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## NATIONAL INSTITUTE OF JUSTICE

SEPTEMBER 2024

# 2023 REVIEW AND VALIDATION OF THE FEDERAL BUREAU OF PRISONS NEEDS ASSESSMENT SYSTEM



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## Executive Summary

Title I of the First Step Act of 2018 (FSA) required the Attorney General, in consultation with the Federal Bureau of Prisons (FBOP) and the National Institute of Justice (NIJ), to develop and implement a risk and needs assessment system. In 2020, the Prisoner Assessment Tool Targeting Estimated Risk and Needs (PATTERN) was developed and implemented, with the intent of assessing recidivism risk and determining eligibility for early release time credits outlined by the FSA. Also mandated was the development of a dynamic needs assessment system. Utilizing existing and validated assessment items and scales, the FBOP created the Standardized Prisoner Assessment for Reduction in Criminality (SPARC-13), which consists of 13 domains: Anger/Hostility, Antisocial Peers, Antisocial Cognition, Education, Family/Parenting, Finance/Poverty, Medical, Mental Health, Recreation/Leisure/Fitness, Substance Use, Trauma, Work, and Dyslexia<sup>1</sup> (Federal Bureau of Prisons, 2022).

Section 3631 of Title I of the FSA requires that both the PATTERN and SPARC-13 be reviewed and validated on an annual basis. To help fulfill these requirements of the FSA, NIJ announced a competitive Consultant Statement of Work (SOW) and selected three consultants to conduct the annual review and revalidation of the SPARC-13. NIJ contracted with Dr. Grant Duwe, Dr. Zachary Hamilton, and Dr. Alex Kigerl to review and revalidate the SPARC-13.<sup>2</sup> The FSA further specifies that the SPARC-13 must be released publicly on the U.S. Department of Justice website, and its review and validation shall include:

- A. any subsequent needs assessment system changes made after the date of enactment of [the FSA],
- B. recommendations proposed for the SPARC-13,
- C. an evaluation to ensure the SPARC-13 system bases the assessment of each individual's progress and of regression using dynamic indicators and that can reasonably be expected to change while in prison,
- D. statistical validation of the needs assessment system, and
- E. an evaluation of the rates of recidivism to identify any unwarranted disparities, including disparities among similarly classified incarcerated individuals of different demographic groups.

The current report reviews and validates the SPARC-13 by conducting analyses relating to internal content, convergent/divergent, latent structure, and concurrent validity. The report also presents the results from a process evaluation of the FBOP's development and implementation of the SPARC-13.

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<sup>1</sup> Per FSA requirements, Dyslexia is included in the SPARC-13 but was not a need previously assessed by the FBOP.

<sup>2</sup> For more details on the competitive consultant SOW and selection process, see pages 23 – 24 of the U.S. Department of Justice (USDOJ). (2022, April). [First Step Act Annual Report](#).

## *Process Evaluation Findings*

To achieve a better understanding of the development and implementation of the SPARC-13, NIJ consultants reviewed internal agency documents and interviewed key FBOP staff. Prior to the SPARC-13's debut in 2020, the FBOP had a mixture of standardized and non-standardized processes, some of which staff described as "less formally structured" with regard to the process for assessing needs and creating program referrals. In particular, standardized and centralized processes were used by the FBOP when assessing Substance Use, Education, Trauma, and Mental and Physical Health prior to the SPARC-13. Needs for the other eight domains were either not assessed or not fully integrated into case plan and program referral decisions. Because these decisions were not informed by results from a needs assessment, individuals confined in the FBOP typically requested program referrals based on a combination of staff recommendations, associated incentives, and their own interests. Moreover, program participation has always been voluntary. Therefore, without an understanding of individuals' level of need, selection bias is a potential issue, whereby those participants who "opted-in" may consist of the most motivated, eager individuals in the FBOP's custody. Prior research has indicated that self-selection for program participation can result in a lower risk/lower need population of participants (Kiluk et al., 2015; Logan et al., 2004).

During the creation of the SPARC-13, the FBOP held a symposium in 2019 attended by corrections scholars and practitioners to help identify common areas of need relevant to incarcerated individuals. For areas such as Education, Medical, Mental Health and Substance Use, the FBOP used assessment processes that existed prior to FSA. For some of the other domains that were identified, the FBOP identified validated, public domain assessments or modified its existing assessment processes. For example, the FBOP selected the adverse childhood experiences (ACEs) scale developed and validated by Felitti et al. (1998) to measure Trauma. For Anti-Social Cognition and Peers, the FBOP selected the Measures of Criminal Attitudes and Associates (MCAA) created by Kroner and Mills (2003). The FBOP decided to use the Brief Anger-Aggression Questionnaire (BAAQ) developed by Mauiro et al. (1987) to measure Anger/Hostility and the 12-item screening tool, the McMaster Family Assessment Device (FAD-12; Epstein et al., 1983) to measure Family/Parenting.

For the Work and Finance/Poverty domains, FBOP staff have continued to conduct a review of the Presentence Investigation Report (PSR). The need determination for the Recreation/Leisure/Fitness domain has been made by the FBOP's Health Services Division. Finally, for Dyslexia, individuals in the FBOP's custody have completed a dyslexia screening instrument and, depending on the results, may be administered a psychometric test capable of providing a formal diagnosis.

The FBOP encountered several challenges during initial implementation of the SPARC-13 relating to resources, staff workload, training, and communication. We note these issues are common when implementing a new assessment and the accelerated pace at which the FBOP was mandated to develop and deploy the SPARC-13 likely contributed to these challenges. With that said, the new and largely unfamiliar tasks and responsibilities associated with using the SPARC-13 resulted in an increased workload for existing staff. Due to these additional challenges and

resource restrictions, reassessments of needs domains are *not completed* by readministering the psychometric assessments. Instead, the FBOP determines whether needs have been met by reviewing records regarding behavior in prison and the completion of relevant programs and interventions. In addition, the degree to which FBOP staff and incarcerated individuals have been responsible for completing the SPARC-13 has varied among self-assessment, staff review of the PSR, and manual data entry. Process evaluation interviews indicated greater training on the risk-needs-responsivity (RNR) may be needed to further improve the processes and use of the SPARC-13.

During the initial implementation, senior-level FBOP staff provided training to facility staff, much of which was delivered virtually. One common concern expressed by FBOP staff involved the changing guidance that staff were given during the implementation of the SPARC-13. Most of these changes related to how staff should submit the assessments in an attempt to reduce staff workload and create efficiencies to meet FSA deadlines. Notably, the implementation of the SPARC-13 led to policy changes that required updates and multiple changes in processes. While potential barriers and efficiencies are often difficult to foresee, growing pains such as these are common for most agencies implementing a new assessment. To overcome these challenges, FBOP created internal webpages to direct staff to needed information and policies in a centralized location.

Despite the challenges involved with implementing the SPARC-13 across the FBOP, staff reported that FSA and, in particular, its mandated risk and needs assessment process had brought about some clear benefits. While there was a lot of subjectivity in the formation of reentry plans and program referrals prior to FSA, the implementation of the PATTERN and SPARC-13 has given the FBOP a more standardized assessment process. Indeed, fewer needs were assessed prior to FSA, and the results from this less formally structured process had an uncertain influence on the development of reentry plans and program referrals. Reentry plans were developed through meetings between incarcerated individuals and their unit teams (unit manager, case manager, and counselor) in which program referrals were driven by the incarcerated person's interests and unit team member's expertise, as opposed to their assessed needs. Individuals admitted to the FBOP's custody undergo orientation on the first day and are now informed they need to complete their SPARC-13 assessments within four weeks. On (or around) day 28, which is when residents traditionally have their first unit team meeting, the unit team reviews the assessment results and develops a reentry plan.

Providing training on risk and needs assessment and, more broadly, the RNR model has also equipped staff with knowledge about who should be prioritized for programming and what areas should be targeted to minimize recidivism risk. Further, FBOP staff have observed an increased interest in program participation among individuals in prison, which is a direct byproduct of the FSA's early release incentive. Specifically, because programming needs are assessed by the SPARC-13 and participation contributes to reductions in scores and risk levels on the PATTERN, individuals are more motivated to participate in programming, reduce their risk, and earn early release time credits.

Due to the accelerated timeframe for developing and implementing the needs assessment system, the FBOP lacked sufficient time with which to create an optimal tool for the FBOP

population and develop buy-in and training for current scales and procedures. FBOP staff indicated that limited training and funding resources are ongoing challenges affecting the implementation of the SPARC-13. Further, because many of the scales were selected based on ease of implementation and the use of existing assessment tools, referral processes, and programming, staff interviewed perceived the SPARC-13 as “in need of improvement.” When asked directly how to improve the tool, some suggested the need for a major revision to the current scales, others indicated the need for better quality control for data collection procedures, while others suggested improved technology, training, and feedback mechanisms to support case management.

### **Statistical Validation of the SPARC-13**

The FSA requires the U.S. Department of Justice to conduct an annual statistical validation of the needs assessment system. Although rearrest data were not available for this year’s report, which precluded an evaluation of the SPARC-13’s predictive validity, these data will be analyzed in future review and revalidation reports. Despite this limitation, we completed several assessments of construct validity, including concurrent/divergent, internal structure, and concurrent validity. Further, we assessed the use of interventions and programming in addressing identified needs.

#### *Convergent/Divergent Validity*

Needs assessment instruments generally have domains, or subscales, that provide a latent measure of the purported relationship with recidivism. For latent scales, it is necessary to evaluate aspects of construct validity, ensuring the items measure what they intend to measure. As part of the validation procedures, we examined the needs assessment domains for elements of construct validity. Of particular importance is convergent/divergent validity, where domain items are tested to ensure that items in one domain similarly measure the same construct and do not provide overlapping content with another SPARC-13 domain. Among the 13 domains on the SPARC-13, only five represent latent scales with the ability to be evaluated using psychometric standards. Further, because these scales were adopted ‘off-the-shelf’ from existing scales that were developed independently from each other, there was a reduced expectation of this element of construct validity. Accordingly, tests of convergent/divergent validity did not meet established psychometric standards.

#### *Internal Structure Validity*

The three components of internal structure validity include dimensionality, scale reliability, and measurement invariance. We examined the internal structure validity of the five domains to determine whether item content within a given domain is measuring the construct consistently, as intended, and similarly across key sup-groups. The findings revealed the Anger Domain scale (BAAQ) and the Trauma Domain scale (ACEs) exceeded industry standard thresholds, but the Family Domain scale (FAD-12) and MCAA scales for Peers and Cognitive domains did not. Findings were also mixed for internal reliability, where again the Anger (BAAQ) and Trauma (ACEs) exceeded industry standards. Finally, these two scales also identified measurement invariance, indicating relatively equal measurement across gender and

racial subgroups. The selected assessments used to measure Family, Peers, and Cognitive domains *do not* meet industry psychometric standards for use with those under FBOP custody, which indicates that, at least for this population, the assessment scales are not accurately measuring the programmatic needs as intended. Further, a lack of invariance suggests the scales differently measure needs across race and gender subgroups, representing a potential source of bias and overclassification. However, these are only a few tests of construct validity, and additional testing still needs to be conducted to assess the predictive accuracy of scales and the extent to which overclassification is present.

### *Concurrent Validity*

Concurrent validity assesses the agreement between two different, yet similar, outcomes. To evaluate the SPARC-13's concurrent validity, we examined whether its domains are measures of criminogenic needs by assessing their association with the PATTERN, which has been shown to provide an accurate assessment of recidivism risk for the FBOP population. The results from the concurrent validity analyses provide mixed support for the domains on the SPARC-13. Small effect sizes were found for the Anger, Antisocial Cognition, Education, Substance Use, and Work domains, while the remaining eight domains did not meet the small effect size threshold for both concurrent validity metrics. There was relatively little overall variation by gender and race/ethnicity, although a notable difference was observed between men and women for the Education domain. That is, a 'Yes' rating for the Education domain was associated with a higher risk level on the PATTERN for men but not for women.

The results also suggest the 'yes/no' need rating threshold may need to be adjusted for five domains. Antisocial Peers, Parenting/Family, and Trauma did not have an association with recidivism risk when analyzing these domains with the binary rating. Yet, when we analyzed their association with the full range of scores, all three domains achieved small effect sizes. Moreover, the area under the curve (AUC) values increased for the Anger and Antisocial Cognition domains when using the full range of scores, with the latter having a medium effect size.

### *Needs and Program Assignments*

Among the 13 domains assessed by the SPARC-13, Work is the most identified need for the FBOP population, followed by Substance Use. Dyslexia (3%) is the least common need, along with Mental Health (4%). Compared to men, women were much more likely to have needs for trauma and mental health. Men, on the other hand, were more likely to have a need for the Anger domain. Racial differences were minimal overall, although incarcerated individuals identifying as Black and Native American were about 50% more likely to have a need for the Anger domain than individuals identifying as White and Asian.



**Table 1. SPARC-13 Needs and Program Assignments**

<b>Domain</b>	<b>Program Matched to Need</b>	<b>Unassigned/Program Not Matched to Need</b>
Dyslexia	0.2%	99.8%
Anger	1.7%	98.3%
Financial	2.7%	97.3%
Parenting/Family	2.8%	97.2%
Education	3.8%	96.2%
Antisocial Peers	4.0%	96.0%
Trauma	4.4%	95.6%
Mental Health	6.5%	93.5%
Work	7.2%	92.8%
Medical	7.8%	92.2%
Recreation	7.9%	92.1%
Antisocial Cognition	8.3%	91.7%
Substance Use	11.4%	88.6%

Table 1 shows the percentage of individuals in FBOP custody participating in programming that addressed a need that had been identified by the SPARC-13. As shown in the table most individuals in the FBOP’s custody were not currently enrolled in programming that targeted their assessed needs. This finding is explained in part by the sequencing of program referrals, participant waitlists, and the duration of an individual’s sentence. Further, for some programs (i.e., Residential Drug Abuse Treatment), programming is designed to be delivered at the end of an individual’s sentence to better support post-release recovery and sober living practices. With that said, 11% of the incarcerated individuals with a Substance Use need were involved in programming that addressed this need, which was the highest rate among the 13 domains. The results also show that Dyslexia had the lowest rate, with 0.2% of incarcerated individuals involved in programming that addressed this need. More detailed data and analyses will be needed to more fully determine whether the FBOP has sufficient programming to address identified needs and if programming provided impacts both future needs and recidivism upon reentry.

### *Recommendations*

In addition to the statistical validation, the FSA requires that recommendations should be developed on the basis of the evaluation findings. Given that we were unable to evaluate the SPARC-13’s predictive validity for this year’s report due to the absence of recidivism data, our recommendations are limited. Still, the results from the other analyses highlight several areas that will likely be the focus of future recommendations. In the event that the predictive validity findings are similar to those for concurrent validity, which is very likely due to the PATTERN’s high level of predictive accuracy, we anticipate it will be necessary to adjust the need thresholds for some of the domains. It may also be necessary to reduce the SPARC-13 to a more strategic set of criminogenic domains that are affected by evidence-based programming. Recidivism data

collected and analyzed in Year 2's evaluation will be used to support or refute this potential recommendation area.

The following recommendations are offered to enhance future evaluations of the SPARC-13, improve use of the instrument by the FBOP and, ultimately, lead to the development and implementation of a unified risk and needs assessment system that is consistent with the FSA:

- 1) **Improve current information technology.** The consensus among the key FBOP staff interviewed for this report is that the SENTRY system, a decades-old management information system, was not designed to integrate a new needs assessment platform. While it is commendable that the FBOP managed to incorporate the SPARC-13 assessments and data collection procedures within the existing SENTRY system, SENTRY is not a modern or efficient system for collecting assessment data and tracking individual's progress over time. In order for the SPARC-13 to achieve its full potential, we believe it will be necessary for the FBOP to update or replace the current information technology system for the collection of assessment and programming data.
- 2) **Provide the SPARC-13 revalidation team with access to more detailed data.** Additional data will be needed to not only fully evaluate the SPARC-13, but also to meet the requirements for FSA. In addition to recidivism data, which are necessary to evaluate the SPARC-13's predictive validity, more detailed data on PATTERN scores and item values will be needed to recommend improvements.
- 3) **Change SPARC-13 ratings from binary to ordinal.** Our analyses suggest that it may be advantageous for the SPARC-13 to transition from a binary yes/no needs rating scheme to an ordinal framework that consists of at least three categories (e.g., high, medium, and low). A more refined rating of need will assist case managers in identifying the appropriate intensity of programming where a variety of levels are available (i.e., drug education, outpatient, and residential substance use treatment). An ordinal rating system would provide both incarcerated individuals and staff with greater clarity on which needs should be prioritized for programming.
- 4) **Examine reliability of assessments performed by staff.** Future evaluations of the SPARC-13 should examine inter-rater reliability (IRR) for the domains assessed by FBOP staff. Evaluating whether staff are consistent in their assessments of these domains comprises a key element of the SPARC-13's performance. Perceived as a precursor to predictive validity, IRR analyses are used to identify potential inconsistencies in how staff administer ratings for these domains, and areas in need of adjustment to improve the performance of the SPARC-13.
- 5) **Make greater use of validated assessments.** The FBOP should consider using validated, off-the-shelf assessments for at least some of the domains currently rated by FBOP staff. For example, standardized assessments are available for Substance Use, and the FBOP should more fully integrate the Test for Adult Basic Education (TABE), a standardized education assessment, in the need ratings made for the

Education domain. By doing so, the FBOP may be able to address the gender disparity from the concurrent validity results that was observed for the Education domain.

- 6) **Conduct reassessments of key domains.** Best practice dictates that reassessments of key domains should be done to identify which criminogenic needs are decreasing and their impact on both calculated risk and infraction behavior. Further, reassessments provide key indicators of progress as individuals engage with programming and services.
- 7) **Align staffing levels to enhance implementation of the SPARC-13.** Performing reassessments on key domains may require additional resources and substantial adjustments to current FBOP practices. Routine administration of the SPARC-13 scales is labor-intensive but necessary. Because current staffing levels may be lacking to enhance implementation of the FBOP's needs assessment system, additional staffing resources may be needed in order for the SPARC-13 to achieve its full potential.
- 8) **Align programming with assessment scales.** The evaluation findings suggest that more programming resources may be needed to adequately meet the needs of the FBOP population. In addition, it may be necessary to adjust the current scales and provide measures that are more in line with the FBOP population and programming.
- 9) **Support additional training to facilitate use of RNR principles and skills.** Because RNR principles are foundational to successfully implementing the SPARC-13, it will be critical to provide case managers with refresher training on the RNR model to facilitate the continued use and development of these skills. During the process evaluation, we learned of ongoing training efforts that followed the implementation of the SPARC-13. Further examination of these efforts will be documented and included as part of Year 2's report.
- 10) **Combine SPARC-13 and PATTERN into a unified risk and needs assessment system.** To improve FBOP practice and, presumably, the outcomes for individuals in FBOP's custody, the SPARC-13 and PATTERN should operate in tandem. The FBOP currently has the foundation for a unified risk and needs assessment system that meets its needs and provides a model that is consistent with the FSA's intent and correctional best practices. Following further refinement, testing and validation of the SPARC-13 and PATTERN, it will be beneficial to eventually combine the elements of the SPARC-13 and PATTERN to form a cooperative risk and needs assessment system.

## Introduction

Since its development more than 30 years ago by Bonta and Andrews (2017), the risk-needs-responsivity (RNR) model has been the prevailing paradigm used to guide the delivery of programming to correctional populations. The risk principle holds that higher-risk individuals should be prioritized for interventions, with the most intensive programs being reserved for people with the highest recidivism risk (Sperber, Latessa, & Makarios, 2013). According to the needs principle, programming must address dynamic, individual characteristics that are related to criminal behavior (i.e., criminogenic needs), whereas the responsivity principle indicates that programs must account for factors that influence effectiveness.

Under the RNR framework, risk factors have been characterized as major, moderate, and minor (Andrews, Bonta, & Wormith, 2006). The four major risk factors (i.e., the ‘Big Four’) include a history of antisocial behavior, antisocial personality pattern, antisocial thinking, and antisocial peers (Andrews et al., 2006). Of the ‘Big Four’, a history of antisocial behavior (i.e., criminal history) is static, whereas the others are dynamic needs areas. Moderate risk factors include substance use, education/employment, family/marital relationships, and leisure/recreation, while areas such as major mental disorder and social class are considered minor risk factors that generally have a modest association with recidivism (Andrews, Bonta, & Wormith, 2006).

A key distinction between criminogenic needs and responsivity factors lies in the impact each one has on recidivism. A criminogenic need will have a substantial, direct impact on reoffending, and interventions that successfully target this need will reduce recidivism. For example, substance use is a criminogenic need with a significant, direct impact on recidivism (Gendreau et al., 1996), and substance use disorder treatment has been shown to reduce reoffending (Mitchell et al., 2007). Specific responsivity factors, on the other hand, will have a more modest, indirect impact on reoffending that is moderated by other factors. Examples of specific responsivity factors, which may influence whether individuals are able to successfully complete programming that targets criminogenic needs, include motivation, anxiety, different forms of learning styles, language, transportation, gender, and culture (Cullen, 2002).

Grounded in RNR principles and the General Personality and Cognitive Social Learning (GPCSL) theory, risk and needs assessments (RNAs) are designed to predict recidivism (i.e., risk) and identify the areas to be addressed through programming (i.e., needs). While risk is estimated via a variety of item types, needs factors are dynamic, or functionally changeable over time, and amenable to services and interventions. RNAs are intended to guide the classification of individuals’ level of supervision and programming, with the objective of reducing risk (Andrews & Bonta, 2010). Over the past four decades, the utilization of RNAs has expanded to nearly every state and justice population (Juvenile Justice Geography & Policy Practice and Statistics, 2020).

After nearly quadrupling in size from the 1980s through the late 2000s, state and federal prison populations have mostly been on the decline over the last 15 years. While many jurisdictions were initially compelled to reduce the overall size and cost of their prison populations in response to the COVID-19 pandemic, limited bed space capacity and tight

budgets brought on by the Great Recession, the topic of prison reform has continued to attract a great deal of interest and concern. Reform efforts have generally sought to decrease the number of people in prison while, at the same time, retaining public safety (Clear & Schrantz, 2011; Cohen, 2019).

Providing people in prison with risk-reduction programming and the potential for early release has been identified as a promising decarceration strategy (Clear & Schrantz, 2011). As a result, many states have reduced sentence lengths, removed mandatory minimums, and established early release policies and programs (Taxman, Pattavina, & Caudy, 2014). Along with reducing incarceration durations for lower-risk individuals, many of these efforts have focused on providing early release to more people in prison by lowering their recidivism risk through the delivery of effective programming.

For both efforts—identifying people for early release and providing risk-reduction programming—creating and/or adopting valid tools is a foundational step. In general, risk assessments combine the effects of several measures to form a single score, which represents a person’s probability of recidivism. Needs assessments, on the other hand, are designed to be comprised of only dynamic, or changeable, items and responses. In addition, these items are meant to be criminogenic, or have an empirical relationship to recidivism, where an observed reduction in needs following reassessment should predict a reduced recidivism likelihood. Finally, needs assessments typically consist of a series of scales, or domains.

These domains are comprised of a cluster of items that measure a singular construct representing a ‘criminogenic need,’ or a dynamic composite score with the potential to change following intervention. Common domains include family, aggression, education, employment, mental health, substance use, friends/associations, criminal cognitions, residence, and reentry concerns. Each need domain is scored, where individuals with higher scores are prioritized and targeted for risk reduction programming that address the issues and concerns outlined by a given domain. However, because domains are comprised of multiple items, summed to represent the magnitude of need, each is considered a ‘latent construct’ and possesses an indirect relationship with recidivism outcomes. To demonstrate that a needs assessment is appropriate for use, psychometric industry standards must be achieved to establish construct validity (AERA, APA, & NCME, 2014).

### **Federal Bureau of Prisons (FBOP) and the First Step Act (FSA)**

In December 2018, Congress passed the First Step Act (FSA), which sought to reduce the FBOP population in two ways. First, incarcerated individuals identified as Low or Minimum risk became eligible for early release time credits, effectively reducing the sentence durations and, in turn, the size of the incarcerated population. Second, risk reduction programs were to be used and prioritized for people who were not yet eligible for FSA early release time credits. In this way, the FSA incentivized participation in programming (U.S. Department of Justice, 2019).

Prior to the enactment of the FSA, the FBOP had used assessments for risk of prison misconduct (e.g., Bureau Risk and Verification Observation—Recidivism [BRAVO]) and criminogenic needs such as education and substance use disorders (Hamilton et al., 2021). Given

that the FBOP's assessments were non-existent for recidivism risk and limited for criminogenic needs, the FSA authorized the Department of Justice (DOJ) to implement assessments that predicted recidivism and identified criminogenic needs for the federal prison population (U.S. Department of Justice, 2019). The National Institute of Justice (NIJ), directed by the U.S. Attorney General, oversaw the development of a risk assessment instrument and the evaluation of the criminogenic needs tool – the Standardized Prisoner Assessment for Reduction in Criminality (SPARC-13).

During 2019, the FBOP and NIJ researchers created the Prisoner Assessment Tool Targeting Estimated Risk and Needs (PATTERN), the instrument designed to predict recidivism for the federal prison population. Developed and validated on a large sample (N=222,970) of individuals released from federal prison between 2009 and 2015, the PATTERN is a gender-specific instrument using static and dynamic items to assess general and violent recidivism. Using a two-stage validation procedure, boosted regression, and multiple performance metrics, results reported by Hamilton and colleagues (2021) showed that the PATTERN achieved a high level of predictive validity. Following the implementation of the PATTERN, NIJ selected a team of researchers to revalidate the instrument. When revalidated on people released from the FBOP from 2016 to 2018, the most recent report by the PATTERN revalidation team showed it has retained its high level of predictive accuracy (National Institute of Justice, 2023).

In addition to implementing the PATTERN, the FBOP developed a needs assessment system in 2020 in order to meet the FSA requirements. In collaboration with DOJ and the FSA's Independent Review Committee (IRC), the FBOP created the SPARC-13 (Federal Bureau of Prisons, 2022). The SPARC-13 was designed to capture 12 criminogenic need domains: Anger/Hostility, Antisocial Peers, Cognitions, Education, Family/Parenting, Finance/Poverty, Medical, Mental Health, Recreation/Leisure/Fitness, Substance Use, Trauma, and Work. A 13th domain—Dyslexia—was also included, as stipulated by the FSA, but, to date, is not identified as a criminogenic need (Federal Bureau of Prisons, 2022).

The SPARC-13 consists of a series of assessments, some of which were existing tools designed to measure specific needs. For example, the Antisocial Peers need and Cognitions need are assessed by the Measures of Criminal Attitudes and Associates (MCAA) that was originally developed by Mills and Kroner (2001). Likewise, the Anger/Hostility need is assessed by the Brief Anger-Aggression Questionnaire (BAAQ), which has previously been identified as reliable and valid tool by Mauro et al. (1987).

Information for some needs is drawn from the comprehensive legal and social history in the Presentence Investigation Report (PSR) completed by probation officers. Other needs require educational assessments, such as the Test of Adult Basic Education (TABE), or psychological assessments like the MCAA or BAAQ. In general, individuals in prison complete the assessments for Anger/Hostility, Antisocial Peers, Cognitions, and Family/Parenting on the FBOP's inmate-facing computer system. Health Services is responsible for assessment of the Medical and Recreation/Leisure/Fitness needs as part of the intake process. Education staff assess Dyslexia, Education, and Work as part of the intake process. Unit Management assesses Substance Use during initial intake and Finance/Poverty at the first team meeting. Psychology

Services is responsible for the remaining needs areas: Trauma and Mental Health, which are assessed as part of the intake process (Federal Bureau of Prisons, 2022).

According to the report on the initial review of the SPARC-13, a total of 155,551 individuals incarcerated in federal prison were assessed during fiscal year 2021. In addition to providing a breakdown of the completed assessments by gender, race, and ethnicity, the report noted that 113,779 individuals had completed all 13 assessments. Thus, a little more than 40,000 individuals did not complete all 13 assessments, and most of the refusals were tied to the assessments for Antisocial Peers, Cognition, and Trauma (Federal Bureau of Prisons, 2022).

### **Current Report**

While the internal FBOP review of the SPARC-13 provided a foundation of evidence, a more formal annual assessment of reliability and validity is mandated by Title I of the FSA to establish the appropriateness and effectiveness of the tool for the FBOP population. Specifically, the FSA mandates that the 13 scales be statistically validated, which, in regard to a needs assessment system, includes an assessment of reliability and construct validity to ensure that these latent constructs measure what they intend to measure. This requires a variety of industry standard metrics and procedures be completed to assess multiple aspects of reliability and validity, including *convergent/divergent*, *internal structure*, *concurrent* and *predictive validity* (AERA, APA, & NCME, 2014). However, due to the absence of rearrest data, which are needed to examine predictive validity, this year's report will focus on *convergent/divergent*, *internal structure*, and *concurrent validity*. It is anticipated that recidivism data will be available for future reports.

After individuals are assessed on the SPARC-13, results for the 13 domains help inform the development of a reentry plan and the identification of programming targets. It is therefore necessary to evaluate how assessed individuals are prioritized and assigned for programming. To this end, the current report will examine the relationship between the identification of needs on the SPARC-13 and assignment to programming.

Finally, as recent evidence has outlined sources of bias inherent within some assessment tools, the proposed SPARC-13 evaluation will examine potential sources of gender and racial disproportionality as required by Title I. Regarding racial/ethnicity bias, research on PATTERN has identified areas of needed improvement and more extensive evaluation (Hamilton et al., 2021; U.S. Department of Justice [USDOJ], 2021; 2022). Similar evaluations are proposed for each of the SPARC-13 domains to determine potential sources of disproportionality and amelioration strategies. The proposed evaluation of the SPARC-13 will compare relative rates of need by sex, examining potential sources of overclassification among its items and domains.

### **Process Evaluation**

In an effort to achieve a better understanding of the development and implementation of the SPARC-13, we conducted a process evaluation that involved interviewing key FBOP staff and reviewing internal FBOP documents. Due to time constraints, this evaluation was limited to five interviews and focus groups with FBOP staff who held case manager, treatment coordinator,

research, and managerial positions. FBOP staff involved in the process evaluation represented an adequate cross-section of expertise, some with direct knowledge of SPARC-13 development, implementation, and data collection processes. In addition to completing approximately 10 hours of focus groups, interviews, and meetings, we conducted a document review that delineated the changes in policy and practice engendered by the implementation of the SPARC-13.

### **FBOP Practices Prior to the SPARC-13**

To fully understand the implementation of the SPARC-13 and its impact on the FBOP, it was first necessary to determine how the agency assessed needs, developed reentry plans, and matched individuals to programming prior to the implementation of the tool. Before the SPARC-13 made its debut in 2020, the FBOP had a less formally structured process for assessing needs and creating program referrals. For instance, FBOP employs doctoral level psychologists at each FBOP facility, where an assessment is provided and identifies an individual's 'care levels' representing the intensity of mental health services that are needed. Moreover, while the FBOP's Education Departments assess the need for a secondary degree or credential [e.g., high school degree or general education development (GED)], the Health Services Department assesses for physical health needs, including treatment, medication, and services. Finally, for substance use needs, FBOP unit/case managers review PSRs and, according to objective criteria (i.e., indications of current drug-related offenses or those committed while under the influence), place individuals in a drug education course. Following the course, which is focused on education and motivation, confined individuals are then encouraged to participate in substance use treatment and, if they volunteer, are subsequently referred to residential or outpatient treatment. An individual is only identified to 'satisfy' or remove their substance use needs by completing recommended treatment, and drug education alone does not satisfy the requirement under the FSA. The assessment of needs for the above four domains, which are completed by their respective departments, remained unchanged following the introduction of the SPARC-13.

As discussed below in more detail, however, needs for the other nine domains were either not assessed or not fully integrated into reentry plan and program referral decisions prior to the creation of the SPARC-13. Because referrals to FBOP programs that ostensibly addressed needs such as antisocial thinking and peers, trauma and use, and anger and aggression were not informed by results from a needs assessment, it was often the responsibility of individuals confined in the FBOP to identify their own areas of need and request program referrals. Prior research has indicated that when program eligibility is limited to only those that 'opt-in' or volunteer for optional program, program participation and referral is influenced by motivation rather than need (see Kiluk et al., 2015; Logan et al., 2004). As one FBOP staff person we interviewed pointed out, however, the incarcerated individuals most eager to participate in programming are often lower-risk individuals who need programming the least. This same staff person also observed that, following the implementation of the FSA, higher-risk individuals in the FBOP's custody now have an incentive to participate in programming, whereby participation decreases their risk score and increases their opportunity to receive early release time credits.



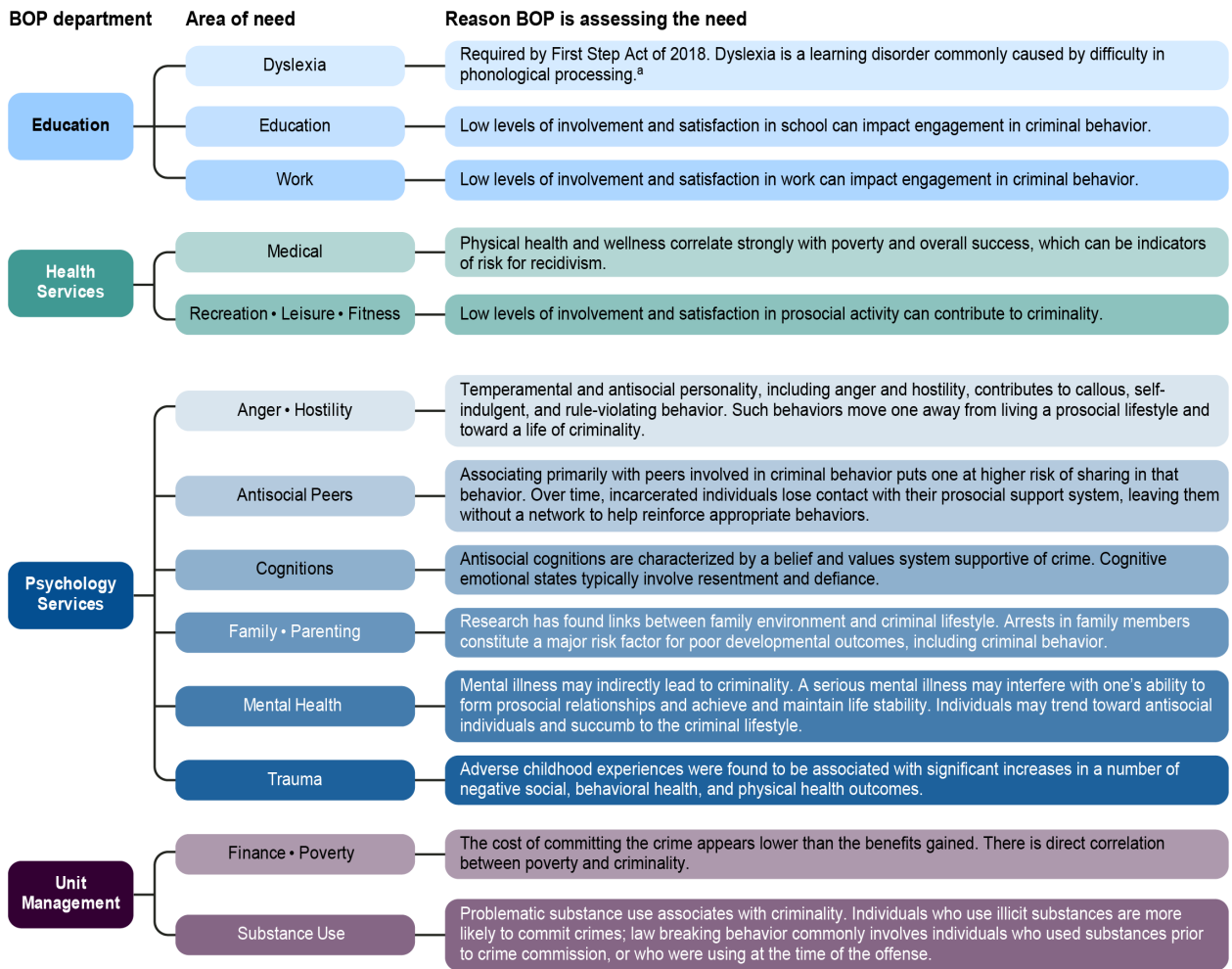
## Development of the SPARC-13

In the months following the enactment of the FSA in December 2018, the FBOP sought to gather information on the types of needs and scales to incorporate into the mandated needs assessment. During the creation of the SPARC-13, the FBOP held a symposium to identify common areas of needs relevant to incarcerated individuals' and reviewed relevant needs assessment literature outlining commonly assessed needs domains. In the late summer of 2019, the FBOP began to assemble the SPARC-13 domains. The SPARC-13 was developed by two senior-level FBOP staff members. During the creation of the SPARC-13, staff identified domains that aligned with the programming currently provided in some capacity. As noted above, changes were not made to the assessment of needs for Education, Physical Health, Mental Health, and Substance Use. For the other domains, however, the FBOP attempted to identify public domain assessments that were appropriate and had been previously validated. To this end, the FBOP selected the adverse childhood experiences (ACEs) scale developed and validated by Felitti et al. (1998) to measure Childhood Trauma. For Antisocial Cognition and Peers, the FBOP selected the MCAA created by Kroner and Mills (2003). The FBOP decided to use the BAAQ developed by Mauro et al. (1987) to measure Anger/Hostility and the McMaster Family Assessment Device (FAD) created by Epstein et al. (1983) to measure Family/Parenting.

For Dyslexia, individuals in the FBOP's custody complete a screening instrument that examines symptoms across functional domains. Individuals who reach the threshold are then administered the Woodcock-Johnson IV, a psychometric test capable of providing a formal diagnosis. To assess Work and Financial domains, the FBOP staff have conducted a review of the PSR, determining prior skill sets, work history, and fines and fees accrued. For the Recreation/Leisure/Fitness domain, the need determination is made by the FBOP's Health Services Division.

For areas that were assessed by the FBOP prior to the SPARC-13 (i.e., Work, Financial, Substance Use, Mental Health, and Recreation/Leisure/Fitness), the thresholds used to determine whether an individual has a need remained the same after implementation. For those domains newly assessed via the SPARC-13, established tools were adopted, where pre-defined scoring thresholds, or cut points, were used by the FBOP to determine 'need'. We note that it is common to adjust RNA cut points to meet the needs of the agency and the population it serves, which may be recommended following an analysis of FBOP assessment and recidivism information. An illustration of FBOP department, areas of need assessed, and reasons for assessment are provided in Figure 1.

**Figure 1. FBOP assessment illustration**



Source: GAO analysis of DOJ documentation. | GAO-23-105139

While the assessment of Dyslexia, Mental Health, Physical Health, and Financial issues may have, in some manner, been previously assessed by the FBOP or adopted as new areas within the SPARC-13, these domains are not identified as criminogenic needs in much of the RNR literature (Bonta & Andrews, 2016). In fact, these areas are often included under the umbrella of ‘responsivity factors’ or ‘destabilizers’ (Taxman & Caudy, 2015) that may interfere with an individual’s ability to participate in, or complete, needs-targeted programming. While these concepts are still important considerations for an individual’s health and well-being, these areas of the SPARC-13 are not generally accepted as ‘criminogenic needs’ due to the absence of a demonstrated, direct association with recidivism. With that said, the rationales for each of the 13 ‘domains’ were outlined by the FBOP and described in the GAO figure provided above.

### Implementation of the SPARC-13

As part of the FSA evaluation requirements, our process evaluation examined if *any subsequent needs assessment system changes were made after the date of enactment of the FSA*. The FBOP is a large agency with staff and facilities spread across the U.S., and it was charged

with implementing the SPARC-13 within a relatively short period of time. Moreover, efforts to implement the SPARC-13 coincided with the onset of the COVID-19 pandemic. As a result, the FBOP encountered several challenges relating to resources, staff workload, training, technology, and communication, which we describe in more detail below.

Implementing the SPARC-13 required FBOP staff to perform work that was, to a large extent, new and unfamiliar. While the FBOP was able to hire some staff to facilitate the implementation of the SPARC-13, the new tasks and responsibilities associated with using the needs assessment system resulted in an increased workload for existing staff. To ease the burden created by the expanded workload, the FBOP implemented several automated procedures and assessment processes impacting the administration of SPARC-13.

First, staff were challenged to ensure that everyone confined in a FBOP facility was assessed at least once on all 13 domains. Yet, some domains require a battery of assessment items to be completed by staff or through self-reporting. The administration of assessments, some new and some existing, expanded the staff's workload. To avoid further increases to staff workload, FBOP decided not to reassess an individual on the full assessment tool collected at intake. Instead, the FBOP's approach to reassessment uses an automated process, where the FBOP SENTRY system determines if an intervention was provided to meet an individual's identified 'need'. To be sure, not all of the domains on the SPARC-13 are suitable for reassessment. For example, given that the ACEs scale (see Felitti et al., 1998) measures trauma occurring in childhood, it only needs to be administered once for an adult population. However, some SPARC-13 assessments, such as the MCAA and the BAAQ, are intended to be administered more than once to assess more granular needs changes.

Therefore, rather than reassessing individuals on the SPARC-13's dynamic domains, the reassessments being performed consist of a review to determine whether programming has been completed to address a needs area and whether behavioral markers indicate progress in this area. For example, if the initial assessment indicates an individual has an Antisocial Cognition need and programming is subsequently completed that is intended to address this need, the reassessment review would indicate the person no longer has this need (as opposed to readministering the MCAA to make that determination). Following the completion of a program, behavioral observations are used by the FBOP to determine if additional programming in a given domain is required. Behaviors such as rule infractions and/or aggressive behavior, substance use, and psychological distress are just a few of the common behavioral observations that may be used to trigger additional programming referrals.

Second, the degree to which FBOP staff and residents have been responsible for completing the SPARC-13 has varied widely. As indicated by the FSA, the FBOP was mandated to assess everyone regardless of when they would be released from prison, and the agency made an effort to complete the assessments as soon as possible. When individuals in prison had access to the computer system, which is typically located in the living units, they self-completed four of the SPARC-13's assessments (i.e., BAAQ, FAD-12, MCAA Part A & Part B). FBOP staff noted that some of the areas covered by the SPARC-13 are sensitive, and the lack of privacy in the living unit when incarcerated individuals are completing the assessment may result in less candid responses. When incarcerated individuals did not have access to computer, FBOP provided

residents with paper copies and later entered the data by hand into the computer system. Staff in some facilities (i.e., restrictive housing) distributed the assessments by walking from cell-to-cell, returning the next day to collect and manually enter the information in a FBOP database.

The assessments for individual domains also differed. Although the BAAQ was not available for use until May 2021, assessments for the Anger/Hostility domain before that time were based on staff making a determination of need. In addition, staff responsible for administering the FAD-12 shifted to the unit management team and then later to staff psychologists. Further, to help reduce the workload for staff, the FBOP used existing information within SENTRY, a decades-old management information system maintained by the agency, for the Mental Health and Substance Use domains.

As noted above, implementing the SPARC-13 required FBOP staff to perform work that was new, time consuming, and largely unfamiliar. Further, FBOP staff reported that case management staff were largely unaware of RNR model prior to the debut of the SPARC-13. The need to initially provide, or update, staff with RNR knowledge is both a common and anticipated training need following the implementation of the new assessment model. While one staff member noted that the provision of training was a positive result of the FSA, their general lack of familiarity with the RNR model (and needs assessments, specifically) in combination with the administration requirements likely influenced the FBOP decision to make use of self-assessments for several domains.

## **Technology**

Many of the assessment processes and data prior to, and following, the SPARC-13's implementation relied on SENTRY. All interviews and focus group participants remarked that SENTRY is a hindrance to innovation and the FBOP's ability to adapt to the challenges associated with the FSA implementation. Notably, software and technology management information systems have been created in recent years to house assessment data, provide program referrals, and track of individuals' needs changes over time. SENTRY was designed to assist staff in monitoring individuals in the FBOP's custody, not as a system to enter and track complex RNA data over time. As such, SENTRY is not ideal for tracking individuals over time, completing reassessments, and providing data with sufficient detail for research and validation purposes. While the FBOP's efforts to make use of existing data systems are commendable, and likely reduced additional workload requirements of the FSA provisions, many SPARC-13 design and process decisions were hindered by the reliance on the SENTRY system.

## **Training**

During the initial implementation, senior-level FBOP staff provided training to facility staff. Because the introduction of the SPARC-13 took place during the emergence of COVID-19, nearly all training was delivered virtually. The training covered a variety of topics, including the RNR model, the risk and needs assessment process, FSA time credits, placement in the community and halfway house time. The training sessions, which lasted anywhere from 15 minutes to 2 hours, were designed to be interactive to allow staff to ask questions. In addition to providing national trainings, sessions were delivered specifically to unit staff, case management

coordinators, and psychologists. At the present time, new FBOP staff are provided training on the FSA and SPARC-13. Further, administrative staff indicated that training of new and existing staff is ongoing.

One common concern expressed by FBOP staff involved the changing, and sometimes conflicting, guidance that staff were given during the implementation of the SPARC-13. One staff person noted, for example, that information on the SPARC-13 policy and practices seemed to change often. Interviews with administrative staff indicated that policy changes are typical with large, mandated adjustments to routine practices like the FSA. Accordingly, staff reported that interpretations of the FSA requirements were provided, and commonly adjusted, and implemented by the FBOP via policy changes following the SPARC-13's implementation. To ensure access to current, accurate information, some units created their own internal webpages to direct incarcerated individuals to relevant information and the policies that were issued providing needed documentation in a centralized location. There were also some units, such as Psychology Services, that offered ongoing guidance to staff through email blasts.

### **The SPARC-13, Reentry Planning and Program Referrals**

Prior to the FSA, relatively few needs were assessed, and the results from this less formally structured process did not consistently influence the development of reentry plans and program referrals. Instead, reentry plans were developed through meetings between individuals in the FBOP's custody and their unit teams (unit manager, case manager, and counselor) in which program referrals were driven by a person's interests as opposed to their assessed needs. As a result of the FSA, people admitted to the FBOP typically receive orientation on the first day, where they are informed they need to complete their SPARC-13 assessments within four weeks. On or around Day 28, people in the FBOP's custody have their first unit team meeting, where they receive their assessment results and develop a reentry plan. The results from the SPARC-13 thus inform the recommendations for program referrals. Following the initial assessment, incarcerated individuals are supposed to meet with unit teams every six months thereafter.

In addition to changes in needs assessment practices, the FBOP has attempted to forge a stronger connection between the programming offered and the domains assessed on the SPARC-13. The Reentry Services Division (RSD), which maintains responsibility for the FSA guide, has matched the FBOP programs available with the 13 needs areas. The FBOP has also added programs. In particular, greater resources for Anger/Hostility programming were provided in response to the FSA.

### **Staff Perceptions of the SPARC-13**

Staff interviews revealed several consistent themes. First, administration indicated that the accelerated pace, workload requirements, and limited FSA resource provisions created challenges that impacted some of the decisions made regarding the design of the SPARC-13. For example, some of the assessments selected appear to have been based on ease of implementation and technological limitations.

Second, some staff commented that while automating some of the automated assessment and referral processes eased potential strains on staff workload, it also removed the human element believed to be important to making valid case management decisions. Specifically, one staff member remarked that the SPARC-13, and its self-assessment processes, is a product of the limitations of the existing SENTRY system. Moreover, SPARC-13 developers indicated that future improvements to the SPARC-13 needs assessment system may be dependent on the funding, time, and resources needed to update, and perhaps even replace, the current SENTRY system.

Third, some staff interviewed were concerned about the self-administered portions of the SPARC-13. Their concerns centered on the need for experienced administrators to ensure accuracy. For instance, staff with knowledge of individuals' prior history and recent behavior are better able to ensure assessment responses are accurate (i.e., recent drug use or violent infractions). These staff stated that even though self-administration of assessment tools is not ideal, they understood the FBOP must balance the costs of self-administration within current resource considerations.

Regarding the current evaluation, some staff were concerned that parts of the SPARC-13 may not be reliable indicators of incarcerated individuals' needs. Specifically, because many of the scales were built with a different population in mind, the results of the tools and their indications of "programming need" may not translate to the FBOP population. While prior research has indicated that tools built for another population and applied off-the-shelf in a new population may not perform with the same level of accuracy (Duwe and Rocque, 2018), the findings from the current evaluation will help determine whether there is a need to adjust the assessments selected for the SPARC-13.

However, because the needs assessment was developed to reflect existing processes and current programming, all staff interviews remarked that the SPARC-13 "could be improved". Given the brief development period, beginning in August of 2019 to full implementation in January of 2020, staff believed there was not sufficient time to create an optimal tool for the FBOP population, develop buy-in, and train staff on current scales and procedures. Further, when asked directly how to improve the tool, some suggested a need for major revisions, while others suggested creating a new assessment that accounts for the variety of FBOP population needs. Further, some staff suggested a need to create quality control for data collection procedures and provide more routine communication and feedback regarding the assessment and its utility within case management procedures.

Despite the challenges involved with implementing the SPARC-13 across the FBOP, staff reported that the FSA and, in particular, its mandated risk and needs assessment process had brought about some benefits. While there was a lot of discretion in the formation of reentry plans and program referrals prior to the FSA, the implementation of the PATTERN and SPARC-13 has given the FBOP a more standardized approach to the assessment process. Moreover, providing training on risk and needs assessment and, more broadly, the RNR model has equipped staff with some knowledge about who should be prioritized for programming and what areas should be targeted to minimize recidivism risk. Finally, FBOP staff have observed an increased

interest in program participation among incarcerated individuals, which is likely a direct byproduct of the FSA's early release incentive.

Still, FBOP staff indicated that training and communication are ongoing challenges involved with the implementation of the SPARC-13. Because the assessment's debut took place during the COVID-19 pandemic, training was, by necessity, delivered virtually. Staff believe future training could be more effective if it could be delivered in person at the FBOP's training center. Ongoing training on the RNR model was cited as another area for improvement, as it was suggested that staff may still struggle to understand how to respond to identified needs.

In addition to training and communication, FBOP administrators cited the impact of funding and resources on the future success of the SPARC-13. Currently, the SPARC-13 is administered through a combination of self-assessment, clinical assessment, staff review of the PSR, and manual data entry. With multiple methods of data collection, the process by which the SPARC-13 is administered undoubtedly varies across the agency, and the lack of a standardized approach may impact the reliability of assessment findings. Annual evaluation findings should identify the magnitude of this impact.

### **Evaluating the Validity of the SPARC-13**

Following the process evaluation, we evaluated the validity of the SPARC-13. As noted earlier, the FSA stipulates an annual review and validation. A specific element of this evaluation is a *statistical validation of the needs assessment system*. Needs assessments often consist of several domain scales thought to represent key (latent) indicators of criminal behavior. To assess latent constructs, our validation of the SPARC-13 focused on several elements of construct validity, namely convergent/divergent, internal structure (i.e., dimensionality, internal reliability, and measurement invariance), and concurrent validity. Before describing these tests, we first describe the evaluation sample.

#### **Sample**

The sample used to evaluate the SPARC-13's construct validity consisted of 142,359 incarcerated individuals who had been assessed by the end of FY 2021. Sample descriptives are provided in Table 2 in which either percentages or means (i.e., "M") are presented. All response frequencies for scale items are provided as percentages. Descriptives are further broken down by gender and race/ethnicity.

**Table 2. Sample Descriptives (N=142,359)**

	Total %/M	Male %/M	Female %/M	White %/M	Black %/M	Hispanic %/M	Native Am. %/M	Asian %/M
<i>Demographics</i>								
Male	92	--	--	--	--	--	--	--
<i>Race/Ethnicity</i>								
White	38	--	--	--	--	--	--	--
Black	40	--	--	--	--	--	--	--
Hispanic	19	--	--	--	--	--	--	--
Asian	1	--	--	--	--	--	--	--
Native American	2	--	--	--	--	--	--	--
<i>ACEs – Trauma Domain</i>								
1: Family: humiliate/make afraid	18	34	47	37	32	33	41	38
2: Family: violent or injure	25	33	39	33	43	33	32	34
3. Family: sex abuse	22	16	46	24	14	15	27	14
4. Family: no support	59	25	37	25	25	26	34	23
5. Family: neglect	31	23	20	17	27	25	27	17
6. Parents divorce	48	59	64	52	67	54	65	39
7. Mother abused	20	30	39	29	33	28	41	21
8. Lived w/ someone substance prob.	30	47	56	48	50	44	66	34
9. Lived w/ someone mental health	20	20	31	24	18	17	33	18
10. Lived w/ someone went prison	30	30	27	18	41	29	36	18
11. Adult trauma	1	1	1	1	1	1	1	1
ACE's Total Score	16(3)	17(3)	16(3)	17(3)	17(3)	17(3)	16(3)	18(3)
ACE Need Indicated	56	55	69	54	59		69	48
<i>BAAQ – Anger Domain</i>								
1. When I really lose my temper, I am capable of hitting or slapping	36	32	31	33	37	37	37	34
2 I get mad enough to hit, throw, or kick things.	28	52	39	34	27	23	33	31
3. I easily lose my patience with people.	38	29	19	43	35	34	41	38
4. If someone doesn't ask right way, I avoid, delay, or not do it .	26	37	33	32	23	24	29	30
5. At times I feel I get a raw deal out of life	21	31	20	26	17	21	25	24



6. When I get mad I say threatening or nasty things.	28	50	39	34	17	23	25	24
BAAQ Total Score	6(4)	6(5)	8(5)	6(5)	7(5)	7(5)	7(4)	6(4)
BAAQ Need Indicated	29	29	38	27	32		35	25
MCAA – Peers								
1. How much of your free time you spend with Person #1?	16	17	13	18	15	16	18	18
2. Has Person #1 ever committed a crime?	26	25	40	29	25	22	37	20
3. Does Person #1 have a criminal record?	28	22	37	25	23	21	33	18
4. Has Person #1 ever been to jail?	8	27	42	29	29	24	46	19
5. Has Person #1 tried to involve you in a crime?	30	8	14	9	8	6	11	6
6. How much of your free time you spend with Person #2?	27	29	21	32	27	25	27	27
7. Has Person #2 ever committed a crime?	30	30	35	30	33	24	39	20
8. Does Person #2 have a criminal record?	10	27	32	26	35	22	30	17
9. Has Person #2 ever been to jail?	44	30	35	29	34	25	44	19
10. Has Person #2 tried to involve you in a crime?	28	10	12	11	11	8	12	8
11. How much of your free time you spend with Person #3?	25	45	35	50	42	39	39	39
12. Has Person #3 ever committed a crime?	27	28	32	29	31	22	35	21
13. Does Person #3 have a criminal record?	10	24	28	24	27	20	31	18
14. Has Person #3 ever been to jail?	35	27	31	26	31	22	38	25
15. Has Person #3 tried to involve you in a crime?	33	10	11	11	12	8	11	8
MCAA Peers Total Score	3(4)	3(4)	4(5)	3(4)	3(4)	3(4)	4(4)	2(4)
MCAA Peers Need Indicated	23	23	30	21	26		34	16
MCAA – Cognitive								
1. It's okay to hit someone who insults you.	9	9	7	6	12	8	13	7
2. Stealing to survive is okay.	12	13	9	15	11	9	15	12
3. I'm not likely to commit a crime in the future.	84	84	85	89	84	76	78	90

4. I have a lot in common with people who break the law.	24	24	23	21	28	19	29	21
5. There's nothing wrong with beating up a snitch.	12	12	9	10	13	12	18	9
6. A person can take what is owed, even if they have to steal.	6	6	5	5	7	5	8	5
7. I would keep any amount of money I found.	33	34	23	25	43	26	35	24
8. None of my friends have committed crimes.	23	23	23	27	17	29	17	37
9. Sometimes you have to fight to keep your self-respect.	37	38	24	31	44	32	43	34
10. I should be allowed to decide what's right and wrong.	51	51	52	38	56	65	59	60
11. I could see myself lying to the police.	32	33	25	31	39	23	32	25
12. I know several people who have committed crimes.	73	73	72	70	80	64	77	63
13. Someone who makes you very angry deserves to be punched.	6	6	6	5	6	8	13	7
14. Only I should decide what I deserve.	25	25	28	16	31	30	33	25
15. In certain situations, I would try to outrun the police.	25	26	14	20	34	18	30	19
16. I wouldn't steal, and I would hold it against anyone who does.	62	63	27	65	60	61	55	63
17. People who get beat up usually had it coming.	18	19	13	16	19	19	30	20
18. I should be treated like anyone else, no matter what I've done.	69	69	73	69	67	73	75	67
19. It's okay to cheat certain people.	6	6	4	5	6	6	10	7
20. I always feel comfortable around criminal friends.	14	14	18	14	14	15	23	13
21. It's all right to fight someone if they stole from you.	23	23	14	20	26	21	28	21
22. Wrong for a money to stop you from getting what you want.	23	23	22	18	28	24	24	21
23. I could easily tell a convincing lie.	24	24	19	23	27	19	26	23

24. Most of my friends don't have criminal records.	61	62	56	65	58	61	46	69
25. It's not wrong to hit someone who puts you down.	10	110	8	8	10	11	16	9
26. A hungry man has the right to steal.	10	10	10	11	9	8	15	11
27. Rules won't stop me from doing what I want.	10	10	7	8	12	10	14	9
28. I have friends who have been to jail.	76	76	75	72	83	69	84	63
29. Snitches get what they have coming.	20	20	15	15	23	20	26	19
30. Taking what is owed you is not really stealing.	15	16	12	11	19	16	20	15
31. I would not enjoy getting away with something wrong.	63	64	64	68	60	60	62	73
32. None of my friends have ever wanted to commit a crime.	32	33	33	31	29	42	34	47
33. It's not wrong to fight to save face.	21	22	13	18	24	21	28	21
34. Only I can decide what is right and wrong.	23	23	29	18	23	33	38	29
35. I would run a scam if I could get away with it.	8	8	6	6	10	6	11	7
36. I have committed a crime with friends.	50	50	51	48	56	41	52	43
37. Someone makes you angry shouldn't complain if punched.	11	12	10	9	12	14	21	14
38. A person should decide what they deserve out of life.	61	61	62	52	72	58	69	61
39. I would commit a crime if I had a good reason.	19	19	15	17	22	16	23	16
40. I have friends who are well known to the police.	38	38	37	38	41	29	47	27
41. Not wrong beating up someone who asks for it.	11	11	7	8	13	12	19	11
42. It's only right to treat me like everyone else.	67	67	72	67	66	71	74	66
43. I won't break the law again.	89	89	91	89	88	88	81	93

44. It's okay to fight someone who cheated you.	10	10	7	9	10	10	17	11
45. A lack of money shouldn't stop getting what you want.	31	32	26	21	41	31	33	30
46. I would enjoy fooling the police.	12	12	7	11	14	8	17	8
MCCA Cognitive Total Score	12(8)	13(8)	12(8)	12(8)	14(8)		15(9)	12(9)
MCAA Cognitive Need Indicated	60	61	56	53	70		72	52
<i>FAD-12 Family</i>								
1. Family activities difficult because we misunderstand each other.	15	15	18	14	15	15	22	19
2. In times of crisis we can turn to each other for support.	33	33	34	34	32	32	38	30
3. We cannot talk to each other about the sadness we feel.	14	13	18	13	12	16	19	13
4. Individuals are accepted for what they are.	49	49	45	50	50	45	53	51
5. We avoid discussing our fears and concerns.	24	24	24	22	25	24	28	22
6. We can express feelings to each other.	44	44	40	46	43	41	47	43
7. There are lots of bad feelings in the family.	19	19	22	18	22	17	25	16
8. We feel accepted for what we are.	52	52	46	53	53	48	56	23
9. Making decisions is a problem for our family.	14	13	18	13	13	15	17	12
10. We are able to make decisions about how we solve problems.	51	51	51	53	51	47	58	50
11. We don't get along well together.	10	10	15	10	10	10	12	8
12. We confide in each other.	47	47	43	49	47	42	53	48
FAD-12 Total Score	2(1)	2(1)	2(1)	2(1)	2(1)		2(1)	2(1)
FAD-12 Need Indicated	43	47	43	42	43		50	41

Among the 13 domains on the SPARC-13, only five represent latent scales with the ability to be evaluated using psychometric standards. Specifically, the Measures of Criminal Attitudes and Associates (MCAA) has two parts, where Part A is scored to assess antisocial associates and consists of a single latent factor. Part B is scored to assess Antisocial Cognition and represents four factors – Violence, Entitlement, Antisocial Intent, and Associates. Each of the four factors combine to form a higher order composite scale – Antisocial Cognitions. For the Family domain, the FBOP uses the McMaster Model of Family Functioning (MMFF), or FAD-12. This scale represents 12 items that are scored to a single dimension. Finally, for the Anger/Hostility domain, the FBOP uses the Brief Anger-Aggression Questionnaire (BAAQ), a brief six-item scale designed to measure a single dimension.

These five domains contain multiple items intended to measure a specific construct. Thus, an assessment of construct validity is appropriate to determine if domains are scaled and correlated with one another. Construct validity consists of five key components: 1) content, 2) convergent/divergent, 3) internal (latent structure), 4) concurrent and 5) predictive validity. Content validity is the degree to which the items are relevant to, and representative of, the defined construct. Moreover, it is typically a measure of agreement between raters, who are considered content experts. Given that the SPARC-13 was developed on the basis of direct input from subject matter experts, the assessment system already has content validity. Due to the aforementioned limitations, the current report will not examine predictive validity. This year's evaluation of the SPARC-13 focuses on 1) convergent/divergent, 2) internal structure, and 3) concurrent validity.

### **Convergent/Divergent Validity**

Convergent and divergent validity examines the relationship among a domain's items to one another and to other domains. More specifically, convergent validity tests whether constructs that are expected to be related are, in fact, related, while divergent validity tests whether constructs that should have no relationship do, in fact, not have any relationship. Designed as a comprehensive needs assessment, the SPARC-13's domains were evaluated for consistency of content within domains and content overlap across domains. Ideally, a domain's items will correlate, or 'hang together', where affirmative responses on one item should elicit a similar response on another within a domain. Further, if a domain efficiently assesses unique content, items should not be correlated with those in other domains. To measure convergent/divergent validity, exploratory factor analysis (EFA) was used to assess the strength of items' loadings and cross-loadings across needs domains.

Based on prior developmental literature, the FAD-12, ACEs, MCAA Part A (Peers), and the BAAQ represent single scales, while the MCAA Part B (Cognitive) represents four sub-scales – Violence (V), Entitlement (E), Antisocial Intent (AI), and Antisocial Associates (AA) – that combine to form a composite scale used to measure criminal thinking needs. In testing convergent validity, EFAs were computed for domains in paired sets, where two factors were specified for pairs of single scales and five factors were specified for pairs combined with the Cognitive scales.

Psychometric industry standards commonly identify factor loadings greater than, or equal to, 0.4 as sufficient, where all items in each scale are anticipated to demonstrate a sufficient loading on a single factor (AERA, APA, & NCME, 2014). Inconsistent findings, or cross-loadings (>.32 loading on two or more factors), reveal which items and domains may need to be modified or demonstrate overlapping domain content. Ideally, the SPARC-13 items will demonstrate convergence and a lack of divergence. Items that demonstrate less-than-ideal convergence/divergence will be identified as a potential area in need of modification. Model fit statistics are also computed where Tucker-Lewis Index (TLI) values above 0.95, and a root mean square error of approximation (RMSEA) values below 0.05 identify ‘close’ fit (Brown & Cudeck, 1993). Further, RMSEA values less than 0.08 indicate ‘reasonable’ fit and values above 0.10 indicate ‘poor’ fit. For most analyses, factor solutions were restricted to two, while domains combined with the Cognitive scales were restricted to five. To facilitate factor identification, we utilized GeominQ (oblique rotation) methods that provide an oblique rotation for item-construct loading.

**Table 3. EFA Test of Convergence/Divergence on Ten Group Combinations**

Domain groupings	Items	Factors	Cross-loadings	Weak loadings	TLI	RMSEA
1. Anger & Family	18	2 factors	0	1	.88	.08
2. Anger & Trauma	17	2 factors	0	1	.88	.07
3. Anger & Peers	21	2 factors	0	15	.52	.17
4. Anger & Cognitive	52	5 factors	1	9	.87	.04
5. Family & Trauma	23	2 factors	0	1	.83	.08
6. Family & Peers	27	2 factors	0	5	.51	.15
7. Family & Cognitive	58	5 factors	2	8	.86	.04
8. Trauma & Peers	26	2 factors	0	18	.51	.15
9. Trauma & Cognitive	57	5 factors	0	12	.86	.04
10. Peers & Cognitive	61	5 factors	0	16	.80	.05

Summary findings from the EFA analyses are provided in Table 3 and more detailed EFA factor loadings are provided in Appendix Tables 1 through 10. A total of 10 domain groupings were computed, where the number of items and factors tested are indicated. For each the number of groupings cross- and weak-loadings were examined, and TLI and RMSEA fit statistics are also provided.

Three cross-loadings were identified among the Cognitive domain, when paired with the Anger and Family domains. Many weak loadings were identified, where all tests indicated at least one and some more than a dozen. For those groupings with a substantial number of weak and/or cross-loadings (e.g., Anger, Peers, Trauma, & Cognitive), it was anticipated this was a result from overlapping content and issues of shared variance. Thus, a greater number of weak and cross-loadings may be due to the construction of the SPARC-13, where domain scales were selected based on their potential content coverage and said scales were developed independently of one another rather than conceptualized to be part of a composite system or scale. When examining model fit, no tests revealed a TLI that exceeded industry standard thresholds of acceptable fit (>0.9). However, seven of ten tests indicated acceptable RMSEA fit (<=0.08).

Overall, the results from the EFA analyses suggest the SPARC-13 does not have convergent and divergent validity. Due to the manner in which the SPARC-13 was developed, this finding was somewhat anticipated. When scales are designed to be part of a unified assessment system, it is more likely that domains will not overlap with one another and that items within a domain will correlate with one another. Because the SPARC-13 uses scales that had been developed externally and independently of one another, it is unsurprising the results showed that it does not have convergent and divergent validity.

### **Internal Structure Validity**

Internal structure validity is used to assess if item content within a given domain is measuring the construct consistently, as intended, and similarly across key subgroups. There are three aspects of internal structure validity—namely, dimensionality, scale reliability, and measurement invariance. A multi-group confirmatory factor analysis (MGCFA) was used to assess each of the 13 constructs. Items within each domain were entered into a MGCFA to assess if a single dimension exists for four of the outlined domains (Trauma, Peers, Anger, & Family) and a four-factor solution, with a higher order factor, is identified for the Cognitive domain. Where appropriate, findings will demonstrate if a given domain is more accurately measured via multiple dimensions, requiring subscale scoring (AERA, APA, & NCME, 2014).

Scale reliability examines the consistency of response scoring within a domain. Individuals with similar scores are identified to possess similar response patterns. Inconsistencies identify measurement error within a domain. Due to the variant measurement types of the SPARC-13 domains, omega coefficients are proposed to assess scale reliability, where values that exceed 0.80 (for single dimensions) and 0.65 (or multi-dimensional scales) are assessed to meet industry standards (Catalán, 2019). Model fit statistics are also computed where the Comparative Fit Index (CFI) and Tucker-Lewis Index (TLI) values above 0.95, and a root mean square error of approximation (RMSEA) values below 0.05 identify ‘close’, and 0.08 as acceptable fit (Brown & Cudeck, 1993). We also note that CFA models may not demonstrate adequate fit as theoretically constructed due to correlations among item residuals. To accommodate these potential fit issues, guided by modification indices, we included correlated residuals for models where inclusion increased CFI/TLI indices substantially ( $\Rightarrow 0.01$ ).

As a final aspect of internal structure validity, measurement invariance was assessed. These assessments identify if the domain similarly measures subjects across *race and ethnicity* and *gender*. Two assessments are completed for measurement invariance. First, domains are progressively tested to meet industry standards of configural, metric, and scalar.

### **Anger Domain: BAAQ**

A single CFA model was computed for the BAAQ, with a correlated residual. Model fit, standardized factor loadings, and residual correlations are provided in Table 4. All BAAQ factor loadings were identified to be sufficient and significant ( $p < .001$ ) and model fit indices demonstrated acceptable fit. Specifically, the CFI and TLI exceeded industry standard levels ( $> 0.95$ ) and the RMSEA indicated good fit (.04).

**Table 4. BAAQ CFA Fit and Reliability**

<b>Item</b>	<b>F1</b>
1. When I really lose my temper, I am capable of hitting or slapping someone.	0.61
2. I get mad enough to hit, throw, or kick things.	0.78
3. I easily lose my patience with people.	0.76
4. If someone doesn't ask me to do something in the right way, I will avoid, delay doing it, or not do it at all.	0.56
5. At times I feel I get a raw deal out of life (at times I feel that life is unfair).	0.58
6. When I get mad I say threatening or nasty things.	0.77
<b>Correlated residuals</b>	<b>Corr.</b>
#1 & 2	0.21
<b>Model Fit</b>	
CFI	0.992
TLI	0.984
RMSEA	0.047
Omega	0.82

All measurement invariance tests (e.g., CFI, TLI, & RMSEA) for the BAAQ passed configural, metric, and scalar thresholds, indicating relatively equivalent measurement across race/ethnicity and gender (see Appendix 10). Further, the Omega value (0.82) exceeded the industry standard (0.80), indicating sufficient internal reliability of the BAAQ for FBOP subjects. Collectively, these findings indicate the BAAQ exceeds industry standards for internal structure validity.

**Cognitive Domain: MCAA**

According to its developers (Mills et al., 2022), the MCAA Cognitions domain was designed to have four factor sub-domains and a higher order composite factor. As shown in Table 5, the results suggest a need to include three correlated residuals. Regarding the model fit indices, the factor structure did not provide consistent findings. Specifically, regarding dimensionality, the CFI (0.82), and TLI (0.81) were all below acceptable fit values. The RMSEA (0.06) was not ideal but still within the ‘reasonable’ range, whereas the Omega (0.78) exceeded the industry standard threshold for higher-order models. Although all item loadings were significant ( $p < .001$ ), invariance tested was not needed given that fit standards were not met for the sample.

**Table 5. MCAA Cognitive CFA Fit and Reliability**

<b>Item</b>	<b>F 1</b>	<b>F 2</b>	<b>F 3</b>	<b>F 4</b>
Violence				
1. It's okay to hit someone who insults you.	0.58			
5. There's nothing wrong with beating up a snitch.	0.62			
9. Sometimes you have to fight to keep your self-respect.	0.56			
13. Someone who makes you very angry deserves to be punched.	0.65			
17. People who get beat up usually had it coming.	0.58			



21. It's all right to fight someone if they stole from you.	0.70			
25. It's not wrong to hit someone who puts you down.	0.52			
29. Snitches get what they have coming.	0.66			
33. It's not wrong to fight to save face.	0.58			
37. Someone who makes you angry shouldn't complain if they get punched.	0.67			
41. There's nothing wrong with beating up someone who asks for it.	0.74			
44. It's okay to fight someone who cheated you.	0.73			
<b>Entitlement</b>				
2. Stealing to survive is okay.		0.54		
6. A person is right to take what is owed them, even if they have to steal it.		0.61		
10. I should be allowed to decide what's right and wrong.		0.40		
14. Only I should decide what I deserve.		0.47		
18. I should be treated like anyone else, no matter what I've done.		0.20		
22. It's wrong for a lack of money to stop you from getting the things you want.		0.43		
26. A hungry man has the right to steal.		0.59		
30. Taking what is owed you is not really stealing.		0.67		
34. Only I can decide what is right and wrong.		0.40		
38. A person should decide what they deserve out of life.		0.40		
42. No matter what I've done, it's only right to treat me like everyone else.		0.23		
45. A lack of money shouldn't stop you from getting what you want.		0.44		
<b>Antisocial Intent</b>				
3. I'm not likely to commit a crime in the future.			0.08	
7. I would keep any amount of money I found.			-0.52	
11. I could see myself lying to the police.			-0.64	
15. In certain situations, I would try to outrun the police.			-0.67	
19. It's okay to cheat certain people.			-0.57	
23. I could easily tell a convincing lie.			-0.52	
27. Rules won't stop me from doing what I want.			-0.61	
31. I would not enjoy getting away with something wrong.			0.08	
35. I would run a scam if I could get away with it.			-0.65	
39. I would commit a crime if I had a good reason.			-0.67	
43. I won't break the law again.			0.08	
46. I would enjoy fooling the police.			-0.67	
<b>Associates</b>				
4. I have a lot in common with people who break the law.				0.51
8. None of my friends have committed crimes.				-0.44
12. I know several people who have committed crimes.				0.70
16. I wouldn't steal, and I would hold it against anyone who does.				0.01
20. I always feel comfortable around criminal friends.				0.41
24. Most of my friends don't have criminal records.				-0.28
28. I have friends who have been to jail.				0.72
32. None of my friends have ever wanted to commit a crime.				-0.28
36. I have committed a crime with friends.				0.68
40. I have friends who are well known to the police.				0.62
<b>Correlated residuals</b>				
#18 & #42	<b>Corr.</b>			
#3 & #43	0.62	<b>Corr.</b>		
			0.42	
#8 & #32				0.49
<b>Cognitive scale loading</b>	0.91		-0.94	0.57

		0.90		
<b>Model Fit</b>				
CFI		0.82		
TLI		0.81		
RMSEA		0.05		
Omega		0.78		

### Peers Domain: MCAA

A single CFA model was computed for the MCAA Peers domain, with three correlated residuals included. Model fit and factor structure findings are provided in Table 6. All MCAA Peer factor loadings were found to be sufficient and significant ( $p < .001$ ). Regarding the model fit indices, the factor structure and reliability findings did not meet industry standards. Specifically, regarding internal structure validity, the CFI (0.66) and TLI (0.59) were all below critical fit values. The RMSEA (0.21) was found to be poor, and the Omega (0.55) was well below the standard threshold for internal reliability.

**Table 6. MCAA Peers CFA Fit and Reliability**

<b>Item</b>	<b>F 1</b>
1. How much of your free time do you spend with Person #1?	0.43
2. Has Person #1 ever committed a crime?	0.43
3. Does Person #1 have a criminal record?	0.44
4. Has Person #1 ever been to jail?	0.39
5. Has Person #1 tried to involve you in a crime?	0.22
6. How much of your free time do you spend with Person #2?	0.92
7. Has Person #2 ever committed a crime?	0.93
8. Does Person #2 have a criminal record?	0.91
9. Has Person #2 ever been to jail?	0.61
10. Has Person #2 tried to involve you in a crime?	0.19
11. How much of your free time do you spend with Person #3?	0.48
12. Has Person #3 ever committed a crime?	0.55
13. Does Person #3 have a criminal record?	0.47
14. Has Person #3 ever been to jail?	0.40
15. Has Person #3 tried to involve you in a crime?	0.43
<b>Correlated residuals</b>	<b>Corr.</b>
#12 & #13	0.58
#11 & #12	0.58
#2 & #3	0.82
<b>Model Fit</b>	
CFI	0.66
TLI	0.59
RMSEA	0.21
Omega	0.55

## Family Domain: FAD-12

A single CFA model was computed for the FAD-12, with one correlated residual included. Model fit and factor structure findings are provided in Table 7. All FAD-12 factor loadings were found to be sufficient and significant ( $p < .001$ ). Regarding the model fit indices, the factor structure and reliability findings did not meet all industry standards. Specifically, regarding internal structure validity, the CFI (0.91) was found to be acceptable, although the TLI (0.89) was below acceptable fit values. The RMSEA (0.09) indicated poor fit, and the Omega (0.06) was well below the standard threshold for internal reliability. Because the results did not meet fit standards for the sample, invariance testing was not needed.

**Table 7. FAD-12 Family CFA Fit and Reliability**

<b>Item</b>	<b>F 1</b>
1. Planning family activities is difficult because we misunderstand each other.	0.64
2. In times of crisis, we can turn to each other for support.	-0.64
3. We cannot talk to each other about the sadness we feel.	0.68
4. Individuals are accepted for what they are.	-0.38
5. We avoid discussing our fears and concerns.	0.68
6. We can express feelings to each other.	-0.72
7. There are lots of bad feelings in the family.	0.72
8. We feel accepted for what we are.	-0.56
9. Making decisions is a problem for our family.	0.73
10. We are able to make decisions about how we solve problems.	-0.70
11. We don't get along well together.	0.75
12. We confide in each other.	-0.71
<b>Correlated residuals</b> #4 & #8	<b>Corr.</b> 0.45
<b>Model Fit</b>	
CFI	0.91
TLI	0.89
RMSEA	0.09
Omega	0.06

## Trauma Domain: ACEs

A single CFA model was computed for the ACEs, with two correlated residuals. Model fit and factor structure findings are provided in Table 8. All ACE factor loadings were found to be sufficient and significant ( $p < .001$ ). Regarding the model fit indices, the factor structure and reliability findings did not meet industry standards. Specifically, regarding internal structure validity, the CFI (0.96), TLI (0.94), were found to have 'good' and 'acceptable' fits, respectively. The RMSEA (0.05) was found to meet industry standards, and the Omega (0.81) also exceeded the standard threshold for internal reliability. Further, all measurement invariance tests (e.g., CFI, TLI, & RMSEA) for the ACEs passed Configural, Metric, and Scalar thresholds, indicating relatively equivalent measurement across race/ethnicity and gender (see Appendix

Table 11). Collectively, these findings indicate the ACEs scale exceeds industry standards for internal structure validity.

**Table 8. ACEs Trauma CFA Fit & Reliability**

<b>Item</b>	<b>F 1</b>
1: Family: humiliate/make afraid	0.66
2: Family: violent or injure	0.69
3. Family: sex abuse	0.44
4. Family: no support	0.63
5. Family: neglect	0.54
6. Parents divorce	0.49
7. Mother abused	0.64
8. Lived w/ someone substance prob	0.60
9. Lived w/ someone mental health	0.55
10. Lived w/ someone went prison	0.42
11. Adult trauma	0.03
<b>Correlated residuals</b>	<b>Corr.</b>
#1 & #2	0.38
#8 & #10	0.19
<b>Model Fit</b>	
CFI	0.96
TLI	0.94
RMSEA	0.05
Omega	0.81

### Unified Needs Model

Finally, while individual domains may not achieve desired levels of dimensionality, reliability, and measurement invariance, a needs assessment system represents a collective set of domains. This construct provides the opportunity for a collective model of all five domains to meet internal structure validity standards. This unified model was computed as a five-factor model, where five correlated residuals were identified for inclusion. Factor loadings, model fit indicates and residual correlations are provided in Table 9. Only the RMSEA indicated an acceptable fit (0.06), while the CFI, TLI, and Omega all failed to exceed critical values. Again, because model results do not demonstrate adequate fit, invariance tests were not completed.

**Table 9. Unified Needs Model CFA Fit & Reliability**

<b>Item</b>	<b>F 1</b>	<b>F2</b>	<b>F3</b>	<b>F4</b>	<b>F5</b>
<b>BAAQ - Anger</b>					
1. When I really lose my temper, I am capable of hitting or slapping someone.	0.61				
2. I get mad enough to hit, throw, or kick things.	0.82				
3. I easily lose my patience with people.	0.74				

4. If someone doesn't ask me to do something in the right way, I will avoid, delay doing it, or not do it at all.	0.45			
5. At times I feel I get a raw deal out of life (at times I feel that life is unfair).	0.53			
6. When I get mad I say threatening or nasty things.	0.72			
<b>MCAA – Peers</b>				
1. How much of your free time do you spend with Person #1?		0.06		
2. Has Person #1 ever committed a crime?		0.40		
3. Does Person #1 have a criminal record?		0.36		
4. Has Person #1 ever been to jail?		0.37		
5. Has Person #1 tried to involve you in a crime?		0.38		
6. How much of your free time do you spend with Person #2?		0.18		
7. Has Person #2 ever committed a crime?		0.95		
8. Does Person #2 have a criminal record?		0.93		
9. Has Person #2 ever been to jail?		0.91		
10. Has Person #2 tried to involve you in a crime?		0.58		
11. How much of your free time do you spend with Person #3?		0.14		
12. Has Person #3 ever committed a crime?		0.46		
13. Does Person #3 have a criminal record?		0.46		
14. Has Person #3 ever been to jail?		0.48		
15. Has Person #3 tried to involve you in a crime?		0.39		
<b>MCAA – Cognitions</b>				
<b>Violence</b>				
1. It's okay to hit someone who insults you.			0.58	
5. There's nothing wrong with beating up a snitch.			0.55	
9. Sometimes you have to fight to keep your self-respect.			0.56	
13. Someone who makes you very angry deserves to be punched.			0.67	
17. People who get beat up usually had it coming.			0.52	
21. It's all right to fight someone if they stole from you.			0.71	
25. It's not wrong to hit someone who puts you down.			0.50	
29. Snitches get what they have coming.			0.59	
33. It's not wrong to fight to save face.			0.58	
37. Someone who makes you angry shouldn't complain if they get punched.			0.66	
41. There's nothing wrong with beating up someone who asks for it.			0.74	
44. It's okay to fight someone who cheated you.			0.78	
<b>Entitlement</b>				
2. Stealing to survive is okay.			0.40	
6. A person is right to take what is owed them, even if they have to steal it.			0.52	
10. I should be allowed to decide what's right and wrong.			0.24	
14. Only I should decide what I deserve.			0.36	
18. I should be treated like anyone else, no matter what I've done.			0.06	
22. It's wrong for a lack of money to stop you from getting the things you want.			0.30	
26. A hungry man has the right to steal.			0.49	
30. Taking what is owed you is not really stealing.			0.60	
34. Only I can decide what is right and wrong.			0.28	
38. A person should decide what they deserve out of life.			0.27	
42. No matter what I've done, it's only right to treat me like everyone else.			0.10	
45. A lack of money shouldn't stop you from getting what you want.			0.39	
<b>Antisocial Intent</b>				
3. I'm not likely to commit a crime in the future.			-0.11	
7. I would keep any amount of money I found.			0.52	
11. I could see myself lying to the police.			0.57	

15. In certain situations, I would try to outrun the police.			0.56		
19. It's okay to cheat certain people.			0.60		
23. I could easily tell a convincing lie.			0.44		
27. Rules won't stop me from doing what I want.			0.58		
31. I would not enjoy getting away with something wrong.			-0.16		
35. I would run a scam if I could get away with it.			0.54		
39. I would commit a crime if I had a good reason.			0.65		
43. I won't break the law again.			-0.22		
46. I would enjoy fooling the police.			0.58		
<b>Associates</b>					
4. I have a lot in common with people who break the law.			0.47		
8. None of my friends have committed crimes.			-0.18		
12. I know several people who have committed crimes.			0.24		
16. I wouldn't steal, and I would hold it against anyone who does.			0.05		
20. I always feel comfortable around criminal friends.			0.43		
24. Most of my friends don't have criminal records.			-0.25		
28. I have friends who have been to jail.			0.25		
32. None of my friends have ever wanted to commit a crime.			-0.12		
36. I have committed a crime with friends.			0.32		
40. I have friends who are well known to the police.			0.25		
<b>FAD-12 Family</b>					
1. Planning family activities is difficult because we misunderstand each other.				0.64	
2. In times of crisis, we can turn to each other for support.				-0.69	
3. We cannot talk to each other about the sadness we feel.				0.75	
4. Individuals are accepted for what they are.				-0.27	
5. We avoid discussing our fears and concerns.				0.64	
6. We can express feelings to each other.				-0.69	
7. There are lots of bad feelings in the family.				0.66	
8. We feel accepted for what we are.				-0.50	
9. Making decisions is a problem for our family.				0.71	
10. We are able to make decisions about how we solve problems.				-0.69	
11. We don't get along well together.				0.75	
12. We confide in each other.				-0.70	
<b>ACEs – Trauma</b>					
1: Family: humiliate/make afraid					0.80
2: Family: violent or injure					0.80
3: Family: sex abuse					0.50
4: Family: no support					0.72
5: Family: neglect					0.62
6: Parents divorce					0.42
7: Mother abused					0.57
8: Lived w/ someone substance prob.					0.53
9: Lived w/ someone mental health					0.46
10: Lived w/ someone went prison					0.38
11: Adult trauma					0.25
<b>Correlated residuals</b>					
Peers #3 & #4	<b>Corr</b>	<b>Corr</b>	<b>Corr</b>	<b>Corr</b>	<b>Corr</b>
Peers #2 & #3		0.83			
Peers #10 & #11		0.82			
Peers #2 & #4		0.80			
Cognitive #8 & #28		0.72			
			-0.59		
<b>Model Fit</b>					
CFI			0.70		

TLI	0.70
RMSEA	0.06
Omega	0.60

Overall, the CFAs were completed for each domain based on psychometric industry standards. Of the five SPARC-13 domains that could be evaluated, inconsistent fit findings were found. Regarding the internal structure validity, the Anger Domain scale (BAAQ) and the Trauma Domain scale (ACEs) exceeded industry standard thresholds, while the FAD-12 family domain and the MCAA scales for Peers and Cognitive domains did not. Further, the unified model did not exceed fit thresholds. The five evaluated scales do not possess sufficient dimensionality or internal reliability necessary to indicate internal structure validity. It is possible, however, that some of the assessed domains are not designed to represent latent scales or may produce better results with a different factor solution or modifications to item content.

### Concurrent Validity

Concurrent validity assesses the agreement between two different, yet similar, outcomes. Theoretically, a domain’s construct is considered more stable if it can predict a similar outcome consistently. Needs domains are designed to be criminogenic, which means they should also predict recidivism. Since 2020, the FBOP has been using the PATTERN to assess recidivism risk for its population. During its initial validation, the PATTERN was found to have a high degree of accuracy in predicting recidivism for individuals released from federal prisons (Hamilton et al., 2021). Upon revalidation, a team of independent researchers reported that it retained the same high level of predictive accuracy for the FBOP population (National Institute of Justice, 2022; 2023). Assessing the degree to which the SPARC-13 is associated with the PATTERN thus provides an indication as to whether the SPARC-13’s domains are measures of criminogenic needs.

To evaluate the SPARC-13’s concurrent validity, we calculated correlation coefficients and the area under the curve (AUC) between the need ratings assigned for the SPARC-13’s domains and the risk levels for the PATTERN. More specifically, for each of the 13 domains on the SPARC-13, individuals who have been assessed receive a rating of “yes” or “no” as to whether they have a need for a given domain. We assigned a value of “1” to domains designated as “yes” and “0” to those with a “no” rating. When individuals are assessed on the PATTERN, they are assigned to one of four possible risk levels. For the concurrent validity analyses, we collapsed the “medium” and “high” levels into one category (value = 1) and the “low” and “minimum” levels into a second category (value = 0).

**Table 10. Concurrent Validity Between SPARC-13 and PATTERN**

Domain	Correlation Coefficient	AUC
Anger	0.239	0.620
Antisocial Peers	0.113	0.550
Antisocial Cognition	0.182	0.591
Dyslexia	0.026	0.505
Education	0.143	0.566

Financial	0.096	0.548
Medical	-0.094	0.454
Mental Health	0.026	0.505
Parenting/Family	0.021	0.509
Recreation	-0.027	0.486
Substance Use	0.240	0.610
Trauma	0.030	0.515
Work	0.190	0.582

Correlation coefficient values range from 0 to 1, with higher values indicating a stronger association between assessed recidivism risk and having a designated need. With values that range from 0 to 1, the AUC statistic is interpreted as the probability that a randomly selected individual with a medium/high risk level on the PATTERN has a “yes” rating on the SPARC-13 compared to a randomly selected person with a minimum/low risk level. Values at either end of the spectrum (0 or 1) reflect perfect prediction, whereas a value of 0.50 indicates the SPARC-13 domain does no better than chance at predicting a medium/high risk level on the PATTERN. The advantage of the AUC over the correlation coefficient is that it is relatively robust across different base rates and selection ratios (Smith, 1996).

Due to the large sample size, nearly all correlation coefficients and AUC values are statistically significant at the .05 level. To assess the substantive importance of the results, we rely on the guidelines provided by Rice and Harris (2005). Effect sizes are considered large if the value is 0.371 or higher for the correlation coefficient and 0.714 or higher for the AUC. Effect sizes are medium if the value ranges from 0.243-0.370 for the correlation coefficient and 0.639-0.713 for the AUC. Effect sizes are small if the value ranges from 0.10-0.242 for the correlation coefficient and 0.556-0.638 for the AUC. Thus, for a domain to have at least a small effect size, the value will need to be at least 0.100 for the correlation coefficient and 0.556 for the AUC.

**Table 11. Concurrent Validity Between SPARC-13 and PATTERN by Gender**

Domain	Gender	Correlation Coefficient	AUC
Anger	Male	0.229	0.616
	Female	0.204	0.608
Antisocial Peers	Male	0.123	0.554
	Female	0.129	0.571
Antisocial Cognition	Male	0.179	0.590
	Female	0.185	0.603
Dyslexia	Male	0.0301	0.506
	Female	0.025	0.506
Education	Male	0.149	0.570
	Female	0.011	0.506
Financial	Male	0.103	0.552
	Female	0.056	0.533
Medical	Male	-0.097	0.452
	Female	0.026	0.515
Mental Health	Male	0.029	0.505



	Female	0.092	0.527
Parenting/Family	Male	0.026	0.511
	Female	0.052	0.527
Recreation	Male	-0.029	0.485
	Female	0.080	0.546
Substance Use	Male	0.244	0.612
	Female	0.145	0.582
Trauma	Male	0.053	0.526
	Female	0.042	0.524
Work	Male	0.192	0.582
	Female	0.121	0.564

The correlation coefficient and AUC values between the 13 domains and the medium/high risk levels on the PATTERN are presented in Table 10. The results show that none of the domains demonstrated medium or large effect sizes. Instead, there were five domains—Anger, Antisocial Cognition, Education, Substance Use, and Work—in which the correlation coefficient and AUC values were both within the small effect size range. Although one domain, Anti-Social Peers, had a correlation coefficient value (0.113) above the 0.100 threshold, its AUC value (0.550) was just below the 0.556 threshold. For the remaining seven domains, both the correlation coefficient and AUC values failed to achieve the small effect size thresholds.

**Table 12. Concurrent Validity Between SPARC-13 and PATTERN by Race/Ethnicity**

<b>Domain</b>	<b>Race/Ethnicity</b>	<b>Correlation Coefficient</b>	<b>AUC</b>
Anger	Hispanic	0.262	0.627
	Black	0.142	0.577
	Native American	0.111	0.555
	White	0.248	0.624
	Asian	0.206	0.604
Antisocial Peers	Hispanic	0.095	0.538
	Black	0.069	0.534
	Native American	0.060	0.529
	White	0.167	0.576
	Asian	0.110	0.545
Antisocial Cognition	Hispanic	0.154	0.575
	Black	0.126	0.569
	Native American	0.145	0.574
	White	0.226	0.612
	Asian	0.187	0.594
Dyslexia	Hispanic	0.022	0.504
	Black	0.030	0.506
	Native American	0.022	0.505
	White	0.017	0.503
	Asian	0.042	0.507
Education	Hispanic	0.110	0.555
	Black	0.154	0.578
	Native American	0.155	0.573

	White	0.139	0.549
	Asian	0.119	0.554
Financial	Hispanic	0.072	0.536
	Black	0.090	0.549
	Native American	0.131	0.567
	White	0.121	0.560
	Asian	0.086	0.544
Medical	Hispanic	-0.054	0.475
	Black	-0.087	0.455
	Native American	-0.107	0.447
	White	-0.104	0.552
	Asian	-0.084	0.458
Mental Health	Hispanic	0.034	0.505
	Black	0.031	0.506
	Native American	0.049	0.512
	White	0.039	0.509
	Asian	0.005	0.501
Parenting/Family	Hispanic	0.011	0.505
	Black	0.040	0.517
	Native American	0.067	0.530
	White	0.048	0.520
	Asian	0.018	0.508
Recreation	Hispanic	-0.008	0.496
	Black	-0.032	0.482
	Native American	-0.023	0.488
	White	-0.022	0.489
	Asian	0.006	0.503
Substance Use	Hispanic	0.196	0.592
	Black	0.179	0.583
	Native American	0.165	0.569
	White	0.302	0.644
	Asian	0.276	0.642
Trauma	Hispanic	0.015	0.507
	Black	0.029	0.515
	Native American	0.000	0.500
	White	0.046	0.523
	Asian	0.056	0.527
Work	Hispanic	0.146	0.558
	Black	0.149	0.564
	Native American	0.194	0.581
	White	0.214	0.601
	Asian	0.163	0.579

As discussed above, eight of the domains on the SPARC-13 involve FBOP staff making a binary (yes or no) determination as to whether an individual has a need or not. For the other five domains, individuals in the FBOP’s custody complete an assessment and, depending on their score, are given either a “yes” or “no” rating based on predetermined cut points. Because these cut points were not empirically based on the FBOP prison population, we analyzed the association between the medium/high risk level on the PATTERN and the full range of scores for these five domains.

**Table 13. Concurrent Validity Between SPARC-13 and PATTERN by Gender and Race/Ethnicity**

<b>Domain</b>	<b>Gender/Race/Ethnicity</b>	<b>AUC</b>
Anger	Total	0.630
	Male	0.639
	Female	0.605
	Hispanic	0.616
	Black	0.628
	Native American	0.574
	White	0.630
	Asian	0.569
Antisocial Peers	Total	0.597
	Male	0.626
	Female	0.632
	Hispanic	0.597
	Black	0.584
	Native American	0.578
	White	0.653
	Asian	0.607
Antisocial Cognition	Total	0.646
	Male	0.687
	Female	0.673
	Hispanic	0.659
	Black	0.638
	Native American	0.638
	White	0.638
	Asian	0.712
Parenting/Family	Total	0.572
	Male	0.576
	Female	0.582
	Hispanic	0.564
	Black	0.568
	Native American	0.540
	White	0.590
	Asian	0.514
Trauma	Total	0.613
	Male	0.627
	Female	0.600
	Hispanic	0.594
	Black	0.593
	Native American	0.593
	White	0.631
	Asian	0.650

The AUC results are presented in Table 13 for the five domains, including gender, race and ethnicity. For all five domains, the AUC values using the full range of scores, as opposed to the yes/no rating, are higher. In fact, the AUC value for Antisocial Cognition (0.685) now falls within the medium effect size range. Moreover, while Antisocial Peers, Parenting/Family and

Trauma did not previously meet the small effect size threshold, their AUC values are now within the small effect size range. Variation by gender, race, and ethnicity was minimal for the most part, although the AUC values for the Parenting/Family domain did not reach the small effect size threshold for incarcerated individuals that identified as Hispanic, Native American, or Asian. Overall, the results imply the binary need cut points for these domains may need to be revised to better reflect the empirical relationship observed for the FBOP population.

### SPARC-13 Needs and Program Assignments

Evaluating the reliability and validity of the SPARC-13 not only meets the FSA requirements, but it also helps reveal whether the instrument is operating as it was designed and meeting industry standards for performance. Likewise, it is important to understand the distribution of SPARC-13 needs among the FBOP population, including by gender, race, and ethnicity. Further, it is critical to examine whether individuals in the FBOP’s custody have received programming that has addressed their needs.

As shown in Table 14, Work (76%) was the most commonly identified need for the FBOP population, followed by Substance Use (70%). The only other domain in which more than half of the FBOP population had an identified need was Recreation (54%). On the other hand, Dyslexia (3%) was the least common need, along with Mental Health (4%).

**Table 14. SPARC-13 Needs by Gender and Race and Ethnicity**

Domain	Gender/Race/Ethnicity	Yes	No	Refused
Anger	Total	49.2	34.3	16.5
	Male	50.4	33.0	16.6
	Female	30.1	56.2	13.7
	Hispanic	37.9	42.1	20.0
	White	44.1	42.1	13.8
	Black	59.3	24.4	16.3
	Native American	63.2	19.3	17.5
	Asian	37.8	45.3	16.9
Antisocial Peers	Total	26.0	33.7	40.3
	Male	25.4	33.7	40.9
	Female	35.5	33.8	30.7
	Hispanic	19.8	31.6	48.7
	White	28.4	39.7	31.9
	Black	27.9	30.7	41.3
	Native American	30.5	24.1	45.5
	Asian	19.3	40.5	40.2
Antisocial Cognition	Total	42.8	22.2	35.0
	Male	43.2	21.3	35.4
	Female	36.3	35.5	28.2
	Hispanic	37.4	19.5	43.0
	White	40.4	31.5	28.2
	Black	48.1	16.9	35.1
	Native American	46.8	14.5	38.7
	Asian	35.6	27.3	37.0
Dyslexia	Total	3.4	90.5	6.1
	Male	3.3	90.8	5.9

	Female	4.7	86.3	9.0
	Hispanic	3.0	89.2	7.8
	White	3.3	91.5	5.2
	Black	3.6	90.8	5.6
	Native American	5.0	87.1	8.0
	Asian	2.4	89.9	7.7
Education	Total	31.2	68.9	0.0
	Male	31.3	68.7	0.0
	Female	29.1	70.9	0.0
	Hispanic	49.5	50.5	0.0
	White	14.3	85.7	0.0
	Black	33.6	66.4	0.0
	Native American	31.3	68.7	0.0
	Asian	24.7	75.3	0.0
Financial	Total	44.5	55.4	0.1
	Male	44.2	55.7	0.1
	Female	48.2	51.8	0.0
	Hispanic	46.9	52.9	0.2
	White	42.0	57.9	0.1
	Black	44.6	55.3	0.1
	Native American	48.3	51.6	0.1
	Asian	42.8	57.1	0.1
Medical	Total	37.4	62.5	0.1
	Male	37.1	62.8	0.1
	Female	42.2	57.7	0.1
	Hispanic	31.1	68.8	0.1
	White	45.4	54.5	0.0
	Black	35.1	64.9	0.0
	Native American	36.7	63.3	0.1
	Asian	35.4	64.5	0.1
Mental Health	Total	3.8	96.2	0.0
	Male	3.6	96.4	0.0
	Female	7.0	92.9	0.0
	Hispanic	2.1	97.9	0.0
	White	5.8	94.1	0.0
	Black	3.1	96.8	0.0
	Native American	6.4	93.5	0.1
	Asian	2.9	97.0	0.1
Parenting/Family	Total	21.1	58.2	20.7
	Male	20.7	58.4	20.8
	Female	27.7	54.5	17.8
	Hispanic	24.9	50.7	24.5
	White	21.6	61.0	17.5
	Black	18.1	61.3	20.7
	Native American	26.0	52.2	21.8
	Asian	23.1	55.7	21.2
Recreation	Total	54.0	45.9	0.1
	Male	53.6	46.2	0.1
	Female	58.8	41.1	0.1
	Hispanic	48.0	51.7	0.3
	White	60.3	39.6	0.1
	Black	52.7	47.2	0.1
	Native American	53.7	45.9	0.3
	Asian	49.3	50.5	0.2
Substance Use	Total	70.4	29.6	0.0
	Male	70.7	29.3	0.0

	Female	65.3	34.7	0.0
	Hispanic	67.7	32.3	0.0
	White	66.3	33.7	0.0
	Black	74.9	25.1	0.0
	Native American	78.8	21.1	0.0
	Asian	61.0	39.0	0.0
Trauma	Total	35.1	39.2	25.7
	Male	33.5	40.1	26.4
	Female	61.0	24.4	14.6
	Hispanic	26.6	47.1	26.4
	White	41.0	37.7	21.3
	Black	35.5	36.0	28.5
	Native American	39.8	31.1	29.1
	Asian	31.8	44.9	23.4
Work	Total	76.3	23.6	0.1
	Male	76.6	23.3	0.1
	Female	71.2	28.7	0.1
	Hispanic	80.1	19.8	0.1
	White	67.6	32.3	0.1
	Black	80.9	19.0	0.1
	Native American	79.3	20.5	0.2
	Asian	67.7	32.2	0.1

There were notable gender differences for some of the needs on the SPARC-13. For example, 61% of incarcerated women had a need for trauma compared to roughly one-third of the men. Although the overall prevalence for a mental health need was low, the rate at which women had this need was nearly double what it was for men. Conversely, about half of the men had a need for Anger compared to 30% of the women. For the most part, racial and ethnic differences were minimal overall. A notable exception was the Anger domain, where the rate at which incarcerated individuals identifying as Black (59%) and Native American (63%) had an identified need that was about 50% greater than it was for individuals identifying as Hispanic (38%), White (44%), and Asian (38%).

**Table 15. SPARC-13 Needs and Program Assignments**

<b>Domain</b>	<b>Program Matched to Need</b>	<b>Unassigned/Program Not Matched to Need</b>
Anger	1.7%	98.3%
Antisocial Peers	4.0%	96.0%
Antisocial Cognition	8.3%	91.7%
Dyslexia	0.2%	99.8%
Education	3.8%	96.2%
Financial	2.7%	97.3%
Medical	7.8%	92.2%
Mental Health	6.5%	93.5%
Parenting/Family	2.8%	97.2%
Recreation	7.9%	92.1%
Substance Use	11.4%	88.6%
Trauma	4.4%	95.6%
Work	7.2%	92.8%

In Table 15, we present data that show whether individuals had been enrolled in programming that addressed a need that had been identified by the SPARC-13. The results indicate that most individuals in the FBOP's custody were not enrolled in programming that targeted assessed needs. For example, 11% of incarcerated individuals with a Substance Use need were involved in programming that addressed this need, which was the highest rate among the 13 domains. This also means, however, that nearly 90% of individuals with this need were not participating in substance use disorder treatment. The results further show that Dyslexia had the lowest rate, with 0.2% of individuals in FBOP's custody involved in programming that addressed this need.

Due to several caveats, these findings are preliminary and should be interpreted with caution. First, because our sample consisted of individuals who had been assessed in FY 2021, some were recently admitted to prison while others had been confined for longer periods of time. Second, given that many programs are not offered until an incarcerated individual is near the completion of their sentence, our sample contained people who may not have had an opportunity to participate in the entire range of FBOP programming because they were not close enough to release. To more clearly determine the relationship between assessed needs and program assignments, future reports will include analyses that focus on a cohort of individuals who have been released from FBOP custody. In doing so, these analyses will be able to capture the full extent to which individuals were involved in programming that addressed their needs prior to release.

## Discussion

As mandated by Section 3631 of Title 1 of FSA, the current report provides an initial evaluation of the reliability and validity of the FBOP's needs assessment system. Moreover, it describes *subsequent needs assessment changes made after the date of the enactment of the FSA*. Findings from the process evaluation revealed that, prior to the enactment of the FSA and the debut of the SPARC-13, the FBOP assessed fewer criminogenic needs and many program referral decisions were based on motivated individuals volunteering to participate. To create a more comprehensive needs assessment system, the FBOP drew upon new and existing assessments that are administered by staff or self-reported by individuals in FBOP's custody. In early 2020, a little more than a year following the enactment of the FSA, the FBOP began using the PATTERN and the SPARC-13. While the development and implementation of risk and needs assessment instruments was accelerated by the FSA mandates and represents a notable achievement in its own right, it is also worth emphasizing that initial use of the tools coincided with the inception of a pandemic.

The implementation of the SPARC-13 resulted in substantive changes in FBOP policy and practice, including an increased workload for existing staff and a strain on technology systems. It also required FBOP staff to acquire knowledge about the instrument and the RNR model, which led to the development and delivery of training. Despite the significant challenges involved with administering a new assessment process, the implementation of FSA and a risk and needs assessment system was perceived as a net positive by staff and administration. The development of the PATTERN and the SPARC-13 has standardized the FBOP's assessment process, and staff have gained long overdue knowledge about the RNR model. Moreover, staff

indicated that individuals incarcerated in the FBOP have expressed greater interest in participating in programming, and referral decisions are now informed by needs assessments results.

Nevertheless, FBOP staff recognize the SPARC-13 is not a finished product. Although the PATTERN and SPARC-13 currently operate independently of each other, staff observed that each tool was distinct and required the development of training and communication processes to describe the changing policies and interpretation of the FSA mandates. Further, the availability of resources, training, and clear communication during a time of evolving agency policies and practices was a concern.

Due to the design of the SPARC-13, only five of the domains possessed scales that could be fully evaluated for construct validity. Because these scales were adopted ‘off-the-shelf’ from existing instruments, there was a reduced expectation of this element of construct validity. Tests of convergent/divergent validity did not meet psychometric standards. The internal structure validity results revealed the Anger Domain scale (BAAQ) and the Trauma Domain scale (ACEs) exceeded industry standard thresholds, but the Family Domain scale (FAD-12) and the MCAA scales for Peers and Cognitive domains did not.

An additional mandate of the FSA specified that *the SPARC-13 needs assessment system receive statistical validation*. While findings were limited due to the lack of recidivism data and other specific data elements, several findings were provided in this Year 1 report. Specifically, the results from the concurrent validity analyses provide mixed support for the domains on the SPARC-13. Small effect sizes were found for the Anger, Antisocial Cognition, Education, Substance Use, and Work domains, while the remaining eight domains did not meet the small effect size threshold for both concurrent validity metrics.

Further, the FSA mandated to evaluation of recidivism rates among those assessed on the *SPARC-13 to identify any unwarranted disparities, including disparities among similarly classified incarcerated individuals of different demographic groups*. While we were unable to analyze recidivism data for this year’s report, our findings evaluated the SPARC-13 scales by race/ethnicity and gender. There was relatively little overall variation by gender, race, and ethnicity, although a notable difference was observed between men and women for the Education domain. That is, a “Yes” rating for the Education domain was associated with a higher risk level on the PATTERN for men but not for women.

Our results also suggest the “yes/no” need rating cut point may need to be adjusted for five domains. Antisocial Peers, Parenting/Family, and Trauma did not have a small association with recidivism risk when analyzing these domains with the binary rating. Yet, when we analyzed their association with the PATTERN with the full range of scores, all three domains achieved small effect sizes. Moreover, the AUC values increased for the Anger and Antisocial Cognition domains, with the latter having a medium effect size.

We posit there are several reasons why the remaining five domains were not correlated with recidivism risk. First, at least two of the domains—Physical Health and Dyslexia—have never been cited within academic literature as criminogenic needs and the latter was a FSA



mandated domain addition. To be sure, physical health concerns or dyslexia may influence whether individuals are able to successfully complete programming. Neither of these, however, has been shown to have a direct impact on recidivism. Accordingly, as discussed below, these two domains should likely be reconceptualized as specific responsivity factors.

Second, while mental illness is a minor risk factor for recidivism, it has only a modest, indirect impact on reoffending (Andrews et al., 2006). According to Andrews and colleagues (2006), whatever effect mental illness has on recidivism likely reflects the impact of substance use (one of the ‘central eight’ risk factors) along with criminal thinking and antisocial personality pattern (two of the “Big Four”). More recently, scholars have identified mental health as a specific responsivity factor (McCormick et al., 2017; Pinals et al., 2021). In particular, McCormick and colleagues (2017) suggest that mental health is a responsivity factor that may moderate the success of interventions targeted to criminogenic needs.

Finally, as noted earlier, leisure/recreation has been identified within the academic literature as a moderate criminogenic need (Andrews et al., 2006). It is possible the SPARC-13’s measures for this domain do not adequately capture its relationship with recidivism. Or, alternatively, it is also possible that this domain is not a criminogenic need for the FBOP population.

Analyses of the SPARC-13 data revealed that Work is the most identified need for the FBOP population, followed by Substance Use. Dyslexia (3%) is the least common need, along with Mental Health (4%). Compared to men, women were much more likely to have needs for Trauma and Mental Health. Men, on the other hand, were more likely to have a need for the Anger domain. Racial differences were minimal overall, although incarcerated individuals identifying as Black and Native American were about 50% more likely to have a need for the Anger domain than individuals identifying as White and Asian.

The FSA requires the evaluation of the SPARC-13 *to be able to assess each individual’s progress and of regression using dynamic indicators and that can reasonably be expected to change while in prison*. As noted previously, the FBOP does not currently provide a reassessment of needs scales and instead indicates a ‘Yes’ response if a program has not yet been completed to meet an indicated domain need. Once a program is completed, the ‘No’ response is entered, indicating that the need has been addressed. While not ideal, this process provides a mechanism to determine whether an effort has been made to target an individual’s needs during their time in prison. We further provided evidence of the extent to which those in FBOP custody have received programming.

Most individuals in the FBOP’s custody were not enrolled in programming that targeted their assessed needs. Although 11% of incarcerated individuals with a Substance Use need were involved in programming that addressed this need, which was the highest rate among the 13 domains, the remaining 89% of the individuals with this need were not participating in substance use disorder treatment. The results also show that Dyslexia had the lowest rate, with 0.2% of incarcerated individuals involved in programming that addressed this need. At 2%, Anger had the second-lowest rate, which reflects the fact that, prior to FSA, the FBOP had very little

programming that targeted this need. Due to the caveats noted above, however, these results should be considered provisional until more detailed analyses can be performed.

## **Recommendations**

As part of the statutorily mandated requirements, *recommendations proposed for the SPARC-13* are to be provided annually. First, to enhance the use and performance of the SPARC-13, there are critical structural considerations that may require improvement. According to FBOP staff and administration, the resources provided to support the development of the SPARC-13 are likely inadequate. The development and application of a needs assessment is a large endeavor for any agency, let alone one that encompasses a wide geographic region and well over 100 facilities. When adopting a new tool, some agencies may use a dedicated assessment team that administers assessments at intake and provides reassessments at routine intervals. It is also common for an agency to adopt a software platform that allows for the timely scoring, standardized operations, and centralized tracking of case management and program records of all assessed individuals. Further, a quality assurance team is sometimes employed to ensure that assessments are completed accurately, information is clearly communicated, and policies and practices are completed similarly in all facility locations.

Given the accelerated timeline, minimal staffing resources, technology integration limitations, and a lack of a specific funding stream to support these substantial modifications to intake and referral practices, the FBOP's implementation of the SPARC-13 within a relatively short period of time is a notable accomplishment. Further, the need to train staff on the RNR model, the implementation and use of risk and needs assessments on a daily basis, and the impact on earned release time credits were collateral requirements that may not have been fully anticipated by the FSA. Thus, to ensure the FSA and, more specifically, the SPARC-13 are implemented as intended, substantial upgrades in both staffing and technology resources may be needed. Beyond the specified goals of the FSA, upgrades such as these would likely provide positive and long-lasting changes to FBOP staff and the federal prison population.

Second, due to the absence of rearrest data, we were unable to evaluate the SPARC-13's predictive validity. Given PATTERN's ability to accurately predict recidivism for the FBOP population, we anticipate predictive validity findings with the rearrest data will be similar to the concurrent validity results reported here. Once we can assess the predictive validity of scales in their current form, we anticipate adjustments to the need domain cut points will be necessary for some domains. Moreover, it may be necessary to reduce the SPARC-13 to a more strategic set of criminogenic domains that are influenced by evidence-based programming. Indeed, the results thus far suggest eight of the domains are criminogenic needs for the FBOP population, while the other five are not anticipated to be associated with recidivism. We suggest these five domains may be more appropriately characterized as specific responsivity factors. Despite the lack of a direct impact on recidivism, it is still important to assess responsivity factors, as they may interfere with the ability to complete programming and will also be critical in the development of reentry plans.

Without evidence of the SPARC-13's predictive validity, it would be premature to make specific recommendations on how to improve its performance. Regardless of what the predictive

validity results eventually indicate, however, the findings from the current report identify areas in which modifications should be made to the evaluation, practices, and use of the needs assessment system, consistent with Title I-A, B and D of FSA. First, additional data will be needed to not only fully evaluate the SPARC-13, but also to meet the requirements for FSA. Title I-C, for example, specifies that predictive performance of the *dynamic aspects of the tool* will be assessed to determine if dynamic changes impact the likelihood of recidivism following release to the community. As noted above, rearrest data will be needed to evaluate the SPARC-13's predictive validity. In addition, data on PATTERN scores and item values, which were unavailable for the current report, will be needed to recommend improvements, such as a unified risk and needs assessment system that we discuss in more detail below.

Third, we recommend the SPARC-13 should transition from a binary, yes/no needs rating scheme to an ordinal framework that consists of at least three categories (e.g., high, medium, and low). Currently, after completing assessments for all 13 domains on the SPARC-13, an individual may have a need within, say, seven of these domains. With a binary rating system, however, it is unclear which of the seven domains should be prioritized for programming. On the other hand, an ordinal rating system would provide both staff and individuals in the FBOP's custody with greater clarity on which needs should be addressed. Ordinal ratings of need (e.g., high, moderate, and low) are commonly used by contemporary tools to not only prioritize programming for limited slots, but also to assign individuals to the appropriate treatment duration or intensity (e.g., education, outpatient, or residential). Moreover, the results from the concurrent validity analyses provide empirical support for using more categories to identify needs.

Fourth, in future evaluations of the SPARC-13, it will be important to examine inter-rater reliability (IRR) for the domains assessed by FBOP staff. IRR refers to the level of consistency between different raters conducting a risk assessment instrument. The extent to which an assessment is administered (in)consistently across raters should be carefully examined because it can compromise the instrument's performance. Among the 13 domains, there are eight in which FBOP staff make a determination as to whether a confined individual has a need or not. Of the eight, however, there are five—Education, Financial, Leisure, Substance Use, and Work—that would be amenable to an IRR assessment. Conducting an IRR assessment for these five domains may thus be helpful in improving SPARC-13's performance.

Fifth, in addition to conducting an IRR assessment, it may be worth adopting validated, off-the-shelf assessments for some, or all, of these five domains. Standardized assessments are available for Substance Use, and the FBOP has administered the Test for Adult Basic Education (TABE) for its population. While it is unclear how the results from the TABE influence need ratings for Education, greater reliance on this standardized assessment may help address the gender disparity from the concurrent validity results that was observed for the Education domain.

Sixth, reassessments of key domains should be completed to indicate which criminogenic needs are decreasing and their impact on both calculated risk and infraction behavior. These efforts will provide key indicators of progress as individuals engage with programming and services. Rather than conducting a review to determine whether individuals have completed needs-targeted programming, the FBOP should be reassessing incarcerated individuals on the

SPARC-13's dynamic domains to better determine whether needs are being successfully addressed and recidivism risk is being reduced.

Seventh, adding reassessments to the current processes will likely require additional resources, as routine administration of the SPARC-13 scales is labor-intensive but necessary. As noted above, current staffing levels may be lacking for optimal implementation of the FBOP's needs assessment system and reassessments will only further reduce limited bandwidth. Thus, in order for the SPARC-13 to achieve its full potential, additional resources may be needed.

Eighth, evaluation findings suggest that more programming resources may be needed to adequately meet the needs of the FBOP population. This issue will be examined more fully in subsequent reports by focusing on a cohort of individuals released from FBOP custody. In addition, it may be necessary to adjust the current scales and provide measures that are more in line with the FBOP population and programming. After all, some of the assessments within the SPARC-13 were created on differing development samples and adopted off-the-shelf.

Ninth, despite the promise of the RNR model, not all correctional agencies have adopted the methods of assessment and referral at the same pace or vigor. As our brief process evaluation revealed, there are many central aspects of the RNR model and correctional rehabilitation theory that were only recently implemented in response to the FSA. A key finding from the process evaluation is that the RNR model was not well-known by FBOP staff and programming referrals were commonly provided to those with a desire to participate in programming. One of the positives of the FSA was the ability to both assess needs and motivate program participation through the inclusion of dynamic items in the calculation of early release time credits. While the FSA forced a needed "infusion" of the RNR model into general options, similar to a medication treatment plan, the FBOP should not stop with a single dose. Continued efforts to train and facilitate case manager usage of the RNR principles and skills is needed in the near term and should be routinely refreshed and evaluated.

Finally, to improve FBOP practice and, presumably, the outcomes for individuals confined in its facilities, the SPARC-13 and PATTERN should operate in tandem. The two instruments not only operate independently of each other, but the SPARC-13, in particular, functions as 13 separate units. The development of the SPARC-13 provided an initial step towards assessing needs more comprehensively for the FBOP population, but further refinement is needed.

Existing research on the PATTERN has shown it has high predictive accuracy for the FBOP population, while the results presented in this report suggest that many, but perhaps not all, of the SPARC-13 items and domains will have value going forward. In short, the FBOP currently has the foundation for a unified risk and needs assessment system that meets its needs and provides a model that is consistent with RNA theory and the FSA's intent. Following further refinement, testing and validation of the SPARC-13 and PATTERN, it will be beneficial to eventually combine the elements of the SPARC-13 and the PATTERN to form a cooperative risk and needs assessment system.

Through the development of a comprehensive and strategically designed needs tool, subject matter expertise can be garnered to build an assessment tailored for the unique aspects of FBOP supervision and case management. This construction will also reduce the use of redundant, or overlapping, content observed across the domain scales. Although the development of a more tailored tool will require additional effort and resources, we believe it would be advantageous for the FBOP to recognize the need now and begin conceptualizing development efforts.

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**Appendix Table 1. EFA Model on Peers & Cognitive**

Item	F1	F2	F3	F4	F5
1. How much of your free time you spend with Person #1?					
2. Has Person #1 ever committed a crime?					0.91
3. Does Person #1 have a criminal record?					0.96
4. Has Person #1 ever been to jail?					0.86
5. Has Person #1 tried to involve you in a crime?					0.47
6. How much of your free time you spend with Person #2?					
7. Has Person #2 ever committed a crime?			0.91		
8. Does Person #2 have a criminal record?			0.97		
9. Has Person #2 ever been to jail?			0.91		
10. Has Person #2 tried to involve you in a crime?			0.50		
11. How much of your free time you spend with Person #3?					
12. Has Person #3 ever committed a crime?		0.91			
13. Does Person #3 have a criminal record?		0.96			
14. Has Person #3 ever been to jail?		0.92			
15. Has Person #3 tried to involve you in a crime?		0.58			
1. It's okay to hit someone who insults you.	0.55				
2. Stealing to survive is okay.	0.47				
3. I'm not likely to commit a crime in the future.					
4. I have a lot in common with people who break the law.					
5. There's nothing wrong with beating up a snitch.	0.61				
6. A person can take what is owed, even if they have to steal.	0.58				
7. I would keep any amount of money I found.	0.45				
8. None of my friends have committed crimes.					-0.68
9. Sometimes you have to fight to keep your self-respect.	0.51				
10. I should be allowed to decide what's right and wrong.					
11. I could see myself lying to the police.	0.49				
12. I know several people who have committed crimes.					0.48
13. Someone who makes you very angry deserves to be punched.	0.65				
14. Only I should decide what I deserve.	0.43				
15. In certain situations, I would try to outrun the police.	0.54				
16. I wouldn't steal, and I would hold it against anyone who does.					
17. People who get beat up usually had it coming.	0.56				
18. I should be treated like anyone else, no matter what I've done.					
19. It's okay to cheat certain people.	0.58				
20. I always feel comfortable around criminal friends.	0.44				
21. It's all right to fight someone if they stole from you.	0.66				
22. Wrong for a money to stop you from getting what you want.					
23. I could easily tell a convincing lie.	0.42				
24. Most of my friends don't have criminal records.					-0.41
25. It's not wrong to hit someone who puts you down.	0.52				
26. A hungry man has the right to steal.	0.55				
27. Rules won't stop me from doing what I want.	0.59				
28. I have friends who have been to jail.					0.53
29. Snitches get what they have coming.	0.64				
30. Taking what is owed you is not really stealing.	0.64				
31. I would not enjoy getting away with something wrong.					
32. None of my friends have ever wanted to commit a crime.					-0.58
33. It's not wrong to fight to save face.	0.57				
34. Only I can decide what is right and wrong.					
35. I would run a scam if I could get away with it.	0.59				
36. I have committed a crime with friends.					0.46



37. Someone makes you angry shouldn't complain if punched.	0.66			
38. A person should decide what they deserve out of life.				
39. I would commit a crime if I had a good reason.	0.59			
40. I have friends who are well known to the police.				
41. Not wrong beating up someone who asks for it.	0.73			
42. It's only right to treat me like everyone else.				
43. I won't break the law again.				
44. It's okay to fight someone who cheated you.	0.72			
45. A lack of money shouldn't stop getting what you want.				
46. I would enjoy fooling the police.	0.61			

**Appendix Table 2. EFA Model on Peers & Anger**

<b>Item</b>	<b>F1</b>	<b>F2</b>
1. How much of your free time you spend with Person #1?		
2. Has Person #1 ever committed a crime?		
3. Does Person #1 have a criminal record?		
4. Has Person #1 ever been to jail?		
5. Has Person #1 tried to involve you in a crime?		
6. How much of your free time you spend with Person #2?		
7. Has Person #2 ever committed a crime?	0.93	
8. Does Person #2 have a criminal record?	0.95	
9. Has Person #2 ever been to jail?	0.91	
10. Has Person #2 tried to involve you in a crime?	0.54	
11. How much of your free time you spend with Person #3?		
12. Has Person #3 ever committed a crime?		0.92
13. Does Person #3 have a criminal record?		0.96
14. Has Person #3 ever been to jail?		0.92
15. Has Person #3 tried to involve you in a crime?		0.60
1. When I really lose my temper, I am capable of hitting or slapping someone.		
2. I get mad enough to hit, throw, or kick things.		
3. I easily lose my patience with people.		
4. If someone doesn't ask me to do something in the right way, I will avoid, delay doing it, or not do it at all.		
5. At times I feel I get a raw deal out of life (at times I feel that life is unfair).		
6. When I get mad I say threatening or nasty things.		

**Appendix Table 3. EFA Model on Peers & Trauma**

<b>Item</b>	<b>F1</b>	<b>F2</b>
1. How much of your free time you spend with Person #1?		
2. Has Person #1 ever committed a crime?		
3. Does Person #1 have a criminal record?		
4. Has Person #1 ever been to jail?		
5. Has Person #1 tried to involve you in a crime?		
6. How much of your free time you spend with Person #2?		
7. Has Person #2 ever committed a crime?	0.93	
8. Does Person #2 have a criminal record?	0.95	
9. Has Person #2 ever been to jail?	0.91	
10. Has Person #2 tried to involve you in a crime?	0.54	
11. How much of your free time you spend with Person #3?		
12. Has Person #3 ever committed a crime?		0.92
13. Does Person #3 have a criminal record?		0.96
14. Has Person #3 ever been to jail?		0.92
15. Has Person #3 tried to involve you in a crime?		0.60
1. Family: humiliate/make afraid		
2. Family: violent or injure		
3. Family: sex abuse		
4. Family: no support		
5. Family: neglect		
6. Parents divorce		
7. Mother abused		
8. Lived w/ someone substance prob.		
9. Lived w/ someone mental health		
10. Lived w/ someone went prison		
11. Adult trauma		

**Appendix Table 4. EFA Model on Peers & Family**

<b>Item</b>	<b>F1</b>	<b>F2</b>
1. How much of your free time you spend with Person #1?		
2. Has Person #1 ever committed a crime?		0.42
3. Does Person #1 have a criminal record?		0.42
4. Has Person #1 ever been to jail?		0.43
5. Has Person #1 tried to involve you in a crime?		
6. How much of your free time you spend with Person #2?		
7. Has Person #2 ever committed a crime?		0.93
8. Does Person #2 have a criminal record?		0.94
9. Has Person #2 ever been to jail?		0.91
10. Has Person #2 tried to involve you in a crime?		0.60
11. How much of your free time you spend with Person #3?		
12. Has Person #3 ever committed a crime?		0.49
13. Does Person #3 have a criminal record?		0.48
14. Has Person #3 ever been to jail?		0.48
15. Has Person #3 tried to involve you in a crime?		
1. Planning family activities is difficult because we misunderstand each other.	0.63	
2. In times of crisis, we can turn to each other for support.	-0.64	
3. We cannot talk to each other about the sadness we feel.	0.68	
4. Individuals are accepted for what they are.	-0.40	
5. We avoid discussing our fears and concerns.	0.68	
6. We can express feelings to each other.	-0.72	
7. There are lots of bad feelings in the family.	0.70	
8. We feel accepted for what we are.	-0.57	
9. Making decisions is a problem for our family.	0.73	
10. We are able to make decisions about how we solve problems.	-0.70	
11. We don't get along well together.	0.75	
12. We confide in each other.	-0.71	

**Appendix Table 5. EFA Model on Anger & Trauma**

<b>Item</b>	<b>F1</b>	<b>F2</b>
1. When I really lose my temper, I am capable of hitting or slapping.		0.67
2. I get mad enough to hit, throw, or kick things.		0.79
3. I easily lose my patience with people.		0.73
4. If someone doesn't ask right way, I avoid, delay, or not do it.		0.58
5. At times I feel I get a raw deal out of life		0.55
6. When I get mad I say threatening or nasty things.		0.77
1: Family: humiliate/make afraid	0.75	
2: Family: violent or injure	0.77	
3. Family: sex abuse	0.40	
4. Family: no support	0.62	
5. Family: neglect	0.52	
6. Parents divorce	0.48	
7. Mother abused	0.60	
8. Lived w/ someone substance prob.	0.57	
9. Lived w/ someone mental health	0.51	
10. Lived w/ someone went prison	0.40	
11. Adult trauma		

**Appendix Table 6. EFA Model on Family & Trauma**

<b>Item</b>	<b>F1</b>	<b>F2</b>
1. Family activities difficult because we misunderstand each other.		0.63
2. In times of crisis we can turn to each other for support.		-0.65
3. We cannot talk to each other about the sadness we feel.		0.67
4. Individuals are accepted for what they are.		-0.41
5. We avoid discussing our fears and concerns.		0.68
6. We can express feelings to each other.		-0.72
7. There are lots of bad feelings in the family.		0.69
8. We feel accepted for what we are.		-0.58
9. Making decisions is a problem for our family.		0.75
10. We are able to make decisions about how we solve problems.		-0.70
11. We don't get along well together.		0.74
12. We confide in each other.		-0.72
1. Family: humiliate/make afraid	0.71	
2. Family: violent or injure	0.76	
3. Family: sex abuse	0.40	
4. Family: no support	0.60	
5. Family: neglect	0.51	
6. Parents divorce	0.48	
7. Mother abused	0.63	
8. Lived w/ someone substance prob.	0.60	
9. Lived w/ someone mental health	0.54	
10. Lived w/ someone went prison	0.43	
11. Adult trauma		

**Appendix Table 7. EFA Model on Family & Anger**

<b>Item</b>	<b>F1</b>	<b>F2</b>
1. Family activities difficult because we misunderstand each other.		0.62
2. In times of crisis we can turn to each other for support.		-0.63
3. We cannot talk to each other about the sadness we feel.		0.71
4. Individuals are accepted for what they are.		
5. We avoid discussing our fears and concerns.		0.69
6. We can express feelings to each other.		-0.69
7. There are lots of bad feelings in the family.		0.68
8. We feel accepted for what we are.		-0.56
9. Making decisions is a problem for our family.		0.75
10. We are able to make decisions about how we solve problems.		-0.66
11. We don't get along well together.		0.77
12. We confide in each other.		-0.70
1. When I really lose my temper, I am capable of hitting or slapping someone.	0.65	
2. I get mad enough to hit, throw, or kick things.	0.82	
3. I easily lose my patience with people.	0.74	
4. If someone doesn't ask me to do something in the right way, I will avoid, delay doing it, or not do it at all.	0.54	
5. At times I feel I get a raw deal out of life (at times I feel that life is unfair).	0.49	
6. When I get mad I say threatening or nasty things.	0.76	

**Appendix Table 8. EFA Model on Trauma & Cognitive**

Item	F1	F2	F3	F4	F5
1. Family: humiliate/make afraid		0.78			
2. Family: violent or injure		0.79			
3. Family: sex abuse		0.44			
4. Family: no support		0.63			
5. Family: neglect		0.49			
6. Parents divorce					
7. Mother abused		0.58			
8. Lived w/ someone substance prob.		0.51			
9. Lived w/ someone mental health		0.50			
10. Lived w/ someone went prison					
11. Adult trauma					
1. It's okay to hit someone who insults you.	0.57				
2. Stealing to survive is okay.	0.51				
3. I'm not likely to commit a crime in the future.					0.53
4. I have a lot in common with people who break the law.					
5. There's nothing wrong with beating up a snitch.	0.65				
6. A person can take what is owed, even if they have to steal.	0.61				
7. I would keep any amount of money I found.					
8. None of my friends have committed crimes.			-0.62		
9. Sometimes you have to fight to keep your self-respect.	0.43				
10. I should be allowed to decide what's right and wrong.				0.60	
11. I could see myself lying to the police.	0.48				
12. I know several people who have committed crimes.			0.67		
13. Someone who makes you very angry deserves to be punched.	0.66				
14. Only I should decide what I deserve.				0.57	
15. In certain situations, I would try to outrun the police.	0.52				
16. I wouldn't steal, and I would hold it against anyone who does.					
17. People who get beat up usually had it coming.	0.49				
18. I should be treated like anyone else, no matter what I've done.					
19. It's okay to cheat certain people.	0.59				
20. I always feel comfortable around criminal friends.	0.41				
21. It's all right to fight someone if they stole from you.	0.65				
22. Wrong for a money to stop you from getting what you want.					
23. I could easily tell a convincing lie.					
24. Most of my friends don't have criminal records.					0.43
25. It's not wrong to hit someone who puts you down.	0.51				
26. A hungry man has the right to steal.	0.54				
27. Rules won't stop me from doing what I want.	0.54				
28. I have friends who have been to jail.			0.72		
29. Snitches get what they have coming.	0.61				
30. Taking what is owed you is not really stealing.	0.61				
31. I would not enjoy getting away with something wrong.					0.47
32. None of my friends have ever wanted to commit a crime.					
33. It's not wrong to fight to save face.	0.50				
34. Only I can decide what is right and wrong.				0.60	
35. I would run a scam if I could get away with it.	0.60				
36. I have committed a crime with friends.			0.60		
37. Someone makes you angry shouldn't complain if punched.	0.63				
38. A person should decide what they deserve out of life.				0.50	



39. I would commit a crime if I had a good reason.	0.58			
40. I have friends who are well known to the police.		0.48		
41. Not wrong beating up someone who asks for it.	0.74			
42.It's only right to treat me like everyone else.				
43. I won't break the law again.				0.57
44. It's okay to fight someone who cheated you.	0.76			
45. A lack of money shouldn't stop getting what you want.				
46. I would enjoy fooling the police.	0.62			

**Appendix Table 9. EFA Model on Family & Cognitive**

<b>Item</b>	<b>F1</b>	<b>F2</b>	<b>F3</b>	<b>F4</b>	<b>F5</b>
1. Family activities difficult because we misunderstand each other.		0.52			
2. In times of crisis we can turn to each other for support.		-0.65			
3. We cannot talk to each other about the sadness we feel.		0.60			
4. Individuals are accepted for what they are.		-0.46			
5. We avoid discussing our fears and concerns.		0.60			
6. We can express feelings to each other.		-0.74			
7. There are lots of bad feelings in the family.		0.62			
8. We feel accepted for what we are.		-0.64			
9. Making decisions is a problem for our family.		0.65			
10. We are able to make decisions about how we solve problems.		-0.71			
11. We don't get along well together.		0.69			
12. We confide in each other.		-0.73			
1. It's okay to hit someone who insults you.	0.54				
2. Stealing to survive is okay.	0.48				
3. I'm not likely to commit a crime in the future.					0.48
4. I have a lot in common with people who break the law.					
5. There's nothing wrong with beating up a snitch.	0.65				
6. A person can take what is owed, even if they have to steal.	0.57				
7. I would keep any amount of money I found.					
8. None of my friends have committed crimes.			-0.63		
9. Sometimes you have to fight to keep your self-respect.	0.45				
10. I should be allowed to decide what's right and wrong.					
11. I could see myself lying to the police.	0.50		0.32		
12. I know several people who have committed crimes.			0.67		
13. Someone who makes you very angry deserves to be punched.	0.62				
14. Only I should decide what I deserve.					
15. In certain situations, I would try to outrun the police.	0.56				
16. I wouldn't steal, and I would hold it against anyone who does.					
17. People who get beat up usually had it coming.	0.50				
18. I should be treated like anyone else, no matter what I've done.				0.42	
19. It's okay to cheat certain people.	0.57				
20. I always feel comfortable around criminal friends.	0.40				
21. It's all right to fight someone if they stole from you.	0.67				
22. Wrong for a money to stop you from getting what you want.					
23. I could easily tell a convincing lie.					
24. Most of my friends don't have criminal records.			-0.33	0.37	
25. It's not wrong to hit someone who puts you down.	0.48				
26. A hungry man has the right to steal.	0.51				
27. Rules won't stop me from doing what I want.	0.57				
28. I have friends who have been to jail.			0.72		
29. Snitches get what they have coming.	0.63				
30. Taking what is owed you is not really stealing.	0.61				
31. I would not enjoy getting away with something wrong.					0.43
32. None of my friends have ever wanted to commit a crime.				-0.49	
33. It's not wrong to fight to save face.	0.52				
34. Only I can decide what is right and wrong.					0.42
35. I would run a scam if I could get away with it.	0.60				
36. I have committed a crime with friends.			0.61		
37. Someone makes you angry shouldn't complain if punched.	0.61				
38. A person should decide what they deserve out of life.					
39. I would commit a crime if I had a good reason.	0.60				

40. I have friends who are well known to the police.		0.49	
41. Not wrong beating up someone who asks for it.	0.74		
42. It's only right to treat me like everyone else.			0.43
43. I won't break the law again.			0.53
44. It's okay to fight someone who cheated you.	0.75		
45. A lack of money shouldn't stop getting what you want.			
46. I would enjoy fooling the police.	0.64		

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**Appendix Table 10. EFA Model on Anger & Cognitive**

Item	F1	F2	F3	F4	F5
1. When I really lose my temper, I am capable of hitting or slapping		0.55			
2. I get mad enough to hit, throw, or kick things.		0.78			
3. I easily lose my patience with people.		0.72			
4. If someone doesn't ask right way, I avoid, delay, or not do it .		0.49			
5. At times I feel I get a raw deal out of life		0.54			
6. When I get mad I say threatening or nasty things.		0.70			
1. It's okay to hit someone who insults you.	0.47				
2. Stealing to survive is okay.	0.46				
3. I'm not likely to commit a crime in the future.					0.54
4. I have a lot in common with people who break the law.					
5. There's nothing wrong with beating up a snitch.	0.63				
6. A person can take what is owed, even if they have to steal.	0.58				
7. I would keep any amount of money I found.					
8. None of my friends have committed crimes.			-0.60		
9. Sometimes you have to fight to keep your self-respect.					
10. I should be allowed to decide what's right and wrong.					
11. I could see myself lying to the police.	0.46				
12. I know several people who have committed crimes.			0.68		
13. Someone who makes you very angry deserves to be punched.	0.57				
14. Only I should decide what I deserve.				0.58	
15. In certain situations, I would try to outrun the police.	0.51				
16. I wouldn't steal, and I would hold it against anyone who does.					
17. People who get beat up usually had it coming.	0.44				
18. I should be treated like anyone else, no matter what I've done.					
19. It's okay to cheat certain people.	0.59				
20. I always feel comfortable around criminal friends.	0.40				
21. It's all right to fight someone if they stole from you.	0.58				
22. Wrong for a money to stop you from getting what you want.					
23. I could easily tell a convincing lie.					
24. Most of my friends don't have criminal records.					
25. It's not wrong to hit someone who puts you down.	0.48				
26. A hungry man has the right to steal.	0.51				
27. Rules won't stop me from doing what I want.	0.58				
28. I have friends who have been to jail.			0.73		
29. Snitches get what they have coming.	0.61				
30. Taking what is owed you is not really stealing.	0.60				
31. I would not enjoy getting away with something wrong.					0.45
32. None of my friends have ever wanted to commit a crime.			-0.47		
33. It's not wrong to fight to save face.	0.47				
34. Only I can decide what is right and wrong.				0.59	
35. I would run a scam if I could get away with it.	0.64				
36. I have committed a crime with friends.			0.64		
37. Someone makes you angry shouldn't complain if punched.	0.58				
38. A person should decide what they deserve out of life.			0.50		
39. I would commit a crime if I had a good reason.	0.59				
40. I have friends who are well known to the police.			0.50		
41. Not wrong beating up someone who asks for it.	0.71				
42. It's only right to treat me like everyone else.				0.34	0.32
43. I won't break the law again.					0.56
44. It's okay to fight someone who cheated you.	0.73				
45. A lack of money shouldn't stop getting what you want.					
46. I would enjoy fooling the police.	0.66				

### Appendix 11. Gender and Race and Ethnicity Invariance Tests

<b>Domain</b>	<b>Group</b>	<b>Invariance Test</b>	<b><i>df</i></b>	<b>CFI</b>	<b>TLI</b>	<b>RMSEA</b>
<b>Trauma</b>	Gender	Scalar invariance	108	0.97	0.97	0.04
<b>Trauma</b>	Race/Ethnicity	Scalar invariance	236	0.96	0.96	0.05
<b>Anger</b>	Gender	Scalar invariance	28	0.99	0.99	0.04
<b>Anger</b>	Race/Ethnicity	Scalar invariance	66	0.99	0.99	0.03