified as one of the “central eight” domains predicting people’s engagement in criminal activity and inability to maintain employment (Andrews and Bonta 2010).

Recent literature also confirms that lacking formal education and practical skills makes entry into the labor force more difficult. Even when a high volume of jobs is available in urban areas, job requirements often specify advanced education or certifications that disqualify marginalized groups from possible employment (Duane, Reimal, and Lynch 2017). Many people with justice involvement lack a high school diploma, which further decreases their likelihood of subsequent employment (Apel and Sweeten 2009). Both men and women on parole report skill deficiencies that hinder their ability to find work (Johnson 2014).

In sum, many justice-involved and formerly incarcerated people face barriers related to housing, transportation, mental health, substance abuse, education, and skills training that make it challenging to find and retain the type of employment needed for successful community reintegration.

Employment Retention Initiative

Employment retention has been an emphasis of NIC's federal assistance for nearly two decades. At a national forum of correctional administrators and practitioners in 1999, NIC revised its focus on employment placement to prioritize job retention, a focus that has since grown into NIC's nationwide Employment Retention Initiative and culminated in certified training of hundreds of practitioners.

The ultimate goal of NIC's initiative is to support the gainful attachment of justice-involved people to the workforce such that, even in the face of job setbacks, they repeatedly seek to return to employment. Accordingly, the Employment Retention Initiative encourages practitioners' assessments of individuals' job loss risks to identify employment-related needs and subsequently respond with supports that increase the likelihood of workforce attachment.

In support of practitioners' ability to identify and respond to clients' employment-related risks, NIC delivers in-person and online trainings that cover such topics as career development, employment barriers, and employment readiness. These trainings are designed for any case manager who serves clients with criminal justice involvement or other behavioral health problems. NIC-trained practitioners have included probation and parole officers, employment counselors, community-based service and treatment providers, and correctional industries managers.

NIC's courses are successive, beginning with training to become a general [Employment Specialist](#), then a [Workforce Development Specialist](#), and finally an [Employment Retention Specialist](#). Someone who completes the Employment Retention Specialist training "develops and implements workforce development services and uses evidence-based practices for career planning and successful, long-term gainful employment that leads to sustained economic self-sufficiency" (Taylor 2010, 4). Practitioners may also seek training to establish a Job Club in their community, similar to the [Job Club](#) established in the Massachusetts site in this study.

During NIC's Employment Retention Specialist training, practitioners learn about the risk-need-responsivity model, which asserts that programs and services should match a client's level of risk, target their identified needs related to that risk, and be in a mode that responds to their learning style (Bonta and Andrews 2010). As described next, the Employment Retention Inventory supports the risk-need-responsivity principle by highlighting clients' unemployment risk areas and facilitating structured conversations specific to those areas.

Employment Retention Inventory

The Employment Retention Inventory (ERI) is a key component of NIC's Employment Retention Initiative and was designed by NIC in collaboration with Learning Designs Inc. The ERI is an assessment tool to support practitioners in helping clients retain employment. The 40-question instrument is designed to be self-administered, after which clients' answers are reviewed in a motivational and cognitive-behaviorally focused conversation with their NIC-trained Employment Retention Specialist (e.g., probation or parole officer, case manager).¹

Employment Retention Specialists are trained by NIC to use two evidence-based strategies when talking with clients about their ERI responses: *motivational interviewing* and *cognitive-behavioral techniques* (Taylor 2014). Both motivational interviewing and cognitive-behavioral techniques are intended to help guide productive conversations and action plans in response to clients' ERI-identified employment risks. Through motivational interviewing, practitioners help clients explore problem areas, elicit self-motivational statements, and strengthen clients' motivations for behavioral changes (Miller and Rollnick 2012). Using cognitive-behavioral techniques, practitioners help clients identify thoughts and feelings associated with faulty thinking patterns and negative behaviors, so they can rethink those thoughts and reframe behaviors more positively in response. NIC's intent is that Employment Retention Specialists use the ERI with all clients to foster collaborative relationships and improve the consistency, structure, and effectiveness of case management at facilitating clients' gainful attachment to the workforce.

¹ Although the core domains of the ERI are described in this report, the 40 questions are omitted because of NIC's strong sense of responsibility to ensure the tool is used correctly by practitioners. Accordingly, NIC only identifies ERI items for those who complete the comprehensive Employment Retention Specialist training surrounding the tool's use.

Validating the ERI

First ERI Validation

In the first ERI validation study, the goal was to test the ERI's predictive ability absent any discussions with employment specialists about available employment services, using motivational interviewing or cognitive-behavioral techniques (Yahner, Paddock, and Buck-Willison 2016). Rather, the ERI was a self-administered, online survey for clients in probation and parole agencies—who were employed at least part time—to take in semiprivate settings. The two sites included in the first validation were the predominantly urban Allegheny County, Pennsylvania, and the predominantly rural Jackson County, Oregon.

During the ERI's administration, clients' probation or parole officers did not see their responses or discuss them afterward with clients. Neither site offered—at the time of the study—any services targeting employment retention. Only people who were employed at the time were administered the ERI, by study design. Study participants who were unemployed were given a short survey that did not contain the ERI's 40 items.

After employed study participants took the online ERI survey, their employment status and any recidivism events were followed for several months. The primary outcome of interest was job loss (or retention) eight months after taking the ERI. Employment data was derived from either a follow-up online survey administered by Urban researchers or administrative data collected by Pennsylvania and Oregon correctional agencies—depending upon which data were most available and complete.

Overall, this initial validation effort found people's ERI responses to be fairly predictive of job loss. There was more complete data available for study participants in the rural location, and perhaps relatedly, some indication of the tool's better performance in the rural than urban study site. Additionally, the ERI was determined to be readable at a 6th grade level, adequately capturing factors related to job loss based on employment retention literature, and covering a comprehensive set of domains related to job loss. The first study also found a modest relationship between employment and recidivism.

Findings from the ERI's first validation, therefore, supported continued efforts to validate the ERI in new and diverse settings and when used by NIC-trained Employment Retention Specialists, which was NIC's ultimate intended use of the assessment tool.

Replication ERI Validation

Launched in September 2016, the replication ERI validation was designed to evaluate the ERI's predictive performance when used by NIC-trained practitioners in new criminal justice settings with diverse samples. Additionally, the study was to test ERI's effectiveness at predicting job attainment and retention for those who were currently unemployed. During the replication study, the ERI was administered to both employed and unemployed people in three selected study sites: the state of Indiana; Essex County, Massachusetts; and the state of New York.

Revisions to ERI Wording

At the study's launch, Urban worked collaboratively with NIC to slightly revise the original ERI wording based on the first validation findings and to develop a parallel version of the ERI that would be applicable to unemployed people.

Revisions included removing one item in the possible job loss domain that had not performed well in the first ERI validation, and adding one item to the stress domain regarding a livable wage, in response to comments from participants. In addition, an open-text question was added at the end that asked participants, "What other things would you like to talk about with an employment counselor?"

When making a version of the ERI for unemployed people, item wording was kept as close as possible to the original ERI version for employed people. The most common adjustment was that the word "job" or "work" was replaced with the phrase "finding a job" or "job search." Many items stayed exactly the same, especially in the family and friends, substance use, and mental health domains.

Online ERI Data Collection

The finalized versions of the ERI were then computerized into an online platform in Qualtrics (www.qualtrics.com), a software program for making secure, customized surveys. Any practitioner with Internet access and the secure link to the ERI could let clients self-administer the survey. Alternatively, as was the case in some sites with Internet restrictions, a practitioner with Internet access could ask and enter clients' responses one by one.

Regardless of the ERI administration method, upon completion a PDF of the answers was generated that a practitioner could then print and/or save to a file to discuss ERI responses with the client.

All administrations of the ERI were online; no paper copies of the ERI were used. Because all participants used the online version, responses were immediately and directly available to Urban's research team. An offline version of the ERI was also created so it could be administered via tablets in correctional settings that lacked Internet access; one site used a tablet to administer ERIs. Once the tablet was connected to Wi-Fi, responses were uploaded automatically to Qualtrics to be shared with the research team.

Research Questions

The ERI's replication validation focused on five research questions surrounding the ERI's performance as an assessment tool, as follows:

1. **How strong is the construct validity of the ERI?**

Construct validity helps determine whether items in a tool conceptually measure what they purport to measure. For the ERI, items were conceptually designed to measure job loss risks—risks that were grouped into seven domains related to workforce attachment barriers. The first ERI validation established its construct validity through a literature/expert review and based on analyses of data collected from justice-involved study participants. The replication ERI validation focused on repeating these analyses with data collected from new samples of participants.

2. **How strong is the predictive validity of the ERI?**

Predictive validity assesses how accurately the ERI is able to group people into low, medium, or high risk of job loss (or, for those currently unemployed, risk of being unable to obtain a job). Predictive performance can be assessed by looking at participants' ERI responses at baseline, using them to develop a predictive probability of unemployment at follow-up, and then comparing those predictions to actual follow-up outcomes. For the ERI replication validation, it was also necessary to examine whether practitioners' referrals of clients to services intended to address ERI-identified needs affected the tool's predictive performance.

3. **Does the ERI's performance vary by client characteristics, including study site, current employment status, and demographic characteristics?**

Because the ERI is intended to apply to diverse people in various criminal justice and community settings, Urban's researchers wanted to understand its predictive validity

performance for different groups of participants, based on their geographic location, employment status at baseline, and key demographic characteristics.

4. **What is the nature of the relationship between employment and recidivism?**

As a secondary goal of the ERI replication validation, the relationship between study participants' employment at baseline and recidivism outcomes at follow-up were examined.

5. **What are practitioners' experiences integrating the ERI into meetings with clients?**

The replication study also presented an opportunity for Urban's researchers to gather information about NIC-trained practitioners' experiences implementing the ERI in their daily interactions with clients. These implementations occurred in diverse settings with varying limitations on the amount of time and restrictions on space available for client conversations.

Study Recruitment

To conduct the ERI validation replication study, Urban's team worked collaboratively with NIC to identify diverse criminal justice agencies across the country as study sites. Past participants of NIC's employment retention trainings were invited via email to attend a webinar describing the proposed validation and to submit an application if interested in participating. Several sites indicated interest, and all efforts were made to explore the feasibility of each in serving as a replication validation site.

The criteria for site selection were that (1) practitioners at the site had participated in NIC's Employment Retention Specialist training, (2) the online ERI could be administered to approximately 150 clients² over a three-month period, (3) employment data for clients could be tracked by practitioners afterward, and (4) employment and recidivism data could be provided to Urban's researchers.

The selected study sites were in the state of Indiana; Essex County, Massachusetts; and the state of New York. Most practitioners in each site were already trained as Employment Retention Specialists, but some in Indiana and New York needed to be trained, so NIC staff provided training on-site before study launch to support the replication validation efforts.

In each site, nearly all clients of the participating professionals took the ERI, as the ERI was incorporated into routine case management through the study's duration. Clients became study

² This sample size was later reduced to a minimum of 50 clients given time constraints on recruitment in some sites.

participants only after voluntarily consenting to participate by agreeing to the web-based consent form at the start of the ERI. The secure online ERI introductory screen was used to provide informed consent; it explained the purpose of the study, that participation was voluntary and confidential, and that access was requested to individuals' official records by Urban's researchers. Respondents had to explicitly check two boxes to indicate agreement to share (1) demographic, employment, and service information; and (2) criminal records. Urban research staff also signed confidentiality pledges to protect the study data collected. All study procedures received full review and approval by Urban's Institutional Review Board.

Study Sites

In this section, we describe the study context of the three sites selected for the replication ERI validation—Indiana; Essex County, Massachusetts; and New York—based on information gathered during phone and/or in-person communications with each site.

Urban’s researchers communicated regularly with each site throughout the project period via email and through check-in phone calls to troubleshoot issues and share updates on participant progress. In Indiana and New York, multiple agencies in different cities participated in the study, necessitating frequent communication and coordination. In addition, Urban’s team visited two sites in person—Indiana and Essex County, Massachusetts—to learn about the environments in which the ERI was administered and the experiences of practitioners.

Descriptive information on the types of study participants in each site, the ERI administration environment, and the professionals administering the ERI is provided in table 1 and in the following sections. Information about the geographic, demographic, and justice settings of each site is also described.

TABLE 1
Summary of Study Sites
Context of ERI administration

Site	Study participants	ERI administration environment	Professionals administering ERI
Massachusetts (Essex County)	1. People on probation	1. Participants self-administered ERI in the probation office on a tablet	1. One probation officer used ERI with his clients
Indiana	1. Incarcerated people participating in correctional industries	1. Participant read ERI items on computer near work area, professional clicked responses	1. Correctional industries plant manager and program director used ERI with people they did not supervise
	2. People in a community-based reentry program who were on supervision or had prior justice system involvement	2. Participants self-administered ERI in computer lab in employment center	2. Two reentry program coordinators used ERI with their clients
	3. People on parole	3. Participants self-administered ERI on computer in parole agency	3. Two parole agents used ERI with their clients

Site	Study participants	ERI administration environment	Professionals administering ERI
New York	1. People on probation	1/2/3. All participants self-administered ERI on a computer in the ERI professional's office or another available room	1. Two probation officers used ERI with their clients, one with another officer's clients
	2. People on parole	Same as participant group 1.	2. One parole officer used ERI with his clients
	3. People in community-based reentry programs who had current or prior justice system involvement	Same as participant group 1.	3. Four program practitioners used ERI with their clients

Indiana

Study participants in Indiana came from nine different counties representing both rural and urban areas (figure 1). The counties with the most participants were Madison, Hendricks, Marion, Wayne, and Miami. The population per square mile in these counties ranged from 99 people in Miami County to 2,280 people in Marion County. Located in the heart of Marion County, Indianapolis is the state's largest city and its capital. It has an estimated population of 855,550 people, with 2,270 people per square mile (U.S. Census Bureau 2017c). The largest industries are trade, transportation, and utilities; professional and business services; education and health services; government; and leisure and hospitality. The most common occupations as of May 2016 were office and administrative support, sales, transportation and material moving, and food preparation and serving (U.S. Bureau of Labor Statistics 2018d).

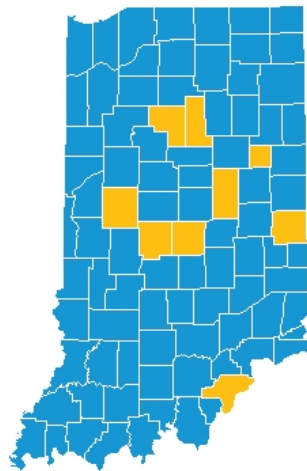
The majority of Indiana residents in all five counties are White, ranging from 56 percent in Marion County to 89 percent in Miami. Each county has smaller Black, Asian, Hispanic, and American or Alaska Native populations. Marion County is the most racially diverse, with a 29 percent African American population and an 11 percent Latino population (U.S. Census Bureau 2017c). Wayne, Madison, and Miami counties have elderly populations that are higher than the U.S. average, at 16 percent (U.S. Census Bureau 2017c, 2017e).

In terms of education, over 84 percent of residents in each Indiana county included in the study possess a high school diploma or higher, with a high of 94 percent in Hendricks County (U.S. Census Bureau 2017c). In 2016, median household incomes ranged from \$39,700 in Wayne County to \$73,000 in Hendricks County (U.S. Census Bureau 2017c). In 2016, the unemployment rate in Marion

County was well below the national rate, at 3 percent (U.S. Bureau of Labor Statistics 2018d). While the unemployment rate was relatively low, the share of people living in poverty in Indianapolis (21 percent) exceeded the national percentage of impoverished Americans (13 percent).

FIGURE 1
Indiana Counties with ERI Participants

■ County with participants ■ County with no participants



Indiana Criminal Justice Landscape

At the end of 2016, people under jurisdiction of state correctional authorities in Indiana totaled 25,550. Most were White (61 percent) and Black (34 percent), with smaller Hispanic (4 percent), American Indian or Alaska Native (0.2 percent), and Asian (0.3 percent) populations (Carson 2018). Regarding community supervision, Indiana recorded a total of 108,300 probationers and 8,385 parolees last year (Kaeble 2018).

Interviews with criminal justice professionals in Indiana revealed that the labor market was strong across the state as of 2017. There was a demand for all types of industries, from medicine to manufacturing to food service. This demand for work helped community corrections professionals build relationships with employers and recommend their clients to existing jobs.

ERI in Indiana

Multiple agencies in the Indianapolis area participated in the ERI replication validation. These included the Indiana Department of Correction's Prison Enterprises Network (PEN), the Hoosier Initiative for Re-Entry (HIRE), and Indiana Parole. PEN is the correctional industries organization of Indiana, with multiple facilities across the state where incarcerated people work in jobs ranging from packaging commissary orders for the prison facilities to remanufacturing automotive parts (State of Indiana, n.d.). HIRE prepares justice-involved people returning to the community for employment and provides case management during their first year of release (Indiana Department of Workforce Development, n.d.). Several parole agents in the Indianapolis area also contributed to the ERI study. The participating agencies in Indiana provided a diverse population of ERI clients with current and previous criminal justice involvement to the validation study.

ERI administration in Indiana varied by agency. For PEN, people were restricted from accessing computers directly, so one NIC-trained practitioner entered ERI answers as participants read each question, while a second NIC-trained practitioner discussed ERI answers overall with each participant. For HIRE and parole agencies, the ERI tool was self-accessed by people on agency computers, and conversations were held afterward with each person's respective employment counselor or parole agent. Employment data was tracked individually by each agency for the study, and criminal history records were supplied by the Indiana Department of Correction.

Massachusetts

One county in Massachusetts—Essex County—participated in the ERI replication validation (figure 2). Essex County lies in the northeast region of the state (north of Boston) and includes the city of Salem.

Essex County is a moderately dense area with approximately 1,500 people per square mile (U.S. Census Bureau 2017d). Health care and social assistance, retail trade, and manufacturing are the county's largest industries (U.S. Census Bureau 2017a). Office and administrative support, sales, food preparation and serving, management, health care, and education and library occupations characterize the majority of the county's labor force (U.S. Bureau of Labor Statistics 2018b). **Conversations with staff at the North Shore Career Center confirmed that healthcare and manufacturing are the major industries in Essex County.**

Residents in Essex County represented various races and ethnicities, including White (70.5 percent), Hispanic or Latino (21 percent), Black or African American (7 percent), Asian (4 percent), two

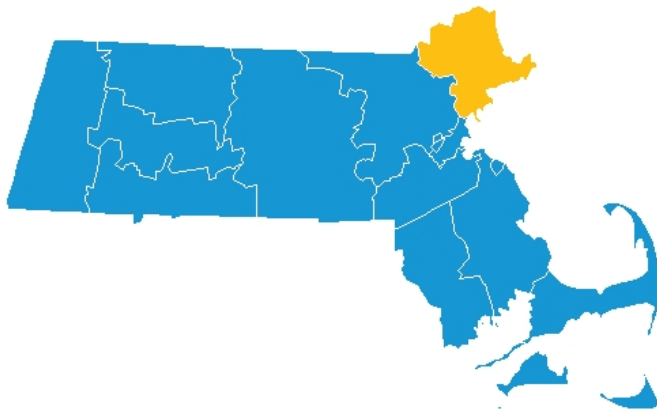
or more races (3 percent), and Native Hawaiian and Other Pacific Islander (0.2 percent; U.S. Census Bureau 2017d). The county has an elderly percentage (17 percent) that is comparable to the percentage for the entire United States (16 percent; U.S. Census Bureau 2017d).

FIGURE 2

Massachusetts County with ERI Participants

■ Essex County

■ County with no participants



The majority of residents in Essex County have obtained at least a high school diploma (89 percent) and over one third have a bachelor's degree or higher (38 percent; U.S. Census Bureau 2017d). The median household income is \$70,870. In June 2017, Essex County had a 4 percent unemployment rate, with 11 percent of its population living in poverty (U.S. Bureau of Labor Statistics 2018c; U.S. Census Bureau 2017d).

Massachusetts Criminal Justice Landscape

At the end of 2016, Massachusetts held 9,400 people in state correctional facilities (Carson 2018). As for individuals under community supervision, the state or federal corrections system supervised 61,800 people on probation and 1,850 people on parole (Kaeble 2018). The one-year recidivism rate, defined as a new arraignment, conviction, or violation of probation or parole, for people released from Essex County Sheriff's Department correctional facilities in 2015 was 41 percent (Pratt and Murphy 2017).

The Department of Correction offers MassCor as the state's correctional industry program for incarcerated people. Through MassCor, people develop skills while creating goods and services (State of Massachusetts, n.d.). The goal is to improve successful reentry into the workforce upon release.

The probation officer who administered the ERI in Massachusetts also partnered with the North Shore Career Center to create the “Making Real Changes” Job Club, a program designed to help justice-involved people find gainful employment. Criminal justice representatives from the MA Department of Correction, Probation and Parole, local police departments, and local courts expressed verbal support for the Job Club program and the importance of helping people with justice involvement find employment.

ERI in Essex County

One probation officer in Essex County Superior Court participated in the ERI study. The probation agency serves all cities and towns in Essex County (Commonwealth of Massachusetts 2018). The officer had completed NIC's Workforce Development and Employment Retention Specialist trainings and was eager to use the ERI to support his case management and Job Club efforts. The probation officer administered the ERI to as many people on his caseload as possible, and he checked their employment status at each subsequent check-in. The officer used the results of the ERI to guide program and service referrals where possible.

New York

Eight counties in New York participated in the ERI replication validation. The counties with the highest participation rates—the focus of this section—were Dutchess, Orange, Chautauqua, Kings, and Schenectady.

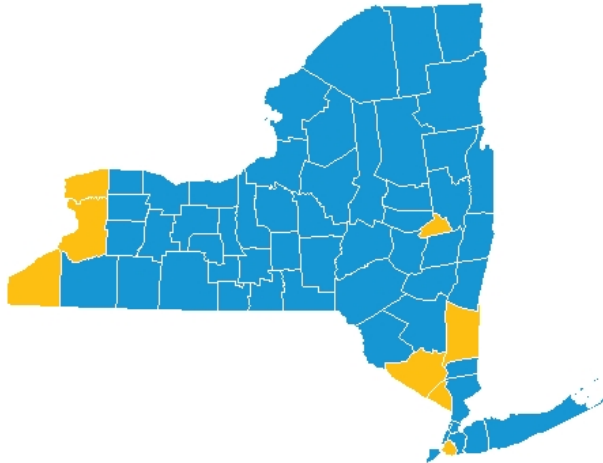
The populations of these five counties varied vastly. As of July 2017, over 2.6 million people lived in Kings County Brooklyn Borough, while just under 130,000 people lived in Chautauqua (U.S. Census Bureau 2017b). There were 35,400 people per square mile in Kings County compared with 130 people per square mile in Chautauqua. Suburban areas such as Schenectady, Dutchess, and Orange counties ranged from 375 people per square mile to 760 people per square mile (U.S. Census Bureau 2017b).

FIGURE 3

New York Counties with ERI Participants

■ County with participants

■ County with no participants



Among the three states participating in the ERI study, New York had the most diverse demographics. The share of White residents within a New York county ranged from 36 percent in Kings County Brooklyn to 87 percent in Chautauqua, with 71 percent in Dutchess (U.S. Census Bureau 2017b). Hispanic and Latino populations ranged from 7 percent in Schenectady County to 21 percent in Orange County (U.S. Census Bureau 2017b). Blacks or African Americans ranged from 3 percent in Chautauqua to 34 percent in Kings County. Asians represented 0.7 percent of the population in Chautauqua and 13 percent in Kings County Brooklyn (U.S. Census Bureau 2017b). Each county had less than 1 percent Native Hawaiian and Other Pacific Islanders and American Indian and Pacific Islanders. In terms of elderly populations, Chautauqua had the largest representation of people over the age of 65 (20 percent) and Kings County had the lowest (14 percent; U.S. Census Bureau 2017b).

Regarding education in all five counties, the median share of high school graduates who were at least 25 years old was 89 percent. The median share of people with a bachelor's degree or higher was 29 percent (U.S. Census Bureau 2017b). Orange County had the highest median household income (\$71,910) and Chautauqua had the lowest (\$42,211; U.S. Census Bureau 2017b). With over 19 percent each, Kings County and Chautauqua contained the highest shares of people living in poverty of the five ERI counties in New York. Dutchess County had the lowest poverty percentage at 9 percent (U.S. Census Bureau 2017a). Overall, in June 2017, New York State had a 5 percent unemployment rate (U.S. Bureau of Labor Statistics 2018a).

New York Criminal Justice Landscape

With one of the nation's larger correctional populations, New York had 50,720 people in state correctional institutions at the end of 2016. The number of Black individuals (48 percent) was nearly twice the number of White individuals (24 percent). Hispanics (24 percent) were disproportionately represented when compared to the U.S. total percentage of incarcerated Hispanics (17 percent). Fewer than 1 percent were American Indian or Alaska Native, Asian, or other racial origin in the state's prison population (Carson 2018). New York reported 97,928 people on probation and 44,426 on parole at the end of 2016 (Kaeble 2018).

To aid with the state's workforce and reentry efforts, the New York Department of Corrections and Community Supervision offered incarcerated people the option to gain skills through the Industries Program (Department of Corrections and Community Supervision, n.d.). Once assigned to the Industries Program, participants were placed into an available position that suited their background.

ERI in New York

Criminal justice professionals who administered ERI throughout the state of New York included probation and parole officers, reentry employment specialists, and community-based employment program providers. All professionals had completed NIC's training required for administering the ERI.

Study participants took the ERI in office settings, either on their case manager's computer or on another available computer. Some practitioners used the results of the ERI to recommend services to clients, while all used it to guide a conversation that covered concerns highlighted in the assessment. Practitioners tracked participants' employment experiences after taking the ERI, while criminal history records were obtained from the New York State Division of Criminal Justice Services.

Methods

Urban's researchers conducted several analyses, using both qualitative and quantitative methods, to answer the five research questions of the study.

Research Question 1: Construct Validity of the ERI

We conducted two types of analyses to reassess how well the ERI's domains measured what they purport to measure with regard to the risks and needs associated with employment retention. First, through quantitative analyses, we calculated the Cronbach's alpha for each domain, which measures the internal consistency of items within that domain, or how consistently the "yes" and "no" responses to items group together. Consistent with typical assessments, Cronbach alphas above 0.7 were considered to indicate satisfactory levels of internal consistency (Nunnally 1978).

In addition, we calculated the discriminatory slope of each item within each domain, using item response theory to test how well individual items distinguished people of different employment risks levels. Slope values greater than 0.65 were considered to indicate moderate or higher performance (Baker 2001; Giguère and Lussier 2016). Quantitative analyses were conducted for subgroups of study participants based on their employment status and whether they took the ERI in a community or incarceration setting. Finally, we reassessed the concurrent and convergent validity results from the first ERI validation study using replication validation data.

Second, using a qualitative approach, we examined participants' responses to an open-ended question at the end of the ERI instrument that asked about any additional employment-related concerns. Responses were compared to the domains and items covered in the ERI to ensure the tool addressed all employment-related risks, according to participants' stated concerns. In addition, we reassessed the face and content validity results from the first ERI validation study using replication validation data.

Research Question 2: Predictive Validity of the ERI

To reassess the predictive validity of the ERI in this replication validation, we developed a model that used items on the ERI to predict participants' risk of unemployment at follow-up. This regression-

based model was developed using data from the current ERI validation study in conjunction with data from the first validation study. The method of model development is described in detail in appendix A.

Multiple predictive validity performance indicators were examined to assess how well the developed ERI model predicted participants' employment status at follow-up. These quantitative measures included overall accuracy, sensitivity, specificity, area under the receiver operating characteristic curve (AUC), and positive and negative predictive values. (These terms are defined in the results section, starting on page 27.) Overall, these predictive performance measures reveal how accurately the ERI identifies people who will be unemployed at follow-up, along with how well it classifies people into different levels of job loss risk. We considered AUC values above 0.6 fair, 0.7 good, and 0.8 excellent (Hosmer and Lemeshow 2000). We used the same fair, good, and excellent metrics when evaluating the ERI's predictive accuracy, sensitivity, and positive and negative predictive values.

Research Question 3: Predictive Validity of the ERI by Subgroup

To assess how well the ERI performed for different types of people, we recomputed the key predictive performance measure, the AUC, for study participants grouped by age, race, and gender. We did these calculations for employed and unemployed, community-based participants separately. We then compared these values across participant subgroups to determine for which individuals the ERI had the strongest predictive performance. (The sample of incarcerated ERI participants was too small to be divided into age, race, and gender categories.)

Research Question 4: Employment Retention and Recidivism

To examine the relationship between participants' employment experiences and recidivism, we graphed the percentage of people who were (1) unemployed when they took the ERI *and* at the follow-up time point, (2) employed when they took the ERI but not at follow-up, (3) employed at follow-up only, and (4) employed when they took the ERI and at follow-up. We then used cross-tabulation analyses with Chi-squared significant testing to assess the likelihood of a recidivism event for each employment subgroup. For community-based participants, recidivism measures included

rearrest and reincarceration during the follow-up period. For incarcerated participants, the recidivism measures were “conduct violations” that occurred during the follow-up period.

Research Question 5: Practitioner Perspectives on Using the ERI

To understand the experiences and perspectives of NIC-trained practitioners who integrated use of the ERI with clients, we conducted in-person and telephone interviews as well as two site visits. During our Indiana site visit, we spoke with practitioners using the ERI with clients in probation and parole settings, as well as with clients currently incarcerated and working in correctional industries jobs. In Massachusetts, we spoke by phone and during an in-person site visit with the lead probation officer using the ERI and we met with criminal justice and Job Club professionals supporting his activities. In New York, we convened a virtual meeting of practitioners statewide to gain feedback on their experiences. Qualitative information from all interviews and site visit observations were analyzed to assess the overall takeaways on the ERI’s utility based on practitioners’ perspectives.

Study Participants

For the replication validation, 333 people completed the ERI between June 2017 and April 2018: 128 in Indiana, 55 in Massachusetts, and 150 in New York. Table 2 lists the data sources in each site.³

Within each site, practitioners tracked the employment status of participants for at least three months after they took the ERI using spreadsheets provided by Urban’s research team. Criminal history information was also tracked; in two sites (Indiana and New York), these data were obtained through the state criminal justice agency, while in the third site (Essex County, MA), the probation officer tracked arrests and other recidivism events during the follow-up period in the Urban-provided spreadsheet. Practitioners in all sites were also requested to track program or service referrals and, if known, service enrollment.

TABLE 2
Data Sources by Site

Site	Employment data	Criminal history data	Program data
Massachusetts (Essex County)	Practitioner	Practitioner	Practitioner
Indiana	Practitioners for community-based participants Indiana Department of Correction for incarcerated participants	Indiana Department of Correction	Practitioners and Indiana Department of Correction
New York	Practitioners	New York Division of Criminal Justice Services	Practitioners

Sociodemographic Characteristics

The three replication validation sites were relatively similar concerning participant demographics, particularly race and gender. Of the study participants whose race and gender were known ($n = 270$), approximately half were White men; this rate was consistent across all sites (54 percent in Indiana and 50 percent in both Massachusetts and New York).

³ For some analyses we also included data previously collected from Jackson County, Oregon, and Allegheny County, Pennsylvania, as part of the first ERI validation study. In both those sites, employment information on study participants was collected by practitioners and from an Urban-administered online survey, while criminal history information was provided by each county’s correctional agency. Information on the characteristics of participants in the first validation study are available in the first report (Yahner, Paddock, and Buck-Willison 2016).

Rates of Black and Hispanic participants, however, differed across sites. Only 3 percent of respondents in Indiana were Hispanic compared with 16 and 13 percent, respectively, in Massachusetts and New York. Correspondingly, Indiana had a much higher percentage of Black respondents (38 percent) than Massachusetts (25 percent) or New York (26 percent).

Sites also varied somewhat in the age ranges of participants. Of those whose age was known ($n = 270$), the mean age was 36 years. The most notable difference among sites was the relative youth of participants in Massachusetts, who had a mean age of 30 years. No participants in Massachusetts were older than age 44, compared with 30 percent in Indiana and 20 percent in New York.

TABLE 3
Participant Sociodemographic Characteristics

	All sites ($n = 270$)	Indiana ($n = 100$)	Massachusetts ($n = 55$)	New York ($n = 115$)
Age				
Average (years)	35.9	39.5	30.4	35.5
Percent ages 17–25	16.7	7.0	27.3	20.0
Percent ages 25–34	34.4	30.0	43.6	33.9
Percent ages 35–44	29.3	33.0	29.1	26.1
Percent ages 45–64	19.6	30.0	0.0	20.0
Gender (%)				
Male	88.9	95.0	81.8	87.0
Female	11.1	5.0	18.2	13.0
Race (%)				
White	58.9	59.0	58.2	59.1
Black	30.4	38.0	25.5	26.1
Hispanic	10.0	3.0	16.4	13.0
Asian	0.7	0.0	0.0	1.7

Notes: Sociodemographic information was not available for 63 participants (28 in Indiana and 35 in New York). Eighty participants in Indiana were incarcerated.

Employment Status

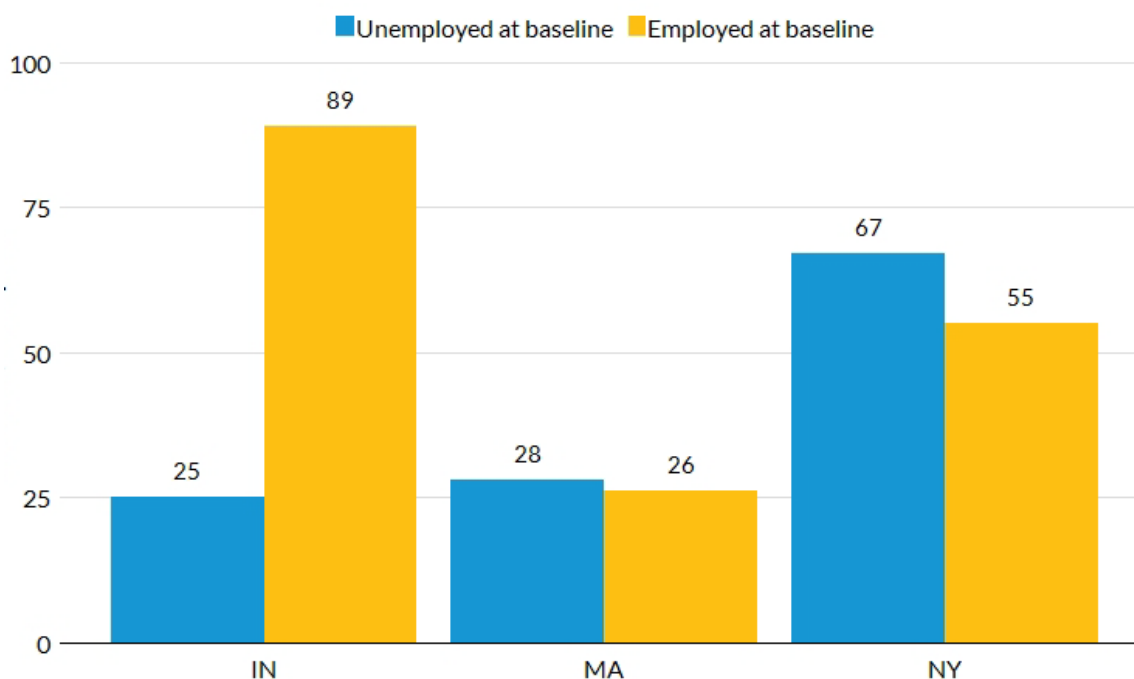
In this section, participants' employment status at the time the ERI was taken is compared with their employment status during the 180-day follow-up period. Data in this section represent 290 respondents because follow-up information was unavailable for 43 of the original 333 participants.

Employment at Baseline

Over half (59 percent) of participants indicated they were employed when they took the baseline ERI survey. Indiana reported the highest baseline employment rate (78 percent) followed by

Massachusetts (48 percent) and New York (45 percent). Indiana's higher rate of employment was driven by the large proportion of participants currently incarcerated and working in correctional industries.

FIGURE 4
Number of Participants Employed and Unemployed at Baseline ERI Survey by State



Employment at Follow-Up

Practitioners across the three sites collected follow-up information from participants within 180 days of the date each participant responded to the ERI. Some practitioners collected employment information at several points during the follow-up period for some participants, while others only checked in with participants once during. Because of the uneven nature of the timing and frequency of employment status data across participants, the numbers reported reflect the participants' employment status at the most recent available data point. The time from administration of the ERI to the most recent follow-up ranges from 5 to 177 days, with an average of 78 days. A slightly greater share of participants reported employment at follow-up (62 percent) than at baseline (59 percent).

There was considerable change in employment status from baseline to follow-up within sites. Indiana's employment rate dropped from 78 to 71 percent, while Massachusetts's increased from 48 to 61 percent and New York's increased from 45 to 54 percent.

FIGURE 5
Number of Participants Employed and Unemployed at Follow-Up ERI Survey by State

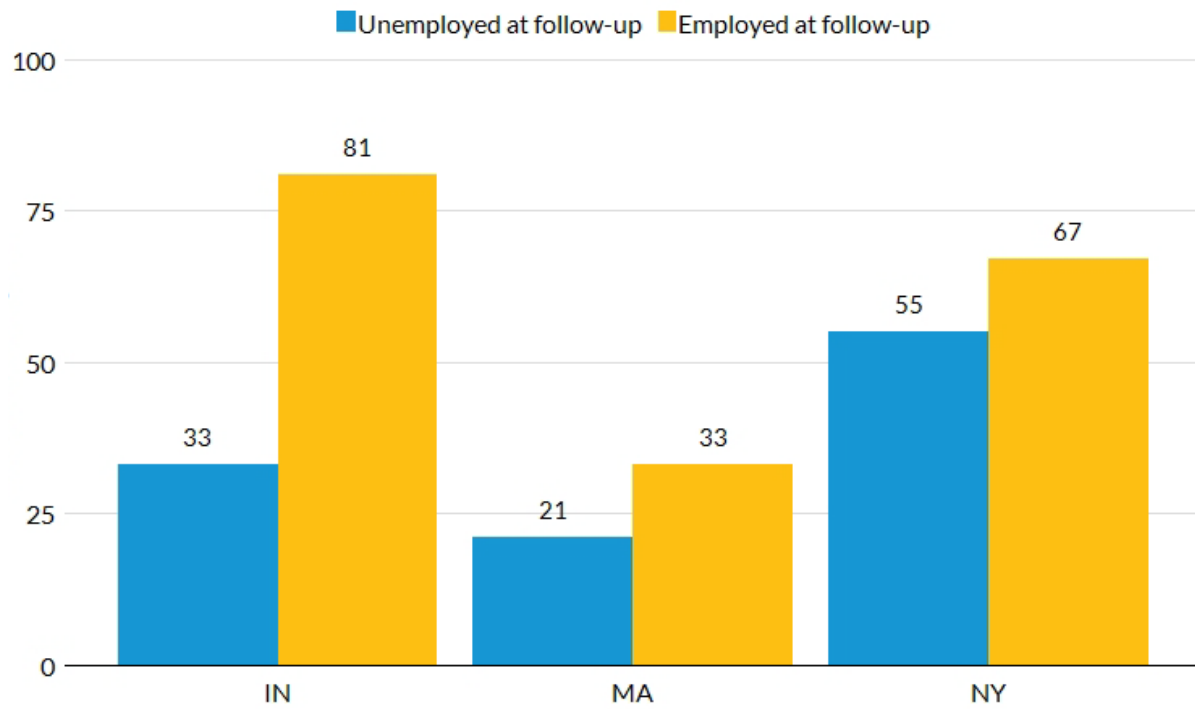
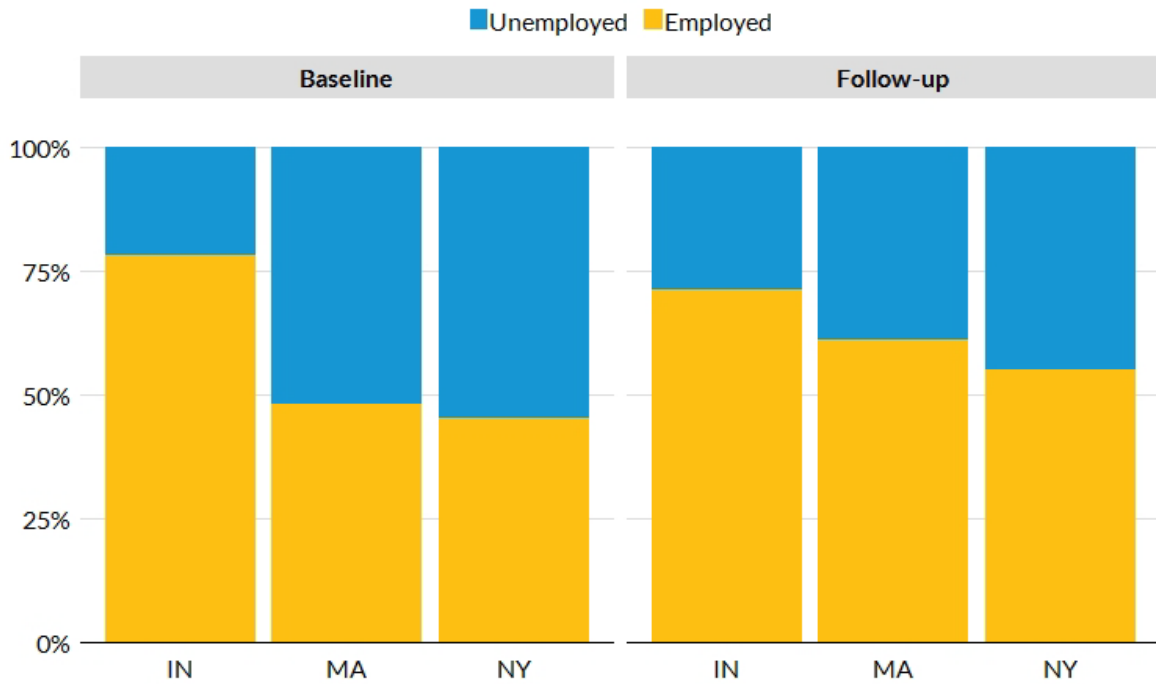


FIGURE 6
Share of Participants Employed and Unemployed at Baseline and Follow-Up by State



Access to Programming and Treatment

Some participants were referred to and enrolled in various programs and treatment, including those focused on finding or retaining employment, substance abuse treatment, anger management, parenting programs, domestic violence prevention programs, and others. Table 4 below shows the rates of referral to and enrollment in employment-focused programming and any programming or treatment.

TABLE 4
Participants' Referral to and Enrollment in Programming and Treatment (percent)

	All sites (<i>n</i> = 290)	Indiana (<i>n</i> = 114)	Massachusetts (<i>n</i> = 54)	New York (<i>n</i> = 122)
Referral				
Employment focused	27.6	32.5	37.0	18.9
Any program	60.7	51.8	85.2	58.2
Treatment				
Employment focused	26.5	31.6	33.3	18.9
Any program	57.6	49.1	77.8	56.6

Results

Measuring the **validity** of an assessment tool like the ERI helps indicate whether the instrument is assessing what it is intended to measure—for the ERI, this means employment retention or job loss risk (Hammersley 1987). Relatedly, measuring the ERI’s **reliability** provides an indication of whether the tool might provide consistent measurements of job loss risks when repeated over time by different individuals (Black and Champion 1976).

In this section, we assess the degree to which the ERI showed evidence of strong validity and reliability. Table 5 summarizes the specific types of validity and reliability that were examined in the first and/or replication ERI validation and the methods for those examinations. These analyses allowed us to assess the ERI’s performance during the study period and identify improvements to optimize its performance in the future.

TABLE 5
Definitions of ERI Validity Assessment Types

Psychometric property	Question answered	Assessment method
Face validity	Does the ERI appear “on its face” to measure the precursors of job loss?	Evaluate item content and prior efforts by ERI developers
Content validity	Do the ERI items cover the entire range of precursors to job loss?	Evaluate item content and prior efforts by ERI developers
Internal consistency reliability	Does the ERI yield consistent scores across items within each domain?	Cronbach’s alpha analysis (0.7 and higher) of each domain
Item discrimination	Do the ERI items discriminate between people with different levels of risk?	Item response discrimination slope analysis (0.65 and higher)
Convergent validity	Are ERI’s individual domain scores highly correlated (0.4 and above)?	Correlation analysis of ERI domain scores
Predictive validity	Does the ERI predict job loss or sustained unemployment within 6 months?	Estimate accuracy, sensitivity, specificity, area under the curve, positive/negative predictive values
Predictive validity across subgroups	Does the predictive validity of the ERI generalize across different types of individuals?	Age, race, and gender subgroup analyses of ERI predictive validity

Construct Validity

Face and Content Validity

During the first ERI validation, the research team evaluated the face and content validity of the ERI. Face validity refers to whether the ERI measure “on its face” risks related to job loss, and content validity refers to whether the ERI covers the key indicators related to job loss.

After examining prior research on barriers to employment and domains covered in other risk assessment tools, the research team determined that the ERI had strong face and content validity (Yahner, Paddock, and Buck-Willison 2016). The readability of the ERI was also assessed, and it was determined accessible to justice-involved populations. Further, 97 percent of study participants in the first validation rated the ERI as easy or very easy to take, while 92 percent said they felt comfortable or very comfortable answering the ERI’s questions. These findings suggested that the ERI had strong face and content validity.

In the current study, Urban’s researchers further examined the content validity of the ERI by reviewing the employment-related topics that participants indicated they were interested in discussing with employment counselors. At the end of the ERI assessment, participants were asked an open-ended question, “What other things would you like to talk about with an employment counselor?” By offering the opportunity to provide personal feedback, this option allowed respondents to elaborate on circumstances that may not have been identified in the ERI items.

Forty-two participants responded with at least one employment-related concern. These responses were categorized into the themes discussed next, first for participants who were employed at the time they took the ERI (baseline) and then for those unemployed at baseline.

EMPLOYMENT CONCERNS AMONG EMPLOYED PARTICIPANTS

Three major themes emerged from employed participants’ responses to the ERI. The first theme participants wanted to discuss was **better jobs**, suggesting that although participants were employed, they believed their jobs were of lower quality. Second, participants wanted to discuss additional **education and training**, implying that respondents wanted to move beyond their current job-related experience and knowledge in their respective fields. Third, participants wanted to discuss how their **community supervision requirements** negatively affected their job performance. Respondents noted that justice-driven obligations affected their ability to successfully fulfill their job duties.

Though respondents indicated that they were presently employed, their responses suggest minimal overall job satisfaction, namely in low wages and scarce job opportunities for people with criminal records. Two selected responses are listed below:

[I would like] to be able to find another job in my field that will pay a little better and provide more adequate benefits.

–54-year-old Asian man

I would like to know that there is REAL help for me in finding meaningful employment if I were to find myself unemployed. It can be very difficult.

–42-year-old White man

Further, participants longed for additional training and education. They expressed their desires for specific skills, employment strategies, and formal education. Quotes from participants included these two:

[I need] training for certification to become a counselor for youth and/or drug counseling. Also would like to obtain my CDL in the near future.

–40-year-old Black man

[I need help with] how to further my education so I can become more valuable in my line of work.

–32-year-old White man

Finally, mandated legal obligations conflicted with participant's job responsibilities, as seen in the following response:

[I] have to leave work early for programs for parole.

–Individual whose age/ race/ gender was unspecified

EMPLOYMENT CONCERNS AMONG UNEMPLOYED PARTICIPANTS

Four major types of employment-related concerns emerged from participants who were unemployed when they took the ERI. **Greater job availability** defined the first theme. Respondents were specifically interested in available jobs for people with criminal records. **Transportation barriers** followed as the second theme, given that issues with cars, drivers' licenses, and lack of reliable public transportation can make traveling to work more difficult. The third area of concern was **job search strategies and skills**. Similar to employed respondents, the final theme was **legal barriers**, where respondents expressed that their parole and probation conditions limited their capacity to find employment.

Many participants expressed wanting to know more about job availability, as shown in these selected responses:

[I need] more information regarding the type of jobs available and the process by which to get hired. When I get hired I usually retain my job.

–35-year-old Hispanic man

[I need help] finding a job where the employer doesn't discriminate because of my parole conditions, such as weekly reporting.

–56-year-old Hispanic man

In addition to wanting employment, participants were concerned with travel. Responses related to transportation barriers included the following:

How will I make it to work without a car?

–31-year-old Black man

[I need help with] transportation because I do not have a license.

–Individual whose age/ race/ gender was unspecified

Skills and job search strategies were important factors in finding and retaining work. Participants mentioned qualities that characterized job etiquette and approaches to gaining experiences that would make them marketable in the workplace, as shown in the following quotes:

[I have to learn] how to look the part for looking for a job, like what to wear and what to say to the person so I don't look like an idiot.

–31-year-old Black man

[I need help] finding a job or vocational training program to gain experience in a new career field also because of my criminal background.

–27-year-old White woman

The final category of employment-related concerns that participants expressed was legal barriers. Inquiries into modifying their record, system-mandated obligations, and the severity of respondents' charges characterized the concerns presented in this theme.

[I need to know] if a felony conviction can get cleared off your record for good behavior and a certain amount of time.

–23-year-old White man

Just the fact that my misdemeanor is [worse than] my felony and is preventing me from a multitude of obtaining jobs due to money handling in the customer service business. My charge [eliminates] many and most jobs and is overwhelming, though I keep trying.

–35-year-old White man

Notably, the major themes participants mentioned in the open-response question mirrored the themes covered elsewhere in the ERI's seven domains. These themes included not earning enough money, lacking training and education, the stigma of a criminal record, and issues with transportation. These results further support the content validity of the ERI by supporting its coverage of participants' key concerns with employment-related risks.

Internal Consistency Reliability

To assess whether items within each domain of the ERI related well to each other, Urban’s researchers calculated the Cronbach’s alpha for each domain. Cronbach’s alpha tests the intercorrelations among items in a test or survey, indicating how well a set of items measures a single construct or concept, such as “mental health” issues affecting job retention.

The ERI has seven domains with multiple questions in each. We calculated the Cronbach’s alpha for each domain by groups of participants, including those who were incarcerated and employed, those in the community and employed, those in the community and unemployed, and all those in the community. No participants were incarcerated and unemployed, since study recruitment occurred through correctional industries coordinators.

The ERI’s internal consistency reliability achieved an acceptably strong 0.7 or above for nearly all domains when looking at responses from participants in the community; it was above 0.9 for all items together. For employed people in the community, each of the seven domains had a Cronbach’s alpha above 0.7, while for unemployed people in the community, the alpha was 0.7 or above for four of the seven. These results were similar to those of the first ERI validation, in which all participants were employed and living in the community.

For incarcerated participants, only one ERI domains reached 0.7 or above: that related to experiences of stress. However, across all ERI items, the internal consistency reliability for incarcerated participants was 0.85. Responses to other items varied greatly for incarcerated participants—a group for whom ERI had not been tested nor specifically designed. Practitioners indicated that some incarcerated participants felt that certain ERI items, such as getting to work on time and having trouble sleeping at night, were not relevant when in a correctional setting.

TABLE 6
Internal Consistency Reliability Test Using Cronbach’s Alpha

Domain	Number of items	In the community: employed	In the community: unemployed	In the community: combined	Incarcerated: employed
Barriers	12	.832	.730	.782	.604
Stress	7	.800	.815	.818	.714
Time management	5	.835	.684	.749	.319
Family/friends	5	.758	.782	.773	.651
Substance use	5	.826	.832	.829	.609
Mental health	5	.780	.650	.712	.445
Work	4	.857	.642	.722	.609
Overall	43	.947	.912	.930	.846

Notes: Cronbach’s alpha 0.7 and above indicates strong internal consistency reliability.

Item Response Theory

To understand how well each ERI domain distinguished participants from each other based on job loss risks, Urban’s researchers applied item response theory. The discrimination/slopes of items in each domain were calculated to reveal how well each item distinguished different levels of the latent trait, employment retention risks. Higher slope values indicate an item is better at distinguishing between people of different levels of risk. A slope value above 0.65 indicates that the item performs moderately or better in discriminating between people of different risk levels (Baker 2001).

Of the 43 items on the ERI, the vast majority performed at least moderately well in distinguishing participants, regardless of their initial employment status and whether they were living in the community or in a correctional facility (table 7). Nearly all included items had a slope at or above 0.65, meaning they adequately distinguished between people with different levels of employment-related risk. Note that responses from the first ERI validation were included in this item response analysis; previously, they had been tested using only confirmatory factor analysis.

TABLE 7
Item Response Theory Discrimination Slopes

Item	All employed, current study	Employed, in community	Employed, incarcerated	Unemployed, in community	Employed, first study
Barriers					
1	2.34	2.58	1.09	1.37	1.48
2	1.42	1.11	2.60	0.82	1.21
3	1.38	1.50	1.33	0.51	1.37
4	1.86	1.77	1.47	1.18	1.38
5	1.71	2.53	0.73	1.73	1.23
6	2.44	2.24	3.42	1.38	1.55
7	1.95	1.95	NA	1.88	2.19
8	NA	NA	NA	0.63	1.76
9	1.45	1.01	1.75	1.13	1.13
10	2.69	2.34	5.22	1.49	2.53
11	3.00	2.88	3.76	1.39	2.24
12	0.88	1.36	0.42	1.53	1.33
Stress					
1	0.76	2.52	1.68	2.91	2.32
2	0.87	1.19	1.88	2.02	2.28
3	0.75	1.85	1.13	1.89	2.95
4	5.87	2.95	NA	1.55	1.35
5	4.85	2.64	0.83	2.08	--
6	1.82	3.38	3.27	2.10	3.34
7	0.98	2.30	2.11	1.62	1.67
Time management					
1	3.62	7.33	1.55	2.05	4.37
2	3.61	3.09	NA	1.52	1.36
3	2.33	2.62	1.63	3.44	2.28
4	1.20	1.56	1.10	3.72	1.83

Item	All employed, current study	Employed, in community	Employed, incarcerated	Unemployed, in community	Employed, first study
5	3.34	4.00	NA	1.77	1.55
Family and friends					
1	NA	2.30	1.10	1.52	1.78
2	1.29	1.55	0.86	3.01	2.43
3	1.80	4.47	3.36	3.89	4.29
4	NA	3.00	NA	3.67	1.98
5	2.12	2.84	1.01	2.82	4.81
Substance use					
1	2.79	3.02	2.37	3.58	2.22
2	4.76	5.10	4.54	5.53	3.53
3	2.82	3.07	2.41	2.77	2.44
4	0.94	1.35	0.54	1.64	1.17
5	1.98	2.40	1.63	3.11	2.13
Mental health					
1	2.71	3.44	0.96	2.31	2.38
2	1.71	1.84	2.97	1.42	1.42
3	2.04	2.27	-0.58	1.41	3.69
4	3.72	4.73	2.85	3.38	4.32
5	2.71	4.43	1.39	1.90	3.12
Job perceptions					
1	2.11	2.62	1.80	NA	1.72
2	3.45	7.15	1.73	NA	3.65
3	7.23	8.14	5.32	1.21	5.53
4	3.76	6.06	2.05	2.15	2.64

Notes: A discrimination slope above 0.65 indicates that the item at least moderately discriminates between people with different risk levels.

NA = This item had to be excluded for all the other items in the domain to successfully converge in the model.

-- This item was not included in the first ERI study.

Convergent Validity

The first ERI validation examined the convergent validity of ERI domains, which measures how related the seven domains are to each other. **Again, in this replication ERI validation, the ERI was found to have strong convergent validity.** All Pearson correlations among the seven domains were statistically significant and positive, with most rounding to 0.4 and above, indicating a large relationship. Thus, the seven domains of the ERI, although distinct, converged to measure different aspects of the same underlying concept: employment retention or job loss risk.

Predictive Performance

Of utmost importance to the ERI's validation is its ability to accurately predict job loss risks. Toward this end, information from baseline ERI responses was compared to participants' actual employment experiences approximately three to six months later. Urban's researchers used several tests, as described in this section, to assess the ERI's predictive performance.

First, using a random 70 percent of the participants, we developed a "training" predictive model to calculate the ability of the ERI at identifying which participants were at risk of unemployment. Then, we "tested" the performance of this model on the random third of participants who were not included in model development. More information on this training-testing method of model development is available in appendix A.

From this approach, we calculated six measures of predictive validity performance, each of which shows stronger predictive validity the higher the value, as follows:

- ***Area under the curve*** indicates the probability that a randomly chosen person who was unemployed at follow-up is ranked as higher risk initially than a randomly chosen person who was employed at follow-up; values range from 0 to 1.0, with values above 0.5 indicating prediction better than chance.
- ***Sensitivity*** refers to the true positive rate, or the proportion of people unemployed at follow-up whom the ERI accurately identified as being at high risk⁴ of unemployment; values range from 0 to 1.0.
- ***Specificity*** refers to the true negative rate, or the proportion of those employed at follow-up whom the ERI accurately identified as being at low risk of unemployment; values range from 0 to 1.0.
- ***Accuracy*** refers to the proportion of participants correctly classified as being low risk or high risk of unemployment at follow-up; values range from 0 to 1.0.
- ***Positive predictive value*** describes the proportion of people whom the ERI identified as at high risk of unemployment who were unemployed at follow-up; values range from 0 to 1.0.

⁴ "High risk" participants had an ERI predicted probability of unemployment of 0.5 or higher for the models developed with participants from the current study. For the model developed with only participants from the first study, "high risk" was defined as having a predicted probability of 0.2 or higher. Predicted probabilities of job loss ranged from .004 to .941 and were calculated from regularized Lasso logistic regression.

- **Negative predictive value** describes the proportion of people whom the ERI identified as at low risk of unemployment who were employed at follow-up; values range from 0 to 1.0.

Each of these predictive validity performance indicators is shown in table 8. The first set of columns shows results for the community-based study participants from the replication ERI validation (as well as respondents from the first study) for whom follow-up employment status was known ($N = 120$), while the second two sets of columns correspond to subsets of these participants from only the current study ($n = 63$) and the first study ($n = 57$). These subsamples represent a random 30 percent of the overall sample sizes for each group. Model performance varies across the different samples because each sample has a different set of cases and different distribution of follow-up employment.⁵

Alongside each indicator is an Urban-designated performance rating of “fair,” “good,” or “excellent,” which corresponds to rules of thumb as follows: values rounding to 0.6 are characterized as fair, 0.7 as good, and 0.8 or higher as excellent. In all cases, ratings less than fair are indicated by a dash.

TABLE 8
ERI Model Results

Predictive performance on test set

	Combined studies score	Combined studies rating	Replication ERI study score	Replication ERI study rating	First ERI validation score	First ERI validation rating
Area under the curve	0.742	Good	0.733	Good	0.621	Fair
Sensitivity	0.600	Fair	0.828	Excellent	0.727	Good
Specificity	0.913	Excellent	0.706	Good	0.587	-
Accuracy	0.808	Excellent	0.762	Good	0.614	Fair
Positive predictive value	0.774	Good	0.706	Good	0.296	-
Negative predictive value	0.820	Excellent	0.828	Excellent	0.900	Excellent

Notes: Separate models were developed for participants from the first study, the current study, and both studies. The same predictors were used in all models. Results are shown on the test set, which was made up of 30 percent of each respective group.

The ERI showed strong predictive performance for models developed with participants from the two studies combined. An AUC of 0.74 indicates that the assessment did a good job at ranking people who were unemployed at follow-up higher as higher risk than those who were employed at follow-up.

⁵ For example, the combined model includes people from five states and two different times, while the model built using only people from the current study has people from three states all in the same time. Often, as a sample becomes more diverse, the model has a more difficult time identifying strong patterns that predict unemployment. Further, each sample has a different balance of employment status at follow-up. In the first study, all participants were employed at baseline and the vast majority were unemployed at follow-up; this imbalance makes prediction more difficult.

The fair sensitivity performance of 0.60 and excellent specificity performance of 0.91 reveal that the tool did a better job at identifying people who would be employed at follow-up rather than unemployed. This discrepancy is likely caused by the imbalance of employment status in the sample. At follow-up, 34 percent of the sample was unemployed, making it harder to identify those who would be at high risk. Despite this, the overall accuracy of the model was excellent, at 80.8 percent.

The model developed with only current study participants also showed a strong predictive validity performance across all measures. In the current study, 46 percent of participants were unemployed at follow-up, making it easier to identify those at high risk. The AUC of 0.73 and accuracy of 76 percent were both good. The sensitivity at 0.82 was higher than specificity at 0.71, meaning that the assessment was better at identifying people who were unemployed at follow-up than employed.

The predictive performance for the model developed with only participants from the first study was fair but not as strong as models with current study participants included. The AUC and accuracy were fair at 0.62 and 0.61, respectively. The sensitivity was 0.73, while the specificity was 0.59. In the first ERI study, all the participants were employed when they took the ERI, and the unemployment rate at follow-up was 19 percent. This imbalance makes it difficult for the model to predict who will be unemployed.

There were too few incarcerated participants ($N = 80$) in the current ERI study sample to divide information into “training” and “test” subsamples to assess the ERI’s predictive performance for incarcerated people. As a preliminary exploration, the training model from community-based participants was applied to the incarcerated sample, and the resulting AUC was 0.46, indicating that the model did not perform as well as chance. The sensitivity was 0.30, which likely reflects how the incarcerated sample had a much lower base rate of unemployment (13 percent) than the community-based sample (34 percent). The inability of the community-based training model to perform well for incarcerated people implies that employment risks in correctional settings differ from community-based risks in ways that should be further explored with a larger sample of incarcerated people.

Controlling for Service Referrals

One goal of this study was to assess how well the ERI performed when used as envisioned by NIC—as part of case management by trained professionals who provided service referrals to clients based on identified employment risks and needs. During the study, we asked practitioners to record whether clients were referred to and/or enrolled in any services or treatment programs. These could be

directly employment-related, such as job training and job search assistance, or indirectly, such as substance use treatment or cognitive-behavioral therapy.

When developing predictive risk models, it is important to control for interventions that might counter somebody's level of risk observed when taking the assessment and lead them to a different outcome at follow-up. For example, if an individual was employed when they took the ERI and showed high risk in the substance use domain, they may be at a high risk of unemployment at follow-up. However, if that individual was referred to and enrolled in substance use treatment, their future employment risk might be mitigated and the risk assigned by the ERI at baseline would show up as incorrect (when it might have been true at the time, before participation in substance use treatment).

To test whether referrals to services and treatment affected the performance of the ERI, we developed a model that included service/treatment referral and enrollment as predictors. In this model, service/treatment referral and enrollment were associated with a decreased likelihood of unemployment at follow-up, as one would expect. However, with an AUC of 0.75, the model performed similarly to the model without these variables, which had an AUC of 0.74. These results revealed that although service/treatment information may help the ERI predict who is at high risk of unemployment, in this sample, this information did not significantly alter the ERI's original predictive performance. At this stage in the ERI's development, there was no prescriptive information about service matching provided to practitioners; rather, each professional chose what to offer each participant based on their conversations, prior experience working with similar clients, and knowledge of what community resources were available.

Predictive Performance for Subgroups

To test whether the ERI performed well for people with different demographic characteristics, we recalculated the AUC for subgroups of participants defined by race, age, and gender. Unlike the previously mentioned "test" models, this performance was examined across all 405 participants. We focused on three racial or ethnic groups (Black, White, and Hispanic), four age categories (17–24, 25–34, 35–44, and 45–64), and two gender categories (male and female). All demographic information was provided by the correctional agencies and practitioners.

For most subgroups, the AUC performance was similarly strong as it was for the overall sample of study participants. Black and White participants had an AUC close to 0.7, indicating good performance, while Hispanic participants had an AUC of 0.59, just under a fair performance. This somewhat lower performance for Hispanic participants may reflect the smaller sample size ($n = 38$) of

Hispanics compared to Black ($n = 74$) and White ($n = 248$) participants. (Results are not reported for Asians because of the small sample size.) All age groups had an AUC rounding to 0.7 or higher, indicating good performance. The ERI performed somewhat better for men than women, which may again be related to the smaller sample size of women ($n = 63$) compared to men ($n = 316$) in this study. **Future studies of the ERI's performance should include larger samples of Hispanic and female participants.**

TABLE 9
ERI Model Performance Results by Subgroup

Demographic	Sample size	AUC	Rating
Overall	405	0.71	Good
Race			
Black	74	0.69	Fair
Hispanic	38	0.59	-
White	248	0.72	Good
Age			
17–24	75	0.65	Fair
25–34	171	0.70	Good
35–44	83	0.78	Good
45–64	43	0.69	Good
Gender			
Male	316	0.73	Good
Female	63	0.59	-

Notes: Results show the AUC (area under the curve) of the combined model developed using participants from the current and first studies. Race was unavailable for 44 participants, age for 33 participants, and gender for 26 participants. Because of the small number of Asian participants ($n = 1$), results are not reported.

Practitioner Perspectives

This section summarizes information from NIC-trained practitioners regarding their experiences using the ERI with clients, to address the fifth and final research question. As explained earlier, the ERI is a component of NIC's larger Employment Retention Initiative. The ERI is designed to be used in tandem with NIC's Employment Retention Specialist (ERS) training curriculum for case managers serving criminal justice-involved clients or those with behavioral health problems. NIC indicates that case managers may be probation or parole officers, employment counselors, community-based providers, and correctional industries managers. Those who complete the NIC-sponsored training become Employment Retention Specialists. Only NIC-trained Employment Retention Specialists are authorized to administer the ERI. To date, hundreds of professionals have completed these trainings in numerous jurisdictions nationwide.

NIC developed the ERI to support case management by highlighting risk areas and informing structured conversations specific to employment. NIC's training in motivational interviewing and cognitive-behavioral techniques intends to provide Employment Retention Specialists with the skills to use the ERI to guide productive conversations and action plans. As envisioned, practitioners would discuss risks identified in the ERI with clients, and together they would identify solutions such as program referrals or behavioral changes. Ideally, using the ERI with all clients in a practitioner's caseload would lead to the creation of collaborative relationships between practitioners and clients, and it would make case management more consistent and structured.

The scope of the ERI replication validation did not encompass a formal "implementation evaluation" to examine how well the sites adhered to this model outlined by NIC. Such a review might have systematically examined how each site implemented the ERI and explored whether or how ERI was integrated into the site's ongoing case management activities and other evidence-based practices, looking at, for example, a site's existing case management process, including its assessment activities.⁶ The study did, however, collect qualitative feedback from practitioners at each replication ERI site

⁶ Case management should be a seamless, ongoing process. The core of effective case management is an empirical assessment of risk and criminogenic needs. A risk and needs assessment tool may be supplemented by other assessment tools that focus on specific areas of concern (e.g., mental health or substance abuse disorders). Ideally, someone's assessment (or set of assessments) leads to the development of tailored case plan that identifies the services and programs the person needs. The assessments and plans would be updated over time and would follow the person as he or she moves from institutional to community corrections and then to supervision. Best practices suggest that the case planning process should begin shortly after someone comes under either institutional or community corrections control and continue as the person moves from institutional facilities to community corrections and the community (Carey 2010).

about their experiences with the ERI. Through semi-structured in-person or phone interviews in three sites and in-person visits to two sites, the project team gathered impressions from the NIC-trained practitioners about the following aspects of the ERI's use:

- How easy was the ERI to administer?
- How easy were the ERI results to interpret and apply?
- To what extent was the information used to identify needed services or develop case plans?
- What were the benefits of using the ERI?
- What challenges to using the ERI were encountered and addressed?

Across all sites, overall practitioner feedback on using the ERI with clients was positive.

Practitioners and clients generally found the ERI's questions relevant and the online format accessible. The results of the ERI were always shared with the client, and the ensuing conversations supported case management and helped build relationships between the practitioners and clients. Case managers reported that it helped many unemployed clients realize that they were employable, and it helped several employed clients think through solutions to challenges they were facing at work.

The most commonly reported experience with the ERI was that it led to beneficial conversations.

These conversations between case managers and clients about their responses to the ERI ranged from 5 to 45 minutes. Many practitioners observed that it helped their clients open up, and that they were able to use motivational interviewing to encourage the conversation. Box 1 is a brief case study regarding Essex County that offers insights into how one site integrated the ERI into other employment-related and case management services.

The conversations generally complemented ongoing case management activities. Several probation officers stated that the ERI and the subsequent conversations helped solidify a positive working relationship with their clients. The motivational interviewing component helped break down the wall between practitioners and clients, and showed that the officers wanted their clients to succeed and were not "on the attack." Practitioners reported that clients appreciated the interest taken in them personally and being able to talk through issues.

BOX 1

Implementation of ERI in Essex County, Massachusetts

The Essex County pilot site of ERI was led by a probation officer, Todd Angilly, who had taken the NIC training in 2010 and was focused on employment issues as well as broader case management issues.

When Essex County Probation Officer Angilly returned from his first NIC training in 2010, he was determined to apply the employment-focused skills he had learned. The probation office was already providing some type of job assistance, but Angilly believed more could be done.

Shortly thereafter, with the assistance of a colleague and support of his supervisors and judges, Essex County started a “Making Real Changes” Job Club. The Job Club became a collaboration between the probation department and the North Shore Career Center, which had been serving individuals in Essex County for a number of years.

Meeting every Thursday at the career center for two hours, Job Club participants focused on a different topic each week. The entire Job Club session lasted for nine weeks. Participants were referred by their probation officers, and were further screened by Angilly to determine who would most benefit from the experience. Individuals volunteered for the Job Club but had to sign a participation agreement that spelled out the commitment to the program and the ground rules. Since inception, the Job Club has had about 10 participants each session, and completion rates have increased over time.

Essex County agreed to become a pilot site for the ERI given its ongoing interest in employment issues. During the pilot, Angilly administered the ERI to individuals in Job Club as well as to others on probation in the county. Participants took the ERI on a computerized tablet with the ERI loaded on it, and Angilly went over the results with each person upon completion. The consultations generally took about five or ten minutes.

Angilly’s assessment of the ERI was that it helped identify issues to discuss with clients. He envisions continuing to use the tool in the future, because he believed it adds to the county’s current assessment focused on recidivism risks and needs. He has used the ERI’s responses to recommend particular employment-related services tailored to the needs of clients, and when relevant he has shared information with other probation officers who are part of clients’ case management teams.

Despite its ease of use, there were some limitations created by the ERI being exclusively available online. Case managers had to secure access to computer labs or, in settings where clients were not allowed to access computers, Urban’s researchers had to work with practitioners to identify solutions. For incarcerated participants, a practitioner read each ERI question, clients pointed to or stated their responses, and the practitioner clicked the response. In a community corrections office, clients took the ERI on a tablet and reported no difficulty using it. In some rural locations where clients were not as

familiar with computers, case managers reported that clients would have been more comfortable with paper versions of the tool. Other practitioners would have preferred paper versions since they often meet clients outside office settings in places without access to computers. One rural case manager suggested that clients be offered a link that would allow them to take the ERI from home because most meetings occur via phone rather than in person.

Other reported difficulties were that some clients had limited reading ability or were not willing to discuss their responses to the ERI. Although the ERI had been assessed at a 6th-grade reading level, for participants who had lower reading ability, case managers had to read each question to the client. For participants with limited English proficiency, one case manager translated questions into Spanish. This case manager noted that having a Spanish version might make some clients more comfortable when taking the ERI. When clients were uninterested in discussing their ERI responses, case managers encouraged them to talk but did not force them to have conversations.

Overall, practitioners thought that the ERI had strong utility and potential for their work. One case manager reported that the ERI was more useful than another recidivism risk assessment tool currently in use because it better captured clients' substance use and employment experiences. Other case managers thought that it helped identify deeper issues, not just surface-level ones, and made it easier to discuss these issues and develop a realistic service plan with the clients' input. The feedback of practitioners suggested that the ERI, when implemented with motivational interviewing and cognitive behavioral techniques learned through NIC's Employment Retention Specialist training, could be a useful case management tool.

Use of the ERI in correctional facilities presented the most challenges; this may not be surprising since the tool was not originally designed for that population. The use of the tool in a correctional setting introduced several issues that should be addressed, including the rewording of some questions, before the tool is adopted more widely for this population.

Employment and Recidivism

We assessed the connection between study participants' employment status at the time of taking the ERI (baseline) and follow-up approximately three to six months later, and recidivism events occurring during the follow-up period. Some practitioners collected employment information at several points during the follow-up period for some participants, while others checked in with participants only once. The amount of time that passed between the administration of the ERI and the final (or only) check in ranged from 5 to 177 days, with an average of 78 days. This analysis of recidivism examined study participants who were incarcerated separately from participants who were in the community.

Recidivism Among Community-Based Participants

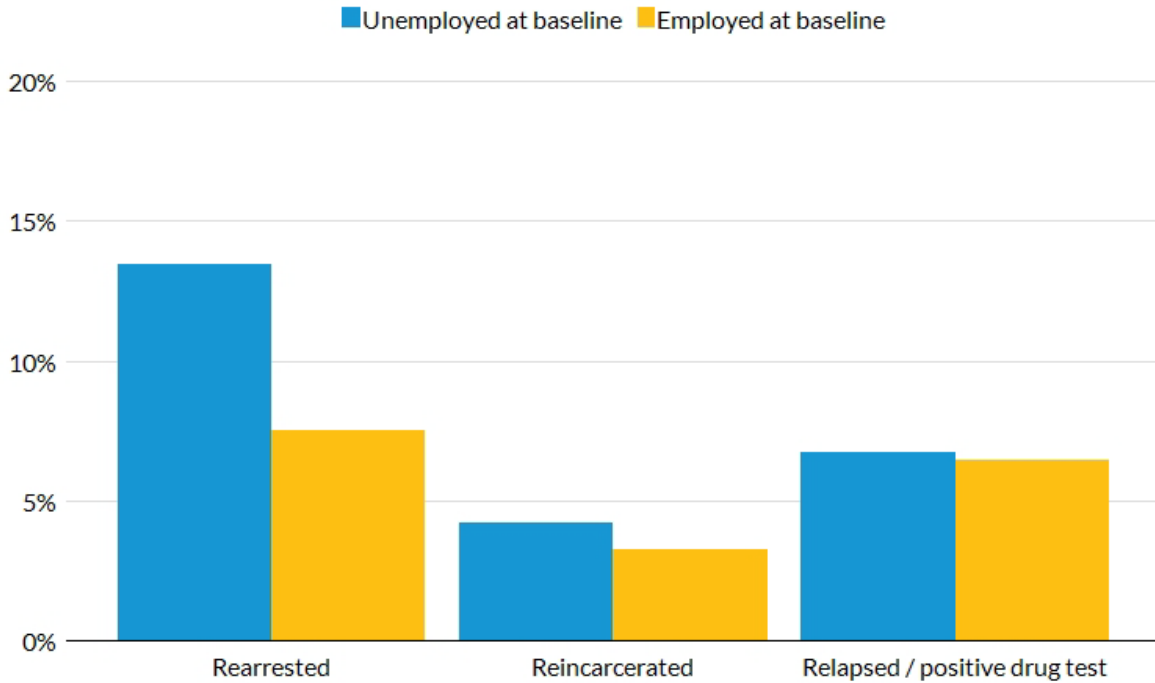
For ERI replication validation participants in the community ($n = 213$), recidivism events included rearrest and reincarceration in all sites, and relapse/failing a drug screening in one site. Arrest and reincarceration data were requested from all sites. While drug screening and relapse information was not a required field, several sites provided this information in case notes. The rate of recidivism among participants was relatively low, with just 15 percent recidivating within six months of taking the ERI or at the time of their last check-in.

Recidivism and Baseline Employment

The rate of recidivism was higher among participants who were unemployed at the baseline (17 percent) than those who were employed (13 percent), though this difference did not reach statistical significance. Figure 7 shows the recidivism rate by type of recidivism and employment status at baseline.

FIGURE 7

Rates of Rearrest, Reincarceration, and Relapse/ Positive Drug Test by Employment Status at Baseline



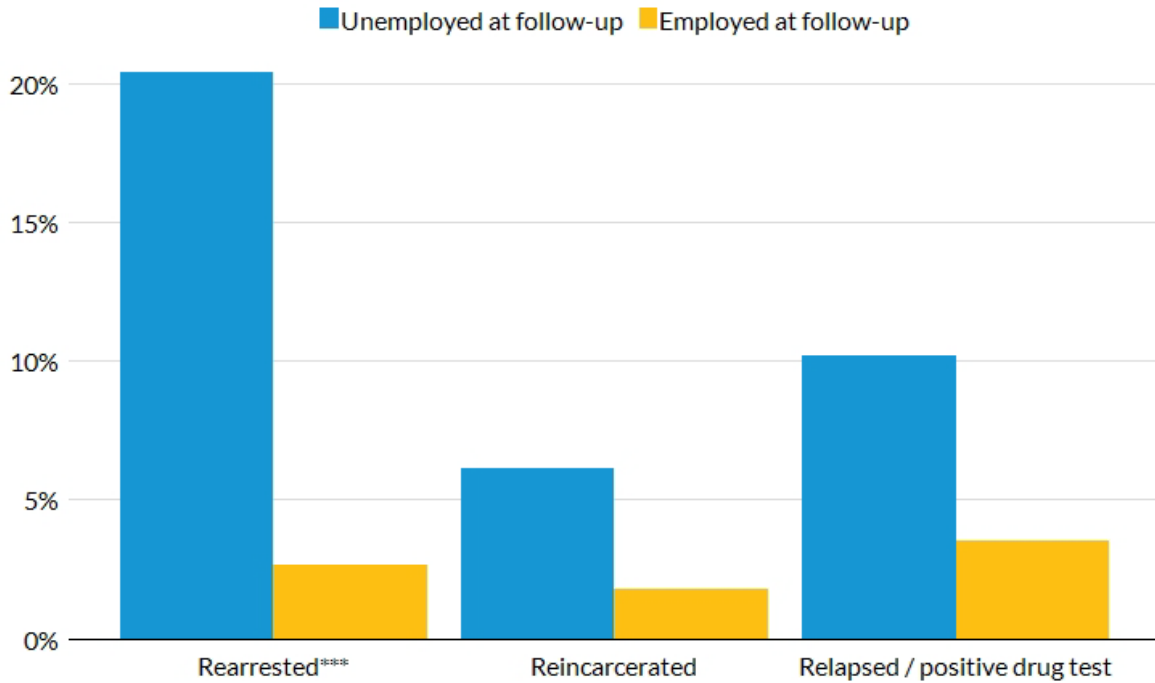
Notes: Chi-squared (default) and Fisher's exact (when *n* of any group considered was < 5) tests were used to determine statistical significance. No differences are statistically significant at the $p < .10$, $p < .05$, $p < .01$, or $p < .001$ level.

Recidivism and Follow-Up Employment

The rate of recidivism was much higher among participants who were unemployed at the follow-up (25 percent) than those who were employed (6 percent). Figure 8 shows the recidivism rate by type of recidivism and employment status at follow-up. The relationship between rearrest and employment at follow-up reached statistical significance.

FIGURE 8

Rates of Rearrest, Reincarceration, and Relapse/ Positive Drug Test by Employment Status at Follow-Up

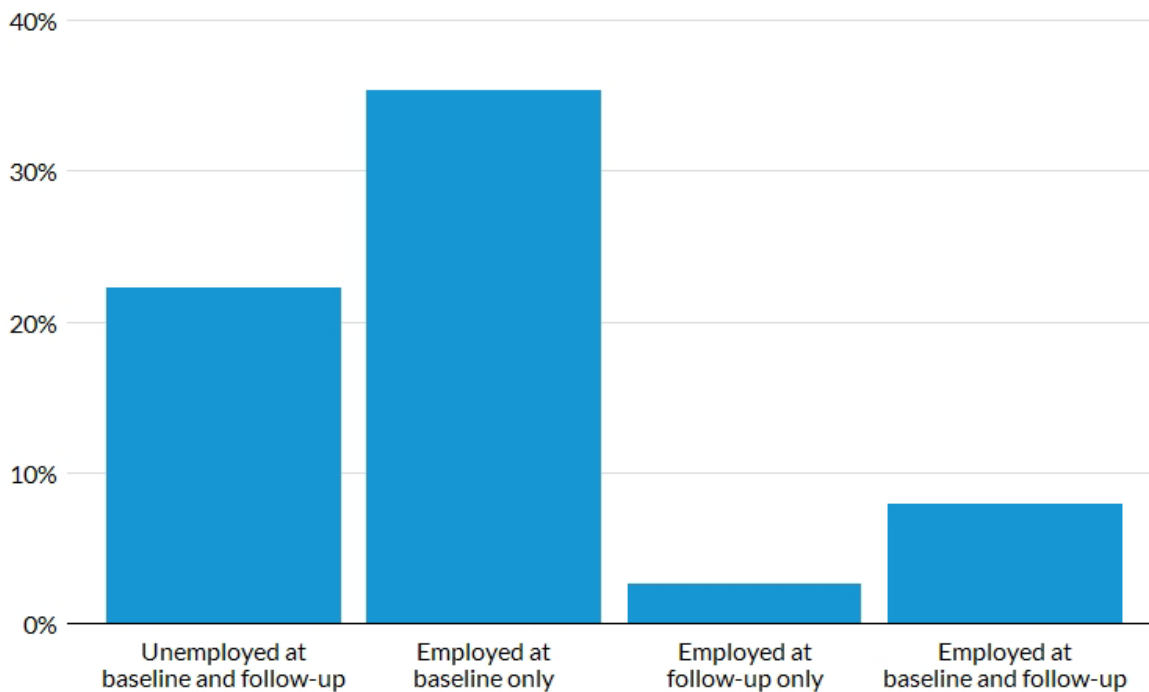


Notes: Chi-squared (default) and Fisher's exact (when n of any group considered was < 5) tests were used to determine statistical significance.

*** Difference is statistically significant at $p < .001$. No differences are statistically significant at $p < .10$, $p < .05$, or $p < .01$ level.

Recidivism rates varied substantially when employment status at baseline and follow-up were considered together. As shown in figure 9, the highest rate of recidivism was for participants who had employment at baseline but failed to retain employment at follow-up. The next highest rate was for participants who were not employed at either baseline or follow-up. Participants who retained employment throughout the study period and those who were employed at follow-up showed the lowest recidivism rates.

FIGURE 9
Recidivism Rates by Employment at Baseline and Follow-Up***



Notes: The recidivism rate is combined from the rearrest, reincarceration, and relapse/failed drug test rates. Chi-squared (default) and Fisher’s exact (when *n* of any group considered was < 5) tests were used to determine statistical significance. Statistically significant differences shown at † *p* < .10, * *p* < .05, ** *p* < .01, *** *p* < .001.

Recidivism Among Incarcerated Participants

For people who were incarcerated (*n* = 77), recidivism was defined as committing a conduct violation as defined by the Indiana Department of Correction (IDOC). The recidivism rate among incarcerated participants at follow-up (26 percent) was higher than the recidivism rate among people in the community. However, not all conduct violations would be considered criminal in a non-correctional setting. Conduct violations as defined by IDOC ranged from major offenses (e.g., assault, unauthorized possession of another’s property) to minor offenses (e.g., tobacco possession, being in an unauthorized area).

All 77 incarcerated participants (for whom recidivism data were available) were employed at the time they took the ERI, and 10 participants became unemployed during the follow-up period. The difference in rates of conduct violations was statistically significant between these groups. Eighty percent of participants who became unemployed committed a conduct violation, compared with 18 percent of participants who remained employed.

Discussion

Taken together, findings from the replication validation suggest that the ERI can predict employment retention for different populations in varied jurisdictions and that the impressions of practitioners support its use in accomplishing broader case management goals. The ERI showed strong predictive validity at identifying participants' employment status approximately 3 to 6 months after responding to the tool's questions. According to employment retention literature and clients' own perspectives on employment barriers, the domains included in the ERI tapped conceptually into factors associated with unemployment (or job loss). The replication validation findings largely agree with those from the ERI's initial validation, yet offer stronger support for the tool's ability to predict unemployment risks.

Practitioners thought the ERI had strong utility and potential for their work. Feedback from practitioners suggested that the ERI, when implemented with motivational interviewing and cognitive behavioral techniques learned through NIC's Employment Retention Specialist training, could be a useful case management tool. A few practitioners experienced practical constraints on the ERI's usage in settings where access to computers was restricted, space for private conversations was tight, and client flow was high. However, for most NIC-trained professionals, use of the ERI helped conversations develop into a more consistent case management pattern than those before the ERI's incorporation.

Further, study participants who retained employment showed a significantly lower recidivism rate than those who did not, offering support for NIC's focus on increasing the gainful attachment of justice-involved people to the workforce. As shown in the literature, people who find and sustain employment often have a reduced probability of justice involvement and experience an enhanced quality of life (Caspi, Moffit, and Silva 1998; Kling, Weiman, and Western 2000; Winkelmann 2009).

Participants' responses to an open-ended question about employment barriers suggested the mere presence of a job was not enough to improve financial well-being and life satisfaction. Rather, they desired employment that paid sufficient wages, granted a sense of purpose in its work, and did not discriminate based on prior justice involvement. Notably, both employed and unemployed participants mentioned the effect that community supervision and reentry requirements had on their ability to find and retain work.

This ERI replication validation was not without its limitations. Future validation efforts should attempt to include larger samples of female participants and clients in incarceration settings. Wording of some ERI items might, for example, be altered for specific relevance to those working in correctional

industries while incarcerated. Similarly, child care obligations might be another item added to improve the tool's relevance for community-based clients with childcare responsibilities that affect employment likelihood.

Another limitation is that the varying follow-up periods for individuals may mean that the employment experiences of some participants are underreported or underestimated, while for others they may be over-reported or overestimated. Future studies of the ERI's predictive validity should observe clients' employment experiences over longer and more consistent periods of time than allowed in the current study's three- to six-month timeframe. Further, the ERI might be administered repeatedly to clients to better capture the dynamic nature of their life circumstances.

Based on practitioners' feedback and Urban's researchers' observations, we note that before deciding to incorporate use of the ERI and NIC's Employment Retention Specialist trainings, jurisdictions might want to consider the following questions:

- *Has your agency met the prerequisites to administer the ERI, in that staff have been trained by NIC as Employment Retention Specialists and clients have access to computers, a private space and sufficient time to hold ERI-focused conversations?*
- *How well does your agency address employment retention issues of your clientele, and why are you considering a new tool? What assessments, if any does your agency currently use and does the ERI address a gap, by focusing specifically on unemployment risks?*
- *What population(s) are you serving and are they well-matched to the ERI? The ERI replication validation shows a clear link to employment for community corrections populations, but further research is needed to specify its value to incarcerated clients.*

Overall, ERI validation analyses coupled with practitioners' feedback suggests that the ERI, when implemented with motivational interviewing and cognitive behavioral techniques learned through NIC's Employment Retention Specialist training, could be a useful case management tool for community correctional populations. Although case managers often use recidivism risk assessment tools, the ERI is a unique addition to actuarial assessments because it looks specifically at employment-related risks. Ultimately, the ERI provides practitioners with a solid and consistent tool to identify dynamic factors related to unemployment risks, which they can use when helping clients understand how to address and overcome those risks.

Appendix A. Model Development

Quantitative analyses supporting the ERI's replication validation relied on regularized Lasso logistic regression to calibrate the ERI to predict risk of unemployment. The outcome variable was employment status at the last check-in within six months of taking the ERI. The predictor, or explanatory, variables came from the items on the ERI.

The 46 predictor variables were the means of each of the 7 ERI domains, as well as the overall mean, interactions of domain means, two 10-point scale items at the end of the ERI and their interaction, and the employment status of the participant when taking the ERI. No other information about the participants, such as age, race, gender, or criminal history, was included in the model.

Before developing the model, Urban's researchers randomly split the data into "training" and "test" data sets. The training set included 70 percent of data observations, while the test set had 30 percent of data observations, proportions commonly used for predictive modeling (Langford 2005; Weinberger and Saul 2009). Both these sets had similar rates of unemployment at the time of taking the ERI and at follow-up. The model was created using the training set and then the ERI's predictive performance was evaluated on the test set. Splitting the data into two sets is common in predictive modeling, and helps ensure that the model does not overfit the training data by allowing it to be tested on data that the model has not seen (Kuhn and Johnson 2013).

The model was developed using the caret package in R, a free programming language used for statistical computing. Urban's researchers performed a three-fold cross validation when developing the model on the training set. We optimized the model on area under the curve, while being mindful of the sensitivity and specificity to ensure that the model identified as many true positives and true negatives as possible. We developed three separate models for participants from the first study, the current study, and both studies combined. In all models, we only included participants based in the community. We tested incarcerated participants separately, because their answers to the ERI were dissimilar to community-based participants and the sample size was relatively smaller.

We used a predicted probability of unemployment above 0.5 to classify participants as being at risk of unemployment. For the model developed on participants of the first ERI study, who were all employed when they took the ERI, the cut point was set at 0.21 to match their overall lower risk of unemployment.

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