



**Washington Association of Juvenile Court Administrators**

**PACT Validation and Weighting Results**

**Technical Report**

**Deliverable 1: Updated PACT Risk and Needs Assessment**

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## TABLE OF CONTENTS

SECTION	PAGE NUMBER
<b>EXECUTIVE SUMMARY</b>	1
<b>INTRODUCTION</b>	3
Issues of Prior Risk Assessment	3
Customization Solutions	4
Needs Assessment	5
<b>METHODS</b>	7
Sampling Frame	7
Analytical Plan	8
Statistical Prediction Algorithms	9
Validation	9
Risk Level Category (RLC) Cut Points	11
Needs Assessment	13
Needs Assessment Development	13
Needs Models	14
Need Level Categories (NLCs)	14
<b>RESULTS</b>	14
Prescreen Risk Prediction Models	14
Full PACT Risk Prediction Models	18
Risk Level Categories (RLCs)	19
Needs Assessment	21
Factor Analysis	21
Criminogenic Needs Models	27
Needs Level Categories (NLCs)	28
<b>CONCLUSION</b>	29
Recommendations and Considerations	30
 <b>Figures</b>	
Figure 1. Illustration of Aggregate Risk Score Distribution and Cut Point Creation	10
Figure 2. PACT Hierarchical RLC Design	11
Figure 3. Diagram of Risk and Needs Scoring Process	13
Figure 4. School Needs	22
Figure 5. Association Needs	23
Figure 6. Family Needs	24
Figure 7. Alcohol & Drug Needs	25
Figure 8. Mental Health Needs	26
Figure 9. Cognitions & Behaviors Needs	27
 <b>Tables</b>	
Table 1. RLC Operationalization	11
Table 2. Pre-Screen Risk Models	14
Table 3. Pre-Screen Modeling Results	17
Table 4. Full Assessment Modeling Results	19
Table 5. Hierarchical RLC Proportions and Recidivism	20
Table 6. Three Category RLC Comparison	21
Table 7. Needs Model Domain AUC Values	27
Table 8. Needs Level Category (NLC) Proportions	28

## **Appendices**

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Appendix I.	A1
Appendix II.	A3
Appendix III.	A26
Appendix IV.	A34
Appendix V.	A50
Appendix VI.	A87

## EXECUTIVE SUMMARY

In 2017, the Washington State Juvenile Court Administrators (WAJCA) contracted with the Washington State Institute for Criminal Justice to update and expand the utility of their risk and needs assessment tool – the Positive Achievement Change Tool (PACT). The expansion of the tool was outlined to improve predictive accuracy, make use of locally collected data, and improve the functionality of instrument's design. The contract outlined two deliverables: (1) the creation of a needs assessment; and (2) the exploration of a responsivity assessment tool. This technical report provides a description of the work completed for Deliverable 1 – development of a needs assessment.

The initial needs assessment used by the WAJCA was built in 1997 to screen out/divert low-risk youth and provide a detailed assessment of needs for moderate and high-risk youth. This tool has been successfully utilized for two decades and adopted in over 20 states. However, the model was built to be theoretical in nature, where items, responses and domains were to be updated once sufficient data was collected. In 2015, Hamilton, van Wormer, and Barnoski explored the advancement of the risk assessment tool, outlining methods of improving prediction. The successful exploration led to the proposed expansion of the PACT's functionality. Specifically, the development of needs domains that would further improve intervention matching and, in turn, reduce recidivism was highlighted.

Based on prior findings with adult assessment tools (Hamilton et al., 2016a; Hamilton et al., 2017), we sought to *tailor* the PACT for the WAJCA youth, adapting the standard set of items to fit the population's prevalence of risk and needs factors. Essentially, our work modifies the theoretically composed tool, removing items that are not predictive and reforming new items and domains that improve performance and stakeholder buy-in. Several mechanisms were applied during this customization process, including: 1) outcome specificity; 2) gender responsivity; 3) tool variations; and 4) a stand-alone dynamic needs assessment.

We first sought to update the exploratory work completed for the risk assessment. Using subject Matter Expert (SME) input, new Prescreen and Full PACT Assessment tools were crafted. Based on an updated design, we modeled Prescreen items to increase prediction and divert low-risk youth. The Full PACT is then used to identify the type and level of risk for moderate and high-risk youth, while further identifying additional youth for diversion.

Based on Risk-Need-Responsivity (RNR) concepts, first developed by Andrews and Bonta (2010), we then sought to develop a specified needs assessment to supplement risk prediction. By using dynamic items drawn from each assessment domain in the Full PACT, a needs-only assessment tool identifies desired changes within the programmatic needs of youth. Empirical testing was then used to establish the existence and strength of each domain, outlining the scales and subscales within the patterns of youth responses. The identified items are then assessed for their criminogenic associations with recidivism, identifying each domain's ability to predict reoffending. When paired with the risk assessment, the *stand-alone needs tool* has greater potential to improve youth outcomes and more efficiently utilize limited programming resources. Completing these goals was the outlined objective of *Deliverable 1*.

Our results revealed the achievement of the proposed work. Specifically, we found that:

- Updated Prescreen models improved accuracy of prediction by 2% and reduced the set of items needed to identify low-risk youth.
- Full Assessment findings identified improved variable combinations/scales and increased the strength of recidivism prediction, on average, by 6%.
- Updated needs assessment domains were created and indicated to possess construct validity, reduced the number of domains, and provide a greater association between domains and available interventions.

- Needs models demonstrated criminogenic prediction, providing an assessment of needs that is specified for youth's gender and most likely recidivism type.

Collectively, these findings indicate the updated risk and needs models increase accuracy of prediction, provide a greater underlying context for program matching and an assessment of needed interventions. Furthermore, the updated domain and needs model scoring, consisting of only dynamic items, provides criminogenic prediction for youth receiving the Full Assessment. Further, recidivism outcome types are better predicted by some domains than others, allowing for the ranking of domain importance in reducing recidivism. The ranking of domains is considered to be a substantial benefit of the updated models, allowing case managers to prioritize programming and intervention provision that will have the greatest impact for a given type of youth.

While further SME input is needed to finalize the assessment tools created, the presented findings represent a culmination of work developed to improve prediction of recidivism and assist with case management. The new design of the instrument adds complexity in an effort to provide more detailed information to case managers and, in turn, improve youth outcomes. This work represents the first deliverable and additional work will be completed to establish how needs and youth profiles interact with programming. Our intent is to identify both specific and general responsiveness of available WAJCA evidence-based practices.

Recommendations and further considerations surround additional SME collaborations to further develop and establish Risk Level Categories and Needs Level Categories, keeping category proportions in line with current/future policies, practices, and resources. We suggest further consideration for the WAJCA definition of recidivism, exploring mechanisms for additional optimization. Also, there is an opportunity to combine findings with that of the other juvenile justice population, Juvenile Rehabilitation (JR), indicating risk and need level that are representative of the juvenile justice population a whole. Additional consideration should also be given to the prediction of future sex offending. While the current models do not provide said model prediction, the development of a PACT sex offense risk and need models may provide greater utility of instrument content. Finally, it is suggested that a program-gap analysis be outlined for future examination. This type of analysis may be used to examine whether the right types of interventions are available and help reorganize resources to address youth needs.

## INTRODUCTION

The use of risk and needs assessment has grown substantially in the last two decades. Since their initial expansion from adult to juvenile tools and from static-only to the inclusion of dynamic items, assessments have advanced to provide ever-increasing detail and prediction (see Andrews & Bonta, 2010; Hamilton et al., 2016). Working with the Washington State Juvenile Court Administrators (WAJCA), Barnoski (2004) provided one of the initial advances for risk assessment generally and juvenile assessments specifically, through the creation of the Washington State Juvenile Court Administrators Risk Assessment (WAJCA-RA). At the time of its development, the WAJCA-RA was viewed as one of the most advanced tools, pairing risk, need, and protective items in both a prescreening and full assessment format.

Due, in part to these advances, the assessment instrument was adopted by several states, developed for software applications, and rebranded by two companies (ORBIS & Vant4ge) and several states (e.g. Oregon, Utah, and Iowa). Since its inception, the instrument has remained a valuable tool for diverting low-risk youth and assessing programming needs. However, best practices outline the need to reevaluate instrument performance and make modifications where needed. Until recently, the WAJCA-RA/PACT has remained relatively unchanged since its initial development.

Beginning with an exploratory analysis in 2015, the WAJCA contracted with Washington State University (WSU) to explore the advancement of the PACT. Using a large sample (N= 32,699) of Washington State probation youth, advanced statistical algorithms, as well as gender and outcome specific modeling, initial findings indicated substantial improvements in prediction strength (Hamilton, van Wormer, & Barnoski, 2015). In 2017, WAJCA again contracted with WSU to refine the models developed and advanced prediction further, through the creation of a needs and responsivity assessment. The current study provides the results from Deliverable 1 – development of a needs assessment.

### Issues of Prior Risk Assessment

The use of empirical, or statically derived, assessment instruments has evolved through the development of sequential generations (Andrews, Bonta, & Wormith, 2006). First generation assessments relied on the discretion of practitioners to determine an offender's likelihood of reoffending, creating idiosyncrasies and a lack of standardization (Schwalbe, 2007). Subsequent generations introduced the use of statistically derived risk scores, which, in turn, allow the practitioner to develop risk-appropriate supervision modalities (Schwalbe, 2007). The transition from second to third generation risk assessment instruments established the inclusion of dynamic factors, allowing for greater predictive accuracy and programmatic approaches to reduce recidivism (Schwalbe, 2008).

It is important to note that while most advancements strive to increase utility, moving from one generation to the next does not necessarily increase an instrument's predictive strength (Brennan, Dieterich, & Ehret, 2005; Hamilton et al., 2016). Specifically, tools implemented without an understanding of local context and agency needs, lack fidelity upon implementation (Taxman & Belenko, 2011). An understanding of not just the likelihood but also the type/severity of recidivism is another important consideration (Barnoski & Drake, 2007; Barnoski, 2012; Hamilton, van Wormer, & Barnoski, 2015; Hamilton et al., 2016a). Finally, the varying pathways and predictors of males and females may influence prediction and programming needs of youth (Broidy, Payne, & Piquero, 2018; Chesney-Lind & Rodriguez, 1983; Funk, 1999; Reisig, Holtfreter, & Morash, 2006; Schwalbe, Fraser, & Day, 2007). Addressing these considerations, with the assistance of a Subject Matter Expert (SME) group, will inform and guide proper implementation of a new instrument, consisting of modifications of an existing tool.

### *Local data*

In an effort to move risk/needs assessment work into the next generation of effectiveness, there is a notable and current gap of evidence. Specifically, most instrument developers view their tools, items, and

responses as static, or part of a product package (Hamilton, et al., 2016a). Rooted in psychological assessment, criminal and juvenile justice assessments take a diagnostic approach, counting an individual's attributes/scores until a threshold is exceeded, and the person is then identified by a risk level (e.g. high, moderate, and low). A primary assumption of psychological assessments is that the outcome/condition is organic, or universally observed within all humans that have a similar outcome/condition (Desmarais & Singh, 2013; Hamilton et al., 2016a; Hamilton et al., 2017). However, when recidivism is the outcome predicted, local statutes and population variations will alter the items, responses, outcome descriptions, and definitions, as well as the importance of each item included in the prediction equation. While developed for Washington State, the PACT items and responses were viewed as 'theoretical' at the time of development and intended to be adjusted and refined once a sufficient sample of assessment and recidivism data could be gathered (Barnoski, 2004).

Furthermore, there is a lack of understanding among practitioners and juvenile administration concerning how risk assessment tools are designed or developed and the ways in which predictive performance is affected. When a tool is developed and initially validated, the items are selected from a pool of potentials. Those selected may function accurately for the development population in which the tool was created to serve. However, there has been limited research to date that indicates how potential variations in items or weights of importance differ across other non-development populations. When validation statistics are presented in the literature, a site implementing a tool may perceive that the tool is universally valid and will perform similarly for their agency. However, recent findings have indicated several instances when that was not the case (Barnoski & Drake, 2007; Ostermann & Herrschaft, 2013).

Attaining an optimal level of predictive performance, or validity, is the central goal for risk assessment developers. We contend that the success of the PACT (or any instrument) is directly related to its assessed accuracy where applied. Based on prior findings using both adult and juvenile samples (see Barnoski, 2010; Barnoski & Drake, 2007; Hamilton & van Wormer, 2015; Hamilton et al., 2016a) several customizable solutions have been identified. When implemented, these solutions may provide a small-to-substantial predictive performance impact. Moreover, the additive effects of customized additions have the potential to produce an optimal design and improve predictive performance for the sample, jurisdiction, and the juvenile justice system.

### **Customization Solutions**

A recent trend in assessment development involves a process of: adjusting risk category thresholds, selecting items and optimizing current response weights of a tool to better tailor it to local population variations and jurisdiction needs (Hamilton et al., 2016a; Hamilton et al., 2017). *Instrument tailoring* is the process of taking the previously described off-the-shelf tool and adapting the standard set of items to fit the population's prevalence of risk and needs factors. This process optimizes the predictive performance of the tool for the local jurisdiction and is viewed as an assessment of the jurisdiction's responsivity to the tool (Hamilton et al., 2017). The central takeaway is that a theoretically composed tool (such as the PACT) can be modified from its original form, removing items that are not predictive and adding new items that improve performance and stakeholder buy-in. There are several mechanisms that, when applied, customize a tool for an agency's population. Specifically, we focus our review and eventual testing of instrument development as it pertains to: 1) outcome specificity, 2) gender responsivity, 3) tool variations, and 4) a stand-alone dynamic needs assessment.

#### *1) Outcome Specificity*

The creation of different models is a vital step in the validation process, as it is important to know if a person has a higher propensity to commit a certain type of offense (e.g. property vs. violent offending). By 'digging deeper' and narrowing in on new models, limited resources can be more strategically applied. Supervision levels, techniques and treatment/interventions can also become more targeted. The targeted outcome for this project was reconvictions for both felony and misdemeanor charges, which was defined as 'any' recidivism. More specified model variations are created, and each outcome modeled independently,

selecting and weighing items separately to create increased prediction strength for the outcome in question. Based on discussions with SMEs, we present risk assessment modeling variations for five outcomes, including: felony, violent, property, drug, and ‘any’ recidivism.

## 2) *Gender responsiveness*

Another variation worthy of specified modeling is gender. Gender responsiveness has been discussed since the emergence of fourth-generation tools (Baglivio & Jackowski, 2013). This awareness has combined with growing attention on an increased number of female youth coming into contact with the juvenile justice system (OJJDP, 2010; Schwalbe, 2008). The potential disadvantage of using instruments across genders is that gender-neutral instruments tend to overestimate risks of girls, which leads to harsher dispositions and lower predictive validity (Leiber & Mack, 2003; Schwalbe, 2008; Schwalbe, Hatcher, & Maschi, 2009). Furthermore, studies that support the needs of gender responsive instruments have identified substantially different gender risk profiles, gendered decision making, and gendered practices (Cottle, Lee, & Heilbrun, 2001; Flores, Travis, & Latessa, 2003; Funk, 1999; Leiber & Mack, 2003; Piquero, Gover, MacDonald, & Piquero, 2005; Mears, Ploeger & Warr, 1998; Schwalbe, 2008; Schwalbe, Fraser, Day, & Cooley, 2006; Thompson & McGrath, 2012). The results of these studies indicate that risk assessment instruments that ignore differences between genders are not suitable for girls’ risk assessment because their gender biased scoring results in low predictive validity. Based on prior research (Hamilton et al., 2016; Hamilton van wormer, & Barnoski, 2015), separating males and females into individual samples to produce *gender specific* models, both improves the context and accuracy of prediction. To account for gender specificity of prediction, we created two sets of models to study gender variations. Models for each of the five outcomes described were computed for both samples independently, selecting and weighting items separately, across gender.

## 3) *Tool variations*

As indicated, the PACT consists of a Prescreen and a Full Assessment. Currently, only the Prescreen tool is scored to assess a youth’s risk level and these prescreen scores are indiscriminate in the selection and weighting of items. That is, most items are provided a weight that represents the response value. For example, a youth with no prior felonies is scored ‘zero’, those with one are scored ‘one’, and those with two or more are scored ‘two’. Some items make use of weights that are not single unit increases (i.e. 0, 2, & 4) but this weighting structure was created based on an ‘educated guess’ (or theoretical design) and not scored using an underlying statistical model. We sought to explore potential adjustments to the PACT scoring schematic in an effort to improve predictive accuracy. To make potential adjustments, youth that received Prescreen assessments were analyzed, modeling predictors for ‘any’ recidivism. Youth receiving a full PACT were then analyzed, modeling predictors for all five outcomes and for each gender’s subsample, resulting in a total of 10 prediction models. Along with the validation of the current PACT scoring formulations, we present predictive accuracy findings of the updated PACT Prescreen and Full Assessment models, demonstrating improved predictive validity through alternative scoring schematics.

## **Needs Assessment**

While the concept of assessing needs has been a part of both adult and juvenile tools for over three decades, the appropriate use of needs, as a method to identify programmatic needs, has not been fully achieved. Many tools misuse the underlying intent, claiming to provide a ‘risk-needs’ assessment simply by including dynamic items. As part of the Risk-Need-Responsivity (RNR) model, Andrews and Bonta (1994; 2010) outlined several components necessary for the assessment and use of needs within an instrument’s functionality, which have been further advanced by recent findings.

### 1. *Needs are temporary attributes of an offender that affect the likelihood of law-violating behavior and recidivism.*

Needs items can be used to identify qualities of offenders that match service and treatment interventions, where the intended purpose of an intervention is to provide a method to ameliorate the offender’s need within a given domain(s) (Andrews & Bonta, 2010). However, the intent of a *needs assessment*



is different than that of a risk assessment. Therefore, the mixture of static and dynamic items within domain subscales would represent a departure from the original, conceptual intent proposed for RNR assessments.

*2. Needs domains must be structured and tested to assess their underlying construct.*

Assessment tools are often sub-divided into *domains*, with each domain containing a set of items that represent an underlying construct, such as education, aggression, or family needs. Once assessed, scores from these item subsets describe the youth's needs for programming and interventions in a given area. The RNR model suggests that programming and interventions provided to address a given need area will reduce scores for said subscale and, in turn, the youth's risk of recidivism. To achieve this goal, one must assume that the items within a given domain are measuring the underlying construct (e.g. education, aggression, or family needs) and not that of a different need (e.g. attitudes, mental health, or skills). Furthermore, one must assume that items within a domain are comprehensive and work together to form a single scale.

As described, the initial PACT tool was developed with nine needs domains (plus criminal history) as a theoretical model, to be adjusted once sufficient data has been collected. Often overlooked by assessment developers are well-established empirical methods used to establish and structure needs domains. Through an examination of item interrelationships, research can establish and confirm the existence of needs domains and their relative strength for measuring their underlying concepts.

*3. Criminogenic needs scales must be empirically modeled.*

While offenders may struggle with a multitude of needs, only those which are empirically related to recidivism should be included in needs assessments. Targeting needs and/or including additional items in a scale that do not influence a youth's propensity to reoffend creates prediction noise and reduces the tool's performance. Statistical models, assessing the association of needs to recidivism, is a requirement of the RNR model and advanced statistical models should be considered, examining how needs combine within a predictive domain (Hamilton et al., 2016b).

*4. Weighting coefficients can improve performance.*

As described previously, tailoring the needs assessment to a population (by weighting items and responses) provides greater prediction, takes into account empirical and theoretical nuances of the population, and can more accurately assist case management (Hamilton et al., 2016b).

*5. RNR theory can be advanced with contemporary concepts, such as outcome and gender specific modeling.*

As risk assessment has evolved, the concepts of outcome specific and gender responsive modeling are key contributors to the understanding of individuals' specific pathways to reoffending. We contend that the solution is the use of multiple needs assessment models, selecting and weighting items separately for each outcome and gender to identify the complexity of prediction and improve performance.

Based on RNR concepts, first developed by Andrews and Bonta (2010), we sought to develop specified needs assessment to supplement risk prediction. By using dynamic items drawn from each assessment domain in the full PACT, a needs-only assessment tool will identify desired changes within the programmatic needs of youth. Empirical testing is then used to establish the existence and strength of each domain, outlining the scales and subscales within the patterns of youth responses. The identified items are then assessed for their criminogenic associations with recidivism, identifying a domain's ability to predict recidivism generally and the methods of optimizing needs items to predict for specified outcomes (i.e. felony, violent, property, and drug recidivism). An assessment focused on dynamic items, established and confirmed domains, and criminogenic needs will better guide assignment to interventions, reducing needs, and in turn, reducing a youth's overall risk to recidivate. When paired with the risk assessment, a *stand-alone needs tool* has greater potential to improve youth outcomes and more efficiently utilize limited programming resources. Completing these goals was the outlined objective of *Deliverable 1*. In the next section we outline the development of an updated PACT risk and needs assessment model.

## METHODS

To complete Deliverable 1, a robust research design was developed. First, we created a sample frame of youth that completed the Prescreen or Full PACT Assessment, as well as their associated recidivism. Next, we examined potential item combinations and developed the updated risk assessment models. This process was completed for the Prescreen and again for the Full PACT assessment, further modeling felony, violent, property, drug, as well as any recidivism outcomes. Cut points, or thresholds, were then set to determine Risk Level Categories (RLCs) with an updated, hierarchical design. Next, we developed the needs assessment. First, we identified dynamic items, creating a separate dataset. We then analyzed the underlying constructs/domains to identify and confirm the updated scales and sub-scales of youth needs. Needs items and scales were then modeled, by domain, outcome and gender, to predict recidivism. Finally, needs model cut points were established, outlining high, moderate and low Needs Level Categories (NLCs). The current section describes the sampling frame and analytic plan.

### Sampling Frame

Working with the Washington State Center for Court Research (WSCCR), a sample of youth that completed Prescreen and Full Assessment PACTs were identified. Based on SME input, the sample frame was limited to assessments completed between 2005 and 2015, to coincide with a 2005 policy modification<sup>1</sup> and to allow for a sufficient follow-up duration needed to observe recidivism. To coincide with statistical modeling assumptions, we focused our analysis on ‘initial’ assessments, removing reassessments from the available data. Recidivism was defined as a new charge committed within the first 18 months following the initial assessment date, in which an adjudication was indicated within 12 months of the charge date. The crime types were also identified and categorized as ‘any’ (misdemeanor or felony), ‘any’ felony, violent, property, and drug. The Revised Code of Washington (RCW) was provided for each charge and the Washington State Institute of Public Policy’s (WSIPP) severity index was used to categorize offense types. Youth without the requisite 30-month follow-up period following the initial assessment were deemed ineligible for study inclusion. Using these criteria, we identified a Prescreen sample of 64,746 and a Full Assessment sample of 50,862 youth. To create gender specific prediction models, separate Prescreen and Full Assessment samples were created for male and female youth.

### *Descriptive Statistics*

Using the samples described, PACT items and responses, as well as recidivism measures, were examined. Univariate descriptive statistics for prediction for all models are presented in the Appendices; where Appendix I provides Prescreen, and Appendix II provides Full Assessment descriptive statistics. It should be noted that all youth are provided a Prescreen assessment, while only moderate or high-risk youth (assessed with the current PACT scoring) are provided a Full Assessment. Although some low-risk youth are provided a Full Assessment, that is more the exception than a common occurrence. Within both tables, the original value indicated for each item, along with columns indicating the proportions of youth identifying each response, items’ means and standard deviations, are provided for the total sample, as well as males and females separately. While there are many items and response values to review in both tables, generally, these tables serve as a report of all items possible for the inclusion in the risk and needs models, where potential needs assessment items are indicated in the ‘dynamic’ column.

### Analytical Plan

Our analysis was then completed in an effort to construct three sets of models. First, we developed the updated risk assessment models. We began by testing modeling assumptions. In particular, due to the large number of items used ( $k=201$ ) multicollinearity was a concern. The Variance Inflation Factor (VIF) was utilized to test multicollinearity. Results indicated no issues with multicollinearity for the items to be utilized in the prediction models.

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<sup>1</sup> In 2005, a substantial upgrade was made to data collection, training and quality assurance procedures for the PACT.

Next, to identify how items and responses work together and to form risk scales, Principle Component Analyses (PCA) were completed. While other methods of scale creation/data reduction exist, PCA is considered ideal when the purpose of the data analyses is to use minimum component(s) to explain the maximum variance. When creating the risk assessment tools, our purposes were to combine and reduce the number of assessment items in an effort to reduce labor, create coding consistency and increase face validity. These needs aligned with the PCA approach.

### *Statistical Prediction Algorithms*

Next, the updated Prescreen tool was developed, selecting and weighting each item found to be predictive of ‘any’ recidivism. Using a customized statistical algorithm, models were created, optimizing risk scale development to predict ‘any’ recidivism for male and female specific samples. The set of algorithms utilized are part of a customized code, called a ‘batch algorithm’, in which WSICJ has developed and implemented successfully in previous analyses. The term *batch* references the use of multiple algorithms somewhat simultaneously. As prior research has indicated (Hamilton et al., 2016a; Hamilton, van Wormer, 7 Barnoski, 2015), algorithm performance varies from sample-to-sample; where some algorithms work best in small versus large samples, others with a small versus large numbers of items, and still others with frequent versus infrequent recidivism events (i.e. base rates).

The first model type, termed the LASSO (least absolute shrinkage and selection operator), is designed to handle a high volume of items from which to select and include in the final model. In order to achieve a balance of both predictive power and high dimensionality (high volume of items selected), the algorithm penalizes items with shared variance explaining the output, shrinking the weights for one to make room for the other. It can shrink a weight as far as zero, effectively eliminating it from the model entirely.

Another technique, termed ridge regression, performs similarly to the LASSO, only there is a constraint preventing the model from reducing any weights to zero. Weights can approach zero but never equal zero, which means all items are retained in the final model. A technique called elastic net was also used, which is a compromise between LASSO and ridge. Some weights can be reduced to zero, similar to LASSO, but more are retained than is achieved with LASSO.

A fourth technique used is the LARS (least-angle regression). LARS is a stage-wise procedure that selects items and weights them in a sequence. First, it adds and weights the item with the highest predictive power, weighting to minimize error in prediction of the outcome. After that, it adds a second item, a third item, and so on, each time selecting and weighting each additional variable in order to minimize the remaining error left in the entire predictive model. The model stops (converges) once no further item reduces the error.

The fifth method was a boosted regression. Boosting is a meta-algorithm, which runs multiple sub-algorithms in a series, where each new model in the series learns from the preceding one. Each model computes and weights the items in the instrument. The predictive performance of each model on each case (offender) is tested, and the test results are passed to the following model. Cases that the preceding model predicted accurately are ignored in the following model, having already made the correct prediction. Instead, model weights in the next algorithm train more heavily on cases that were inaccurate, maximizing the number of correct predictions over the sequence of steps. Some items are dropped from the selection pool in this way, and the number of iterations in the series is fixed at a certain number. For the purpose of this research, 100 boosted models are used.

Finally, a custom step-wise procedure was written to maximize predictive performance. The amount that each item increases the predictive performance of the model is computed, selecting the items that add the most to the instrument’s predictive power on a test dataset. Predictive power was measured via a statistic called the ROC AUC (receiver operating characteristics area under the curve). An AUC value of .5 is tantamount to be no more predictive than a coin toss, whereas an AUC value of 1.0 would be perfect predictive accuracy (see Rice & Harris, 2005). The model stops adding items once no further additions can increase the model AUC.

Given the variation in samples, items, and outcome base rates, we use a set of algorithms, each designed to provide a special feature that another may not<sup>2</sup>. If, for any given model, an item is selected, we identify it for another round of processing. In the second round, we take all selected items and enter them into a final boosted regression, which provides weights (or values) to each item in a given model. This process was completed twice for the Prescreen assessment, predicting ‘any’ recidivism for males and female and 10 times for the full PACT assessments, further modeling felony, violent, property, drug, as well as any recidivism outcomes for both males and females. Finally, each model is reviewed by a WAJCA created SME group, identifying items to be adjusted, added, or removed to improve face validity.

### *Validation*

Assessing the predictive performance of each model was conducted using a validation technique referred to as K-fold cross-validation. Generally, there are two steps needed to validate a risk assessment instrument: training of the risk model based on a set of data and then testing the created models on a new set of data that the model has never seen before (to assess how well it makes correct predictions). Simpler methods that employ this technique often use a split-sample procedure, separating the data into two equal halves: one for training, the other for testing. The limitation with this method is that it does not use all of the data available for each of the two steps, only one half.

A method that resolves this limitation is K-fold cross validation, which partitions the dataset into 10 equal parts at random. Nine of the parts are used for training the risk model, with the remaining part used for testing. This process is then replicated/repeated 10 times, with a different tenth of the data used for testing each time. The performance metrics of the predictions for each of the 10 subsets are then summarized to yield a single score. The performance metric used was the ROC curve and its associated AUC statistic. Industry standard identifies four ranges/effect sizes of AUC values – negligible (<.56), small (0.56-0.63), moderate (0.64-0.70), and large (>0.71) (see Rice & Harris, 2005). It is important to note that AUC statistics were also computed for the current PACT scoring, for the purpose of comparing improvements gained using updated modeling.

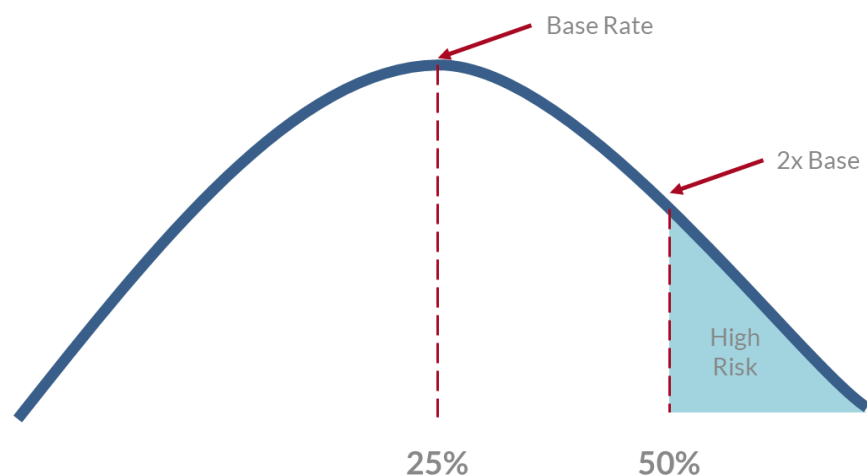
### *Risk Level Category (RLC) Cut Points*

Next, we set cut points, or thresholds, to determine RLCs (i.e. low, moderate and high). Briefly, all risk and needs instruments consist of a set of items and responses in which the individual is assessed. This can be completed with a review of the individual’s criminal history and the interview. While most tools are built on one sample, to be gender neutral, and with a single outcome, we built the updated PACT using multiple data sources and statistical algorithms used to predict recidivism on tens of thousands of offenders. Response values for each item of the assessment provide a score, where the scores for all responses are summed to create a total score. The total scores from each youth are then analyzed and their risk level, or category, is determined based on their score’s reference to all others in the sample. By identifying the collective distribution of total scores, we can identify the ‘aggregate’, or collection of scores, which often forms a normal distribution, or bell curve (see Figure 1).

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<sup>2</sup> It should be noted that for each of the models described above, modifications were made so that negatively weighted items are always dropped from consideration by the selection procedures. Items were coded in such a way so that positive relationships with recidivism should be expected based on criminological theory. Item weightings found not to be consistent with theory were eliminated from the item selection pool.

**Figure 1. Illustration of Aggregate Risk Score Distribution and Cut Point Creation**



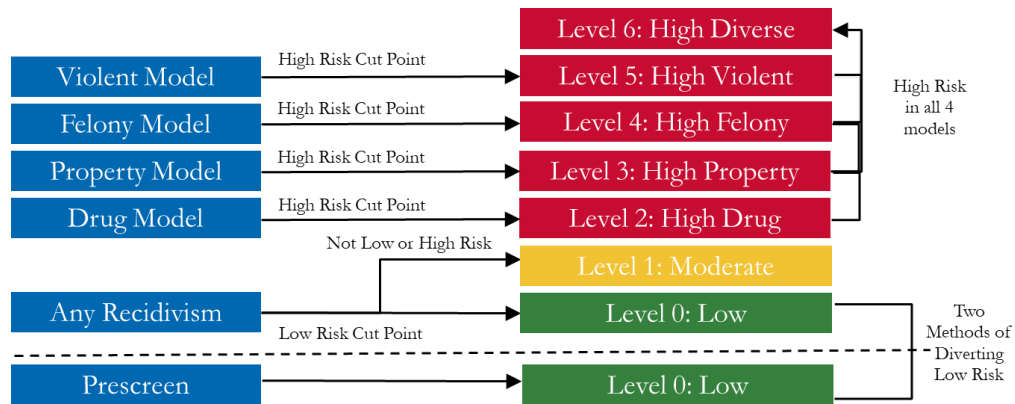
Cut points are then established to identify youth's RLC. To determine who is high-risk, varying metrics can be used, but the most accepted method is to set cut points in reference to the average rate of recidivism, or 'base rate'. The *base rate* is simply the rate of recidivism for the entire population, regardless of risk. The cut point is then set at a determined value above the base rate (typically two-to-three times). For example, if a risk assessment ranged from zero to 100, had an average risk score of 50, and a recidivism base rate of 25%, we would identify the risk score associated with a 50% probability of recidivism. If, for instance, the score associated with a 50% probability was 74, we would determine that anyone scoring 75 or above, would be identified as High Risk.

Based on our proposed *hierarchical* design, this process is completed for multiple outcomes, selecting and weighting items that are most predictive for felony, violent, property, drug and 'any' offense, identifying youth that are 'High Risk' for each outcome. Once cut points are set for each outcome, the RLC is determined based on the highest level (or severity) of risk. This design is organized to identify those youth that specialize, or have a propensity for one type of recidivism, versus those that are more opportunistic. First, a youth's Prescreen score will determine if they are low-risk and meet the criteria for diversion. They are then scored on the full PACT, and if they do not exceed the cut point on the 'any' recidivism, then they are identified to be low-risk and eligible for diversion<sup>3</sup>. However, if a youth exceeds the cut point on the drug model, they are identified to be Level 2 – High Drug. If they exceed the cut point for the property model they are identified to be Level 3 – High Property. If they exceed the cut point for the felony model, then they are identified to be Level 4 – High Felony. If they exceed the cut point for the violent model they are identified to be Level 5 – High Violent. Finally, if they exceed the cut point for all four high-risk models, then they are identified to be Level 6 – High Diverse. That is, if a youth exceeds the cut point on the violent models, they are identified to be Level 5 (high violent). If a youth exceeds more than one, but not all high-risk models, the highest RLC is selected. This hierarchical ranking of risk could be established based on the JCA's priority of recidivism prevention and is depicted in Figure 2.

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<sup>3</sup> This is additional method of diverting youth is created, by design, to act as a safeguard for those youth with a greater level of protective factors that are not captured by the Prescreen tool.

**Figure 2. PACT Hierarchical RLC Design**



Based on the outlined design, a review of outcome base rates and an understanding of the current RLC proportions, we operationalized the updated RLCs. Table 1 provides the operational definitions, base rate, and cut point for each model. Readers should note that risk model scores which exceed the cut point may possess a probability of recidivism that is equal-to-or-greater than the point listed in Table 1. Furthermore, to prevent over-classification, the base rate used is for the overall sample identified for all youth completing the Prescreen assessment and is gender-neutral.

**Table 1. RLC Operationalization**

RLC	Definition	Base Rate%	Cut point (Sample recidivism %)
High Violent	2X base rate	14	28
High Felony	2X base rate	16	32
High Property	50% base rate increase	19	29
High Drug	50% base rate increase	5	8
Moderate	Not High or Low Risk	--	--
Low	50% base rate reduction	34	17

Each RLC and cut point was then vetted by the SME group to determine the appropriate size of each category and the best reference point for high-risk categories. The SME group was also tasked to identify the impact that the updated design and RLCs will have on policy, supervision strategies and program placement criteria<sup>4</sup>. Readers should note that, throughout the development process, RLC comparisons between the current (original) and updated PACT scoring models are provided. Specifically, RLC proportions and rates of recidivism for each category are offered as a reference to identify the relative improvement of the updated models.

<sup>4</sup> At the time of writing this report, SME vetting of RLCs was still underway, where final placement may alter what is presented here.

## Needs Assessment

Before describing the methods used to create the needs assessment, it is first necessary to describe its design. The design is outlined to work with the risk assessment, allowing RLCs to then determine youth's needs. That is, a youth's most likely type of recidivism is linked to needs items that are predictive of that particular outcome type. This risk-to-needs design was developed previously (see Hamilton et al., 2016) and is described here as a *filtering process*.

### Needs Assessment Design

The development of the needs assessment takes advantage of the large pool of items collected as a part of the Full Assessment, restricting classification of needs to dynamic items. This instrument development method allows for an assessment of a youth's reduction in needs during the course of supervision. The proposed needs assessment development extends prior risk assessment efforts, constructing models separately for males and females, using multivariate item selection, analytic weighting, and specified prediction models for felony, violent, property, drug, and 'any' recidivism. While the exact items selected, and their weighted scores differ from the PACT risk assessment, the items selected are drawn from the same pool collected in the Full PACT Assessment<sup>5</sup>. The difference is that those calculated for needs provide scores within each of outlined domains and utilize *only* dynamic items. The following sections outline the details of that development process.

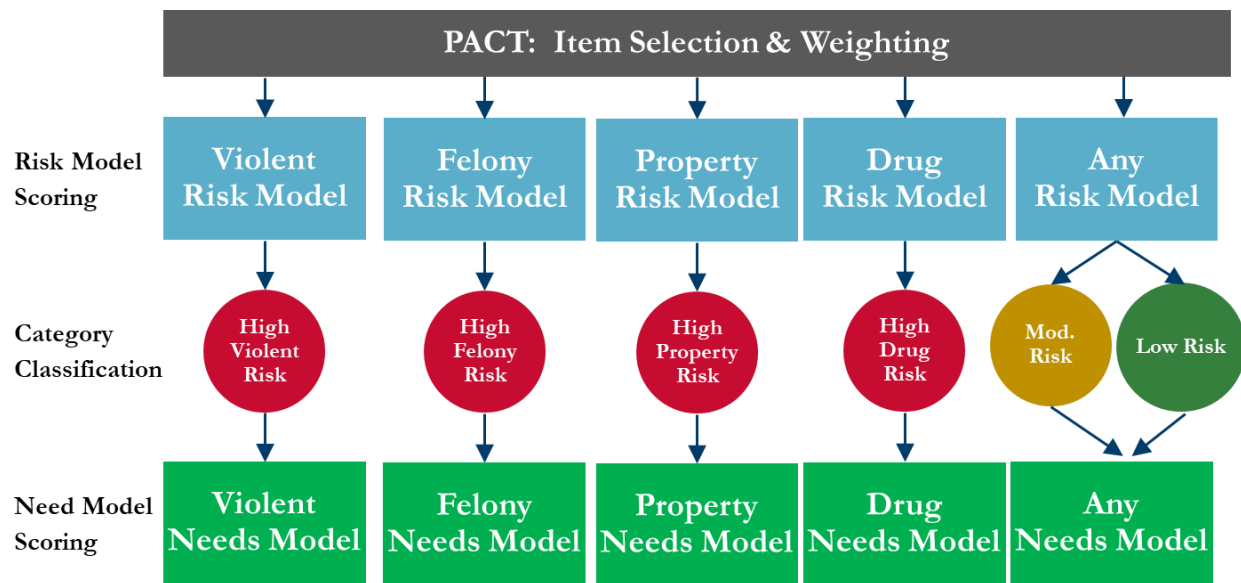
The utility of the needs assessment operates within an outlined continuum of the PACT assessment system. The application first uses static and dynamic items to determine an individual's risk score and classification level. The updated PACT design has four outcome-specific and two general recidivism prediction models. Using model specific algorithms, the individual's response data is weighted and processed into RLCs. More specifically, once an offender's responses have been collected on all items in the PACT assessment item pool, these responses are weighted and scored.

To illustrate further, if a given youth enters the JCA system and is assessed on the items in the Full PACT Assessment item pool, the PACT algorithms for each of the five models are then scored. For example, if a youth scores as 'high-risk' for both the Violent and Drug risk assessment models, the highest ranking would be selected, identifying the offender as Category 5 – High Violent. The Violent Needs Model algorithm would then be applied, and the software would return the offender's scores/classification needs (i.e., high, moderate, and low) within each domain that predicts violent recidivism. This process is diagrammed further in Figure 3.

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<sup>5</sup> Once assessment data are collected, developed software applications is needed to compute separate algorithms, for both risk and needs assessments.

**Figure 3. Diagram of Risk and Needs Scoring Process**



This filtering process from the general pool, to risk category, to needs scores provides additional specificity for case managers. The added complexity is necessary to allow case plans to focus intervention efforts on reducing an individual’s assessed criminogenic needs category, which is designed to have the greatest strength in predicting a youth’s specific recidivism risk type. However, despite the described complexity, this process all takes place in the background, where the work of scoring risk, classifying youth, and applying weighted needs scores is based on a system of algorithms computed through a unified software platform.

#### *Needs Assessment Development*

Following this design, we developed the needs assessment<sup>6</sup>. First, we identified a subset of dynamic items, creating a separate dataset. These items are identified in the Washington State Juvenile Court Assessment Manual (Version 2.1) as ‘Dynamic’. These items are currently subdivided into 10 domains – school, free-time, employment, relationship, family/living arrangements, mental health, attitudes/behaviors, aggression, and skills. As described, these domains were theoretically constructed and may not align with current standards for scale construction. To validate the appropriate number of items and domains, we analyzed the underlying constructs/domains to identify and confirm the development of updated scales and sub-scales of youth needs. This process was completed using both exploratory and confirmatory factor analysis (EFA & CFA). Both scales and single items were then modeled, by domain, outcome and gender, predicting recidivism. Again, predictive validity statistics are presented describing the accuracy of each scale. Finally, needs model cut points were created outlining high, moderate and low Needs Level Categories (NLCs). This section describes the analytic plan utilized to develop the needs assessment.

#### Factor Analysis

Determining the number of items and domains within a needs assessment is an important process. While one can use logic to generate questions and place them into categories, determining if the categories measure ‘youth needs’ is a more complex task. That is, the process is notably different from creating a risk assessment, as a risk assessment has an observable (manifest) outcome – recidivism. However, needs are subscales that do not have an observable outcome and thought to be indirectly related to recidivism. Due to the lack of a directly observable outcome, needs are defined as *latent constructs*. To determine the most

<sup>6</sup> While readers may note that the development of a needs assessment was the primary deliverable, due to the design of the needs assessment, the risk assessment was first updated and added to the project task list.



appropriate combination of items into domains, analytic approaches are necessary to identify and validate domains empirically.

In order to create and validate the construct validity of PACT needs domains, we completed two sets of analyses. First, we utilized EFA to identify the best combination of items and number of domains/scales. A second set of analyses, CFA, was then used to confirm, or validate, the existence and strength of the created scales. Specifically, this study tested the PACT's internal latent structure via rigorous psychometric analyses. Specified statistical indicators (model fit indices) were used to determine whether created scales meet industry standard thresholds. We further outline the relative strength of the construct validity findings. These model fit indices include the Comparative Fit Index (CFI), Tucker Lewis Index (TLI), Root Mean Square Error of Approximation (RMSEA), and associated rules to evaluate the goodness of the IRT/IFA models<sup>7</sup>. EFA model evaluation criteria also include the Kaiser-Guttman rule, goodness of fit, strength of the loading/cross-loading, and theory as foundation to facilitate the model evaluation process as suggested by Mei (2018). The scale reliability was estimated via the Cronbach's alpha coefficient.

### *Needs Models*

Following the creation of needs scales, we proceeded to develop needs models. Based on RNR concepts, each need item and scale must be determined to be criminogenic, or possess a statistical relationship with recidivism. Prediction models were computed within each domain's scales and items to determine their criminogenic relationship with recidivism. That is, separate domain specific models were created, using the previously described 'batch' model processes used to create the updated risk models, to select and weight items that predict recidivism. These modeling procedures were broken-down further by gender. Thus, the procedure selects and weights a unique set of items/responses by gender, outcome, and domain-specific modeling. Combining the assessments created for each domain (8), recidivism type (5), and gender (2), provides for a total of 80 independent models, which form the needs assessment tool.

### *Need Level Categories (NLCs)*

Similar to the development of the risk assessment models, youth's needs scoring was then divided into high, moderate, and low-need categories. Unlike the risk assessment development, NLCs are not hierarchical, where each of the 80 models provides one of three category levels. As the needs assessment models make use of Full Assessment dataset, high-risk categories were set to be roughly two-times the base rate, while low-risk categories were set to be equal-or-less-than the base rate for a given model type. It is anticipated that the NLCs provided for youth will assist in determining programming needs and eligibility.

## **RESULTS**

As outlined in the analytic plan, findings are organized accordingly and presented in this section. First, we present findings from the Prescreen prediction modeling efforts. Next, we describe PCA findings. Full Assessment risk prediction model results are presented next. Updated RLCs, using the Prescreen and Full Assessment results are then presented. Next, EFA and CFA results are presented, followed by need models results. Finally, a discussion of NLC category findings are provided.

### **Prescreen Risk Prediction Models**

Based on SME discussion, the recalibration of the Prescreen tool was needed for two reasons. First, an improvement in the predictive accuracy was anticipated via item weighting. Second, through item selection, removing non-predictive items reduces assessment labor demands. Using the methods described in the analytic plan, a final male and a female model was created. Findings are presented in Table 2. Items and

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<sup>7</sup> The general guidelines and industry rules for these model indices are RMSEA < .10 = Marginal Fit, RMSEA < .08 = Acceptable, RMSEA < .05 = Close fit; SRMR < .08 = Acceptable fit, SRMR < .05 = Good fit; CFI/TLI > .90 = Acceptable fit, CFI/TLI > .95 = Good fit (Brown, 2014, Wang & Wang, 2012; Little, 2013).

responses are listed in the first column, while male and female columns identify the weights assigned to each response; blank cells indicate that an item does not score for a particular model. Responses that provide an increased risk to recidivate are positive values and those that are protective are negative values (reduce recidivism risk). Where indicated within the manual, risk and protective responses were retained. If manual revealed no score, prior research and preliminary analyses were used to determine the value/direction of a given response/item.

Overall findings reveal that most items used as part of the current PACT are found to be predictive of recidivism. However, there are some items that do not score and will be outlined for removal from the Prescreen. These items include sexual misconduct misdemeanor referrals, felony sex offense referrals, history of abuse, and history of mental health problems. In addition, there are several items that are gathered as part of the Prescreen tool and do not currently score, in which we identified as predictive. These additional scoring items include history of anti-social friends/companions, history of jail/imprisonment of persons who were ever involved in the household, problem history of parents who are currently involved with the household, history of alcohol use, and history of drug use. Examining the final model weights, age of first offense is one of the strongest predictors for both males and females, while current friends/companions is a stronger predictor for males and against-person felony referrals tend to be a stronger predictor for females.

**Table 2. Pre-Screen Risk Models**

<b>Measure</b>	<b>Male</b>	<b>Female</b>
	Any	Any
Gender		
Female	NA	NA
Male	NA	NA
<b>CRIMINAL HISTORY</b>		
Age at first offense		
Over 16	0	0
16	3	4
15	6	8
13 to 14	9	12
Under 13	12	16
Misdemeanor referrals		
None or one	0	0
Two	2	2
Three or four	4	4
Five or more	6	6
Felony referrals:		
None	0	0
One	4	4
Two	6	6
Three or more	8	8
Weapon referrals		
None	0	0
One or more	1	1
Against-person misdemeanor referrals		
None	0	0
One	1	2
Two or more	2	4
Against-person felony referrals		
None	0	0
One or two	2	4

Three or more	4	8
Sexual misconduct misdemeanor referrals*	--	--
Felony sex offense referrals*	--	--
Disposition orders where youth served at least one day confined in detention		
None	0	0
One	2	3
Two	4	6
Three or more	6	9
Disposition orders where youth served at least one day confined JRA		
None	0	0
One	2	3
Two or more	4	6
Escapes		
None	0	0
One	1	1
Two or more	2	2
Failure-to-appear in court warrants		
None	0	0
One	2	2
Two or more	4	4
<b>SOCIAL HISTORY</b>		
School		
None of the following	0	0
Enrolled and: Problems reported by teachers or calls to parents, or some full-day unexcused absences, or mostly Cs and Ds, some Fs	2	2
Dropped out, expelled or suspended, or enrolled and: calls to police, or truancy petition or equivalent, or some Ds and mostly Fs.	4	4
History of anti-social friends/companions		
Never had consistent friends or companions	0	
Had pro-social friends	-1	
Had anti-social friends	1	
Been a gang member/associate	2	
Current friends/companions		
Has pro-social friends and no anti-social friends	-5	-4
Has no friends, or pro-social and anti-social friends	0	0
Has all anti-social friends	5	4
Is gang member/associate	10	8
History of Out-of-Home and Shelter Care Placements Exceeding 30 Days		
No out-of-home placements exceeding 30 days	0	0
One or more out-of-home placements	2	2
History of Runaways or Times Kicked Out of Home		
No history of running away/being kicked out	0	0
One instance of running away/kicked out	4	3
Two or more instances of running away/kicked out	8	6

History of jail/imprisonment of persons who were ever involved in the household for at least three months		
No sibling(s),mother, father jail/imprisonment	0	0
Sibling(s),mother or father jail/imprisonment	4	2
Jail/Imprisonment History if currently involved in the household		
No sibling(s),mother, father jail/imprisonment	0	0
Sibling(s),mother or father jail/imprisonment	1	1
Problem history of parents who are currently involved with the household		
No problem history of parents in household		0
Any Parental problem		1
Parental authority and control		
Youth usually obeys and follows rules	0	0
Sometimes obeys or obeys some rules	4	3
Consistently disobeys, and/or is hostile	8	6
History of alcohol use		
No past alcohol use	0	0
Past alcohol use	2	2
Past use caused one or more problems	4	4
History of drug use		
No past drug use	0	0
Past drug use	1	1
Past use caused one or more problems	2	2
Current alcohol/drug use		
Current alcohol/drugs not causing family conflict, disrupting education, causing health problems, interfering with keeping pro-social friends or contributing to criminal behavior	0	0
Current alcohol/drugs causing family conflict, or disrupting education, or causing health problems, or interfering with keeping pro-social friends or contributing to criminal behavior	1	2
History of Abuse*	--	--
History of Being a Victim of Neglect		
Not victim of neglect	0	0
Victim of neglect	1	1
History of Mental Health Problems*	--	--

Note: \*Item does not score.

AUC values of the updated models and those based on the current Prescreen scoring are provided in Table 3. As a reference, the AUC values from Barnoski's 2004 PACT study are also provided. Findings indicate that the updated models improve predictive accuracy over the current Prescreen model scoring by two percent. While this only represents a small improvement, readers should take note of the AUC ranges (presented previously). The difference between a weak and a strong AUC value is roughly eight percent, and the identified two percent improvement notably pushes the predictive accuracy of both models from 'moderate' to 'strong'. It is also worth noting that the Barnoski (2004) study identified a substantially reduced AUC when compared to current and updated Prescreen models. These improvements may be due to updated practices that were implemented in 2005 and/or aggregate population changes (i.e. decreasing crime rates for juveniles or alterations in overall risk).

**Table 3. Pre-Screen Modeling Results**

	Male	Female	Gender-Neutral
<b>AUC</b>			
Barnoski 2004 AUC			0.64
Current Prescreen AUC	0.69	0.70	0.69
New Model AUC	0.71	0.72	0.71
<b>BASE RATES</b>			
Barnoski (2004) gender-neutral base rate			50%
Current gender-neutral base rate			34%

*Principle Component Analysis (PCA)*

Prior to creating the Full Assessment models, PCA analysis was completed to identify items that could be used as scales in the batch model procedure. Scale creation is an important process, as it allows items with similar content to ‘work as a team’, analogous to a single reed being less stable/easier to break than a bundle. This analysis was completed with the subset of youth who completed the Full Assessment. The detailed statistical results of the PCA are found in Appendix III. While not all scales (or components) identified in the PCA were found to be predictive in the risk models, many scales provided the underlying evidence that allowed for the variable combinations used in the scales presented.

**Full PACT Risk Prediction Models**

Using the reduced sample of youth that received the Full Assessment, we proceeded to create the 10 risk models previously outlined. Again, using the methods described in the analytic plan, male and female models were created. Detailed model findings are presented in Appendix IV. Items and responses are listed in the first column. Male and female columns identify the weights assigned to each response, where blank cells indicate that an item does not score for a particular model/gender. Due to the additional outcomes modeled, there are five male and five female columns. Items are listed with their original item numbers and within domain; however, due to scale creation, items are often not in their original order. Readers should note that item number listed with a ‘h’ are those from the manual’s ‘history’ section or ‘c’ for the ‘current’ section of each domain. Items identified as a scale have a subtitle row and are highlighted as a group. ‘Select all that apply’ times are indicated and allow for multiple scores/responses within a single item, while all other items a youth may only receive one score/provide one response.

Similar to the Prescreen models, consistency in items selection and weighting is observed between genders, where a given item selected for a female model is more-often-than-not observed to predict for males as well. Greater variations can be observed with regard to model type, where specific items/responses are more predictive of specific types of recidivism. While unique item selection was observed for all model types, the Violent models for both males and females provided the most unique selection of items (and lack of item selection). This finding suggests that if all models cannot be retained for implementation, that the violence model should be given the greatest consideration for retention.

AUC values of the updated models and those based on the current Prescreen scoring are provided in Table 4. Findings indicate that the updated models improve predictive accuracy over the current Prescreen scoring. This finding is universal across all 10 models. Before describing the findings further, readers should note the reduction in AUC values for the current and updated models as compared to the Prescreen models previously presented. The noted AUC shrinkage is *not* a result of reduced predictive accuracy provided by the Full Assessment (in fact the opposite is true). The AUC shrinkage is due to the greater homogeneity (similar range of risk) and reduced sample size available for Full PACT assessment. Stated differently, if all low-risk youth had been provided the Full Assessment, the AUC’s of both the current and updated AUCs would likely exceed the presented values and those of the Prescreen model.

**Table 4. Full Assessment Modeling Results**

	Male					Female				
	Any	Felony	Violent	Property	Drug	Any	Felony	Violent	Property	Drug
<b>MODEL</b>										
<b>AUC</b>	0.67	0.68	0.67	0.66	0.65	0.64	0.67	0.70	0.64	0.67
<b>CURRENT</b>										
<b>AUC</b>	0.63	0.64	0.62	0.60	0.57	0.60	0.60	0.64	0.59	0.57
<b>BASE</b>										
<b>RATE</b>	34%	16%	14%	19%	5%	34%	16%	14%	19%	5%

Given this clarification, our findings indicate a four percent increase in AUC values for both male and female ‘any’ recidivism models. On average, a near 6% improvement is observed when comparing the current PACT scoring to the updated predictions using the Full Assessment. The largest AUC improvement was identified for both male and female Drug models (8 and 10%, respectively). Again, keeping in mind the industry standard AUC ranges, the value increase needed to move from one strength range to the next is roughly 7%. With an average predictive accuracy increase of 6%, our findings represent a substantial improvement over the current PACT scoring.

### **Risk Level Categories (RLCs)**

Cut points were next created, placing youth into an RLC. As indicted, high-risk categories were identified for each model in reference to the base rate (see Table 1). Although the risk scores were created with separate gender samples and with a subset of youth that received the Full Assessment, base rates were those indicated in the larger Prescreen and using a gender-neutral sample. RLC results are provided in Table 5, where the first column provides the updated RLCs and the second column indicates the proportion of youth exceeding a model cut point. Readers should note that high-risk categories are established via the Full Assessment, while the low-risk category combines those below the established cut points for both the Prescreen and Full Assessment. Furthermore, youth may exceed more than one cut point. As a result, the categories are not mutually exclusive and sum to 177%. Moreover, percentages are not provided for the Moderate or High-Diverse groups, as these RLCs are not populated via one of the five outcome models and are instead created via the category assignment rules previously described.

When examining the proportion of youth that exceed the high-risk cut points, the percentages increase from High-Felony (23%) to High-Drug (34%). The relatively similar proportions of youth exceeding the high risk categories indicates a substantial proportion of overlap between categories, with lower levels of high risk categories possessing unique cases not identified within the higher RLCs.

#### *Hierarchical Risk Level Classification (RLC)*

Based on the RLC assignment rules, the ‘Hierarchical Pop%’ category was created. For this column, youth that are indicated to exceed more than one high-risk category are placed at their highest level indicated. Youth exceeding all high-risk cut points are placed in ‘Level 6 – High Diverse’, while those not classified via the low or high-risk models are identified as ‘Level 1 – Moderate’.

What is notable is that nearly half the population is identified as ‘Level 0 – Low Risk’, followed by 22% indicated as ‘Level 1 Moderate’ (22%). The remaining 31% of the population are identified as some form of high-risk, with 15% exceeding all high-risk cut points (i.e. Level 6 – High Diverse). Due to the overlap among High-Diverse cases, only a small proportion of youth are uniquely identified as High-Felony (4%), High-Violent (3%), High-Property (4%), and High-Drug (5%).

Next, we examined the type and proportion of recidivism for each RLC. Notably, the ‘Level 6 – High Diverse’ group possessed the highest rate of ‘any’ (65%), violent (30%), property (39%), and drug (11%) recidivism, indicating an appropriate classification of a higher risk category of youth that appear to be

opportunistic with regard to future delinquency. Youth indicated as ‘Level 5 – High Felony’ reported the greatest proportion of felony recidivism (26%), while each of the High-Violent (28%), High-Property (32%), and High-Drug (11%) groups possessed similar, or slightly reduced, proportions of their specific type of recidivism, as compared to High-Diverse. These findings provide evidence that recidivism specialization occurs among the WAJCA probation population and specified RLC categories can be established using outcome-specific PACT models.

**Table 5. Hierarchical RLC Proportions and Recidivism**

<b>Updated RLC</b>	<b>Pop% Exceeding Cut Point*</b>	<b>Hierarchical Pop%</b>	<b>Any Recid%</b>	<b>Felony Recid%</b>	<b>Violent Recid%</b>	<b>Property Recid%</b>	<b>Drug Recid%</b>
Level 6 - High Diverse	--	15	<b>65</b>	22	<b>30</b>	<b>39</b>	<b>11</b>
Level 5 - High Felony	23	4	59	<b>26</b>	19	31	10
Level 4 - High Violent	28	3	53	22	<b>28</b>	28	6
Level 3 - High Property	29	4	53	20	16	<b>32</b>	8
Level 2 - High Drug	34	5	51	19	16	26	<b>11</b>
Level 1 - Moderate	--	22	41	13	13	20	5
Level 0 - Low	<b>47</b>	<b>47</b>	18	4	6	9	3

\*Note – Youth may exceed more than one cut point, therefore the column does not indicate mutually exclusive category membership.

We further examined the RLC proportions; all high-risk youth were grouped into a single category and compared to the current PACT RLCs, as well as those initially created and examined by Barnoski (2004)<sup>8</sup>. Improved prediction is identified if updated high-risk categories have a greater proportion of recidivism indicated and a reduced proportion for low-risk categories. The findings are presented in Table 6. Several positive findings are identified via the updated RLCs. First, the population proportions are relatively similar when compared to the current RLCs. While low-risk proportions are equal (47%), the high-risk proportions were found to be higher for the updated RLCs (32%) compared to the current RLCs (28%). While RLCs can be further adjusted to meet agency need, by placing relatively equal proportions of youth in RLC categories, as compared to the current PACT, this may remove concerns of supervision labor modifications following implementation.

With regard to recidivism rates, the updated RLCs provide improved prediction. Specifically, the updated RLCs indicate a 6% improved prediction of ‘any’ recidivism for the high-risk category, compared to the current RLCs (61% vs. 55%). Furthermore, with the exception of high-risk property recidivism (34%), the updated high and low-risk categories provided improved prediction of specified outcome types when compared to the current RLCs. When compared to the Barnoski (2004) findings, the proportion of high-risk youth was greater, while low-risk proportions were reduced. With that said, the updated RLCs provide a similar rate of ‘any’ recidivism prediction. Given the higher base rates of recidivism during the time the Barnoski study data was collected, it is notable that the updated RLCs are achieving a similar rate of recidivism prediction.

<sup>8</sup> Readers should note that Barnoski (2004) did not report property and drug recidivism rates; thus, these are not indicated in the table

Table 6. Three Category RLC Comparison

RLC	Pop%	Any Recid%	Felony Recid%	Violent Recid%	Property Recid%	Drug Recid%
<b>Updated RLC</b>						
<i>High</i>	32	<b>61</b>	<b>27</b>	<b>26</b>	<b>34</b>	<b>10</b>
<i>Moderate</i>	22	41	14	13	20	5
<i>Low</i>	<b>47</b>	19	4	5	9	3
<b>Current RLC</b>						
<i>High</i>	28	<b>55</b>	<b>25</b>	<b>25</b>	<b>34</b>	<b>8</b>
<i>Moderate</i>	25	37	12	14	21	6
<i>Low</i>	<b>47</b>	20	5	6	10	3
<b>Barnoski 2004</b>						
<i>High</i>	<b>43</b>	<b>61</b>	<b>32</b>	<b>11</b>	--	--
<i>Moderate</i>	28	48	21	6	--	--
<i>Low</i>	29	34	11	3	--	--

## Needs Assessment

The needs assessment analyses consisted of three stages. First, using the Full Assessment sample of youth, factor analyses were completed to identify domain scales consisting of item combinations. The created scales and items were then modeled for their criminogenic properties (ability to predict recidivism). Each domain provides its own set of needs models. Finally, cut points for needs models were established.

### *Factor Analysis*

First, an EFA was completed. The purpose of this analysis is to seek out item combinations and form initial scales. This method also provides researchers with the ability to identify *convergent/divergent validity* (Brown, 2014; Mei, 2018), essentially measuring the strength of variable combinations within a scale, as well as the weakness of variable relationships between two different scales. Several industry-standard statistical indices were computed to test the fit and strength of the models' reliability and validity, including associated rules to evaluate the strength of the IRT/IFA models, the Kaiser-Guttman rule, goodness of fit, Cronbach's alpha, and the strength of the loading/cross-loadings. Once the EFA was completed, and convergent/divergent validity was identified, CFA analyses were completed. The goal of CFA was to confirm the existence of the scales identified in the EFA analysis. The CFI, TLI, and RMSEA<sup>9</sup> were also computed to assess model fit and strength. Collectively, these tests were used to confirm the *construct validity* of the developed scales. The completion of the EFA and CFA procedures resulted in the determination of construct validity for our developed set of PACT needs scales. These findings are numerous and nearly represent a technical report in their own right. Readers interested in the details of these analyses should refer to Appendix V.

The totality of findings revealed six larger needs domains, several of which provide additional scales and sub-scales. This is a reduction from the previously identified 10 scales, based on current, original/theoretical domains previously outlined. While many domains remained nearly identical, several were combined to form larger scales and many possess additional content forming subscales. We feel the new

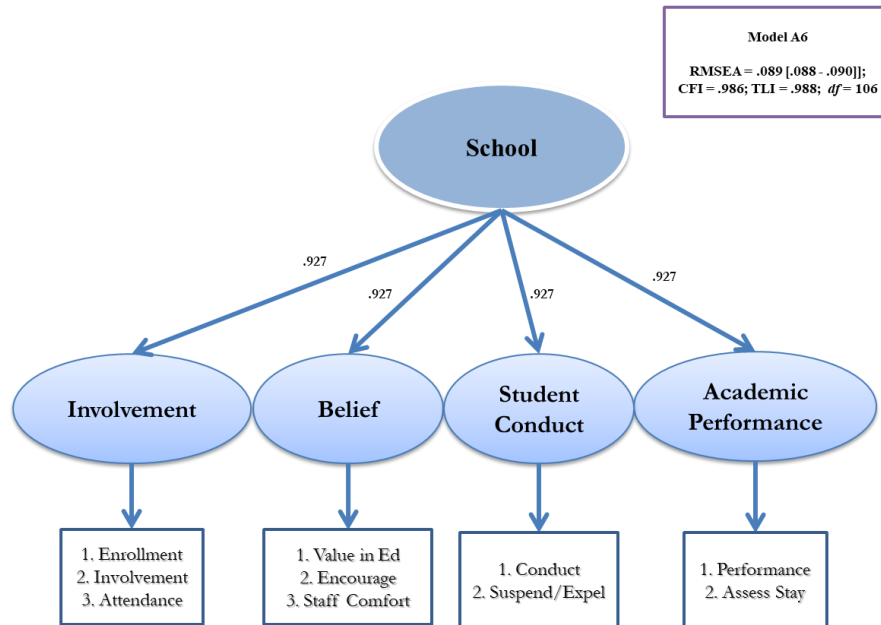
<sup>9</sup> The general guidelines and industry rules for these model indices are RMSEA < .10 = Marginal Fit, RMSEA < .08 = Acceptable, RMSEA < .05 = Close fit; SRMR < .08 = Acceptable fit, SRMR < .05 = Good fit; CFI/TLI > .90 = Acceptable fit, CFI/TLI > .95 = Good fit (Brown, 2014, Wang & Wang, 2012; Little, 2013).



organization of domains provides greater contextual details of youth needs as well as more translatable eligibility criteria for programming.

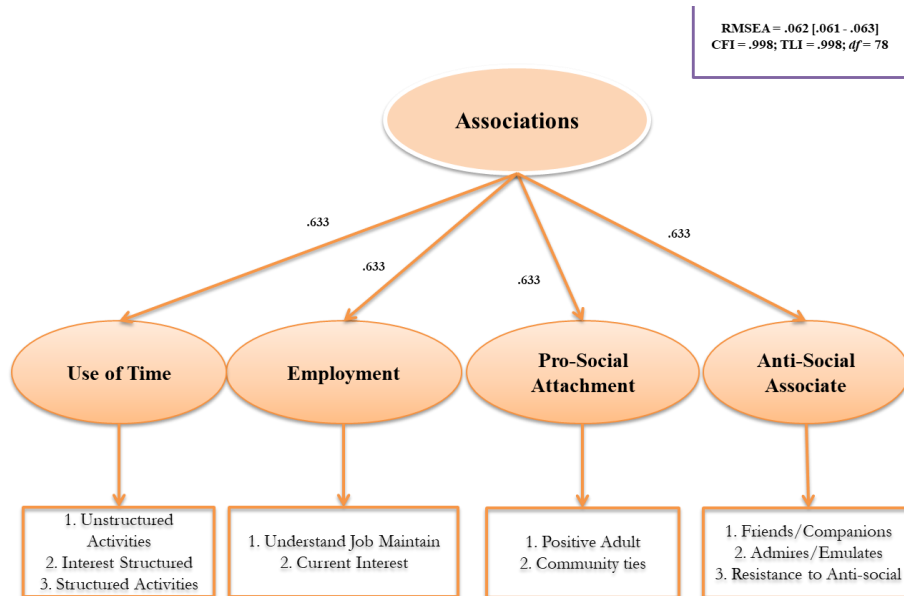
For the purposes of this technical report, we provide a brief discussion of the items used to create the scales and updated domains. With regard to the School Needs, four scales were identified via factor analysis – Involvement, Belief, Student Conduct, and Academic Performance. All subscale loadings are strong (.927), and model fit indices exceed industry standards (RMSEA = .089; CFI/TLI = .988). While similar to the current domain, the School subscales provide added context intended to assist with case management.

**Figure 4. School Needs**



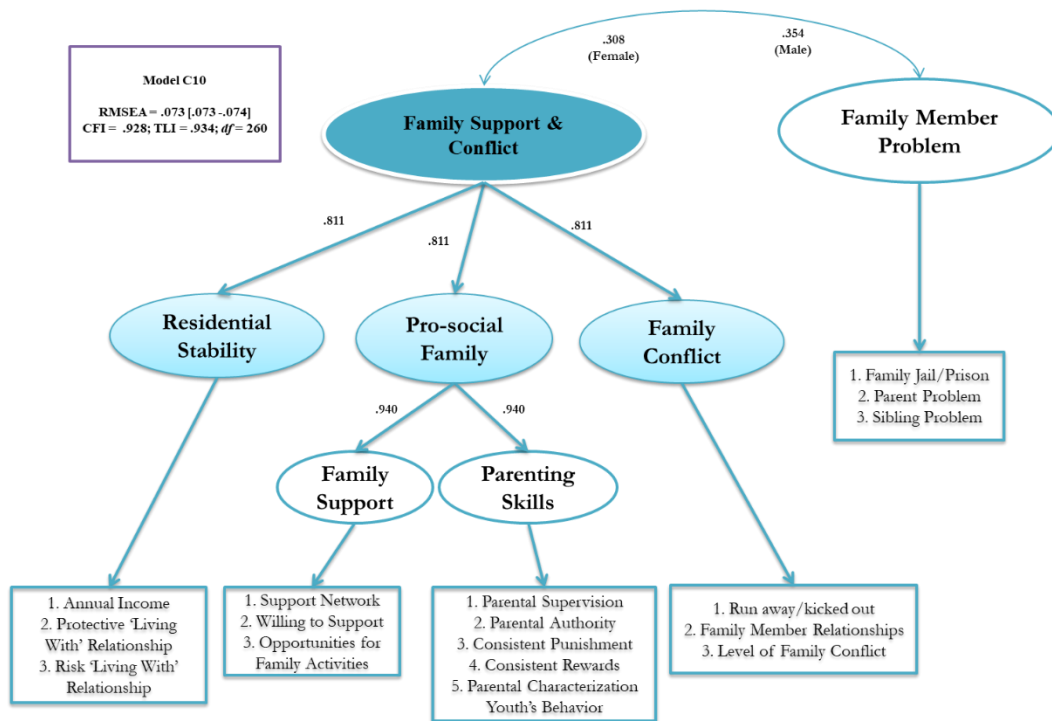
The Associations Domain was established through a combination of three of the original domains – Current Use of Free Time, Current Employment, and Current Relationships. Four subscales were identified via factor analysis – Use of Free Time, Employment, Pro-Social Attachment, and Anti-Social Attachment. All subscale loadings are good (.633) and model fit indices exceed industry standards (RMSEA = .062; CFI/TLI = .998). Unlike the School domain, the combination of current PACT domains provides a strengthening of the youth needs scale context, in what was once three small but related domains. In particular, programming and interventions are often difficult when only observing risk and protective factors of a single domain (i.e. Employment vs. Free Time) without simultaneously understanding the issues/strengths of related domains. The new, combined domain provides an opportunity to assess the companions and extra-curricular activities of the youth in a single scale.

**Figure 5. Association Needs**



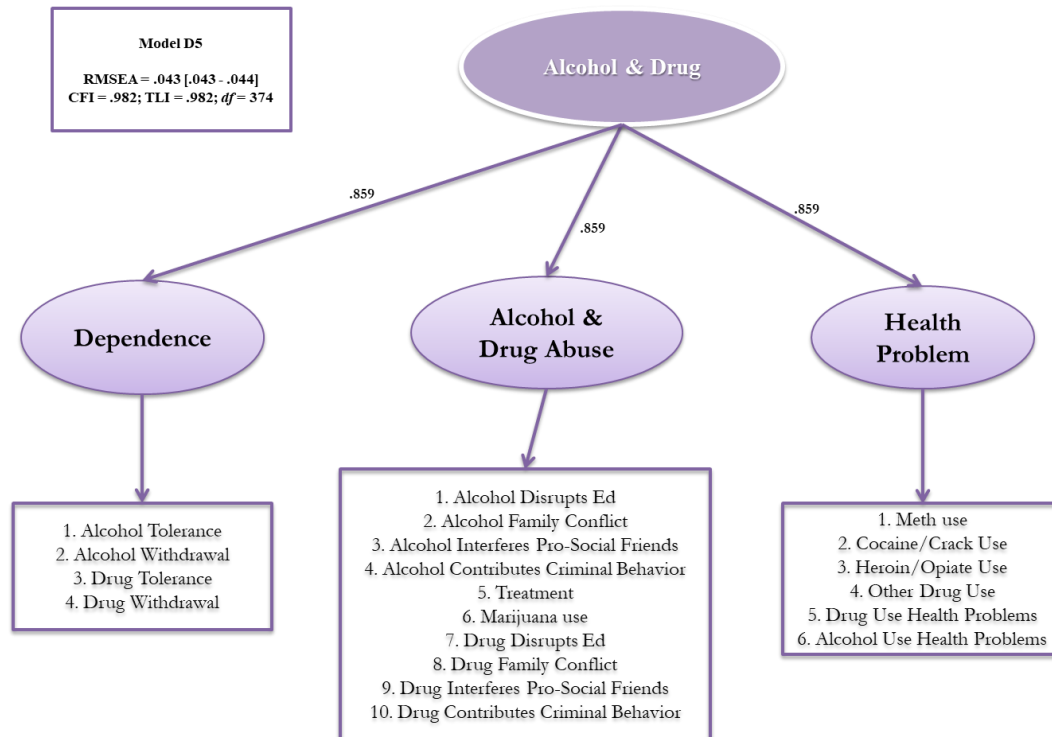
With regard to the Family domain, the items similar and related to the current PACT but the updated domain provides a more complex understanding of family relationships. The first notable difference is the bifurcation of the domain into two scales – Family Member Problem and Family Member Support & Conflict. Family Member Problem is a single scale, identifying issues in the youth’s family members’ life (e.g. jail, mental health and substance abuse issues) that are, largely, not within the youth’s control. Within the Family Member Support & Conflict scale, three subscales are identified – Residential Stability, Pro-social Family, and Family Conflict. Furthermore, within the Pro-social Family scale, two additional subscales exist – Family Support and Parenting Skills. Scale loadings range from small (.308) to strong (.940). Model fit indices exceed industry standards (RMSEA = .073; CFI=.928; TLI = .934). While family counseling and related programming (e.g. FFT) have commonly been utilized for youth with high-needs within the Family domain, this new scale development may provide a contextual understanding that will assist and target programming needs of youth.

Figure 6. Family Needs



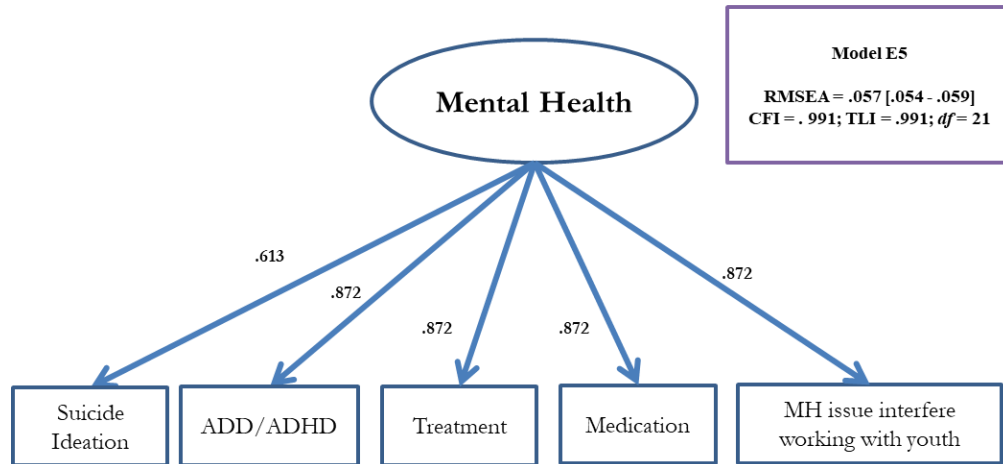
The Alcohol and Drug domain is relatively similar in context to the original scale. However, a factor analysis identified and confirmed three subscales – Dependence, Alcohol and Drug Abuse, and Health Problems. All subscale loadings are strong (.859), and model fit indices exceed industry standards (RMSEA = .043; CFI/TLI = .992). While similar to the current domain, the new domain provides separate scales that outline the severity of youth substance abuse issues and scales related to the impact of use/abuse as well as substances and symptoms of related health concerns.

**Figure 7. Alcohol & Drug Needs**



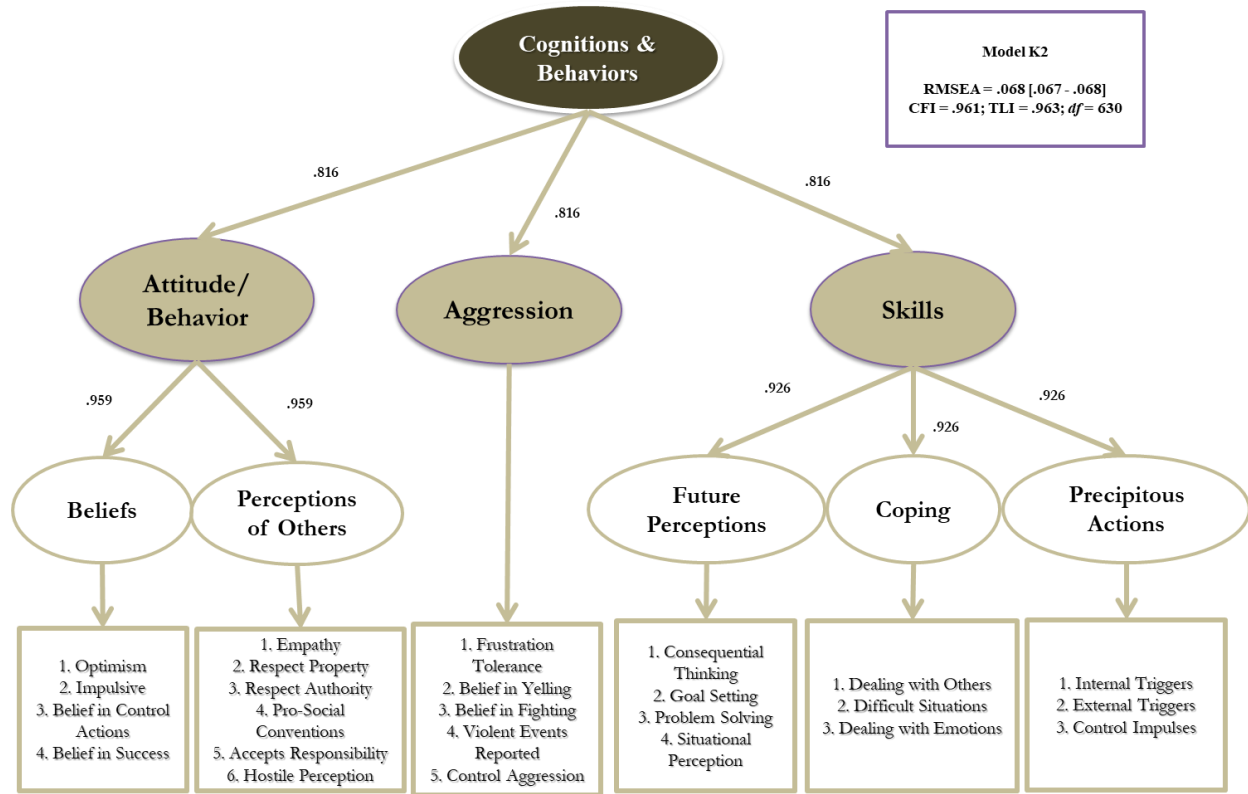
The Mental Health domain is another collective of items that is relatively similar in context to the original scale. There is only one scale identified and no subscales indicated. Five items compose the scale, including suicide ideation, ADD/ADHD, treatment, medication, and mental health issues interfering with working with a youth. The scale loadings range from moderate-to-strong (.613-.872) and model fit indices exceed industry standards (RMSEA = .057; CFI/TLI = .991). Based on SME input, this domain, by comparison to others, represents a difficult domain to program. The updated scale construction does not offer a change to the current utility of the domain but does restructure and combine scale items to *flag* youth in need of additional, clinical assessment.

**Figure 8. Mental Health Needs**



One of the most interesting newly organized domains, Cognitions & Behaviors, was established through a combination of three of the original Pactdomains – Attitudes/Behaviors, Aggression, and Skills. Within the Attitudes scale, two subscales are identified – Beliefs and Perceptions of Others. The Aggression scale is a collection of five items, with no subscales. Finally, within the Skills scale, three subscales are identified – Future Perceptions, Coping, and Precipitous Actions. All subscale loadings are in the ‘strong’ range (.816-.959), and model fit indices exceed industry standards (RMSEA = .068; CFI = .961 TLI = .963). Unlike the Associations domain, this new scale organization of domains represents a combination of three domains that were strongly predictive on their own. While the findings provide a strong culmination of item relationships, previously scored separately, theory and prior findings support the combination (Dodge, 1980; Dodge, Pettit, McClaskey, & Brown, 1986; Moffitt, 1993). In particular, programming and interventions for aggression (i.e. ART; van der Put et al., 2012) and general cognitive-behavioral therapies (i.e. MRT) often attempt to ameliorate, or reduce, criminal/delinquency thoughts and patterns. We believe this new organization of scales provides a solidified domain that is more amenable and informative of youth cognitive-behavioral programming.

**Figure 9. Cognitions & Behaviors Needs**



### *Criminogenic Needs Models*

Next, we created needs prediction models. The RNR model indicates that needs must have an empirical (statistical) relationship with recidivism (Andrews & Bonta, 2010). Needs that possess such an association are termed *criminogenic*. To create criminogenic needs domains, the scales described in the previous section and remaining (single) dynamic items were modeled using the previously described prediction modeling procedure. A total of 80 criminogenic needs models were developed and validated. However, unlike the risk models, each domain is modeled separately. Detailed model findings are provided in Appendix VI. A thorough review of the items that were found to be predictive, and their response weights, demonstrates that, like the risk models, some items/scales are universally predictive, while others are only predictive for specific types of outcomes, or for one gender.

We further examined the AUC values of the created needs models. Models' AUC findings are provided in Table 7, where the two highest AUC values are bolded for reference<sup>10</sup>. All AUC values range from negligible-to-moderate strength (see Rice & Harris, 2005). For all but the Violent model, the new Associations Needs Domain was found to be one of the most predictive for all outcomes except Violent. Similarly, the Attitudes sub-domain was found to be one of the most predictive models for all but the Drug model. The Alcohol & Drug Domain was found to be the most predictive for both male and female Drug models (.60 & .65, respectively). Similarly, the Aggression sub-domain was found to be most predictive for

<sup>10</sup> Readers should note that Domain 6 (Cognitions& Behaviors) was assessed as three separate scales to highlight the AUC variations for specific outcome models (i.e. Violent). This scale may also be combined to form a single scale where the scores of each of the three domains can be combined to for one scale value.

male and female violent recidivism. It is also notable that while the School, Family and Skills domains/sub-domains are not the top two predictive domains for any of the 10 model types, they still possess small-to-moderate prediction strength for many of the predicted outcome types. However, the Mental Health Needs Domain indicated negligible strength of prediction for nearly all models, suggesting its low utility for predicting future instance of recidivism.

Collectively, these findings indicate the updated domain and needs model scoring, consisting of only dynamic items, provides criminogenic prediction for youth receiving the Full Assessment. Further, recidivism outcome types are better predicted by some domains than others. The ranking of domains is considered to be a benefit of the updated models, allowing case managers to prioritize programming and intervention provision that will have the greatest impact for a given type of youth.

**Table 7. Needs Model Domain AUC Values**

Domain	Male					Female				
	<i>Any</i>	<i>Felony</i>	<i>Violent</i>	<i>Property</i>	<i>Drug</i>	<i>Any</i>	<i>Felony</i>	<i>Violent</i>	<i>Property</i>	<i>Drug</i>
<b>School</b>	0.60	0.59	0.60	0.58	0.57	0.57	0.60	0.58	0.56	0.57
<b>Associations</b>	<b>0.62</b>	<b>0.63</b>	0.60	<b>0.60</b>	<b>0.60</b>	<b>0.60</b>	<b>0.62</b>	0.57	<b>0.59</b>	<b>0.59</b>
<b>Family</b>	0.59	0.57	0.59	0.58	0.55	0.56	0.56	0.59	0.54	0.57
<b>Alcohol &amp; Drug</b>	0.57	0.56	0.52	0.55	<b>0.60</b>	0.56	0.57	0.52	0.53	<b>0.65</b>
<b>Mental Health</b>	0.50	0.50	0.54	0.52	0.50	0.50	0.53	0.56	0.51	0.51
<b>Cognitions &amp; Behaviors</b>										
<i>Attitudes</i>	<b>0.60</b>	<b>0.60</b>	<b>0.61</b>	<b>0.60</b>	0.56	<b>0.59</b>	<b>0.61</b>	<b>0.64</b>	<b>0.59</b>	0.58
<i>Aggression</i>	0.58	0.57	<b>0.63</b>	0.57	0.52	0.57	0.57	<b>0.64</b>	0.56	0.51
<i>Skills</i>	0.55	0.55	0.57	0.57	0.53	0.56	0.57	0.60	0.57	0.52

#### *Needs Level Categories (NLCs)*

Our final set of analyses divided youth into NLCs. It is anticipated that these NLCs will be utilized for program eligibility as well as prioritization of intervention assignment. Similar to RLCs, high-need cut points were established to be roughly twice the base rate. However, unlike the RLCs, the NLCs required the establishment of low and moderate-risk groups for all 80 needs models. Because it is uncommon for low-risk youth to receive the Full Assessment and hence, the provided needs assessment items, the low-need cut point was roughly set at the base rate. Table 8 provides the NLC category proportions<sup>11</sup>.

Similar to the risk models, the NLC proportions indicate most male youth identify as moderate-need, while most female youth identifying low-need. The exception to this is found in the Mental Health Domain, where most youth are identified to be of low-need, which is understandable given the domain's weaker prediction strength. It should be noted that SME collaboration and feedback will be needed to further explore both the utility and exact placement of NLC cut points.

<sup>11</sup> Again, detailed findings of the cut point values and NLC recidivism rates can be found in Appendix VI.

**Table 8. Needs Level Category (NLC) Proportions**

Domain	Male					Female				
	<i>Any</i>	<i>Felony</i>	<i>Violent</i>	<i>Property</i>	<i>Drug</i>	<i>Any</i>	<i>Felony</i>	<i>Violent</i>	<i>Property</i>	<i>Drug</i>
<b>School</b>										
<i>Low%</i>	16	28	17	19	18	24	41	68	64	20
<i>Moderate%</i>	55	53	54	67	48	67	41	26	30	65
<i>High%</i>	29	19	28	14	34	8	18	6	6	16
<b>Associations</b>										
<i>Low%</i>	19	44	23	33	19	24	48	54	14	34
<i>Moderate%</i>	59	22	49	43	69	71	45	41	72	61
<i>High%</i>	22	33	27	25	12	5	8	5	14	5
<b>Family</b>										
<i>Low%</i>	11	20	16	21	11	21	44	54	41	41
<i>Moderate%</i>	69	59	55	59	65	69	54	42	55	49
<i>High%</i>	20	21	29	20	24	10	2	4	4	10
<b>Alcohol &amp; Drug</b>										
<i>Low%</i>	29	36	36	36	36	35	42	65	64	64
<i>Moderate%</i>	51	52	56	47	42	54	52	34	30	24
<i>High%</i>	20	11	8	16	22	10	6	1	6	12
<b>Mental Health</b>										
<i>Low%</i>	68	68	68	68	68	61	61	61	61	61
<i>Moderate%</i>	25	28	25	28	31	33	33	27	33	33
<i>High%</i>	7	3	7	3	1	6	6	12	6	6
<b>Cognitions &amp; Behaviors</b>										
<b><i>Attitudes</i></b>										
<i>Low%</i>	6	26	11	23	5	35	54	32	67	28
<i>Moderate%</i>	66	45	65	57	70	52	43	63	24	57
<i>High%</i>	28	28	24	20	25	13	3	5	9	15
<b><i>Aggression</i></b>										
<i>Low%</i>	28	14	28	14	8	24	24	23	24	18
<i>Moderate%</i>	60	74	50	83	89	73	62	57	73	78
<i>High%</i>	12	12	22	3	3	3	14	20	4	4
<b><i>Skills</i></b>										
<i>Low%</i>	14	34	23	23	23	32	35	35	35	35
<i>Moderate%</i>	73	56	66	63	59	58	90	55	52	48
<i>High%</i>	13	10	11	14	18	10	5	9	12	16

## CONCLUSION

This technical report describes the background, design, analyses and findings used to complete Deliverable 1. Much of the work completed was originally proposed following our 2015 report, which outlined the potential for updated risk prediction models. The analyses completed established risk assessment models again, this time with greater SME involvement in their development and design. The analytic plan was further extended, creating a hierarchical set of RLCs, establishing construct validity of new needs domains, developing criminogenic needs models, and setting NLCs for each model.

While further SME input is needed to finalize the assessment tools created, the presented findings represent a culmination of work developed to improve prediction of recidivism and assist with case



management. The new design of the instrument adds complexity in an effort to provide more detailed information to case managers and, in turn, improve youth outcomes. First, both the Prescreen and Full Assessment are now outlined to predict recidivism and quantify youth risk. Prescreen models were created to improve the accuracy of prediction, reduce the number of items, and improve the accuracy of prediction. The Full Assessment is also used to identify low-risk youth, providing a second mechanism for diversion. In addition, the Full Assessment can now not only predict recidivism more accurately but also identify the type of recidivism youth are most likely to commit, which have also been specified to be gender responsive.

Needs assessment models are designed to work with the findings of the risk assessment, identifying the needs that correspond to the youth's most likely recidivism type. Our analyses began with a reorganization of needs domains, developing a reduced number of domains via the combination of items into scales and sub-scales. These new domains were found to possess construct validity allowing scales and items to then be modeled for their ability to predict recidivism. Our findings revealed gender specific predictive validity of the new needs domains for 'any' as well as violent, felony, property and drug recidivism. NLCs were then set to determine program eligibility and prioritization.

While substantial work has been completed to meet the objectives of needs assessment, these analyses represent the first deliverable. Over the next six months, additional work will be completed to explore the use of a typology and other mechanisms for providing optimal matches of youth needs to programming. Unfortunately, Deliverable 2 requires the collection of treatment and programming data, some of which (substance abuse & mental health) is collected via the Department of Social and Health Services (DSHS). This additional data is in the process of being gathered.

## **Recommendations and Considerations**

While much of the initial work for Deliverable 1 has been completed, prior to implementation, additional processes need to be completed and are recommended to continue. In particular, the SME group assembled is still in the process of vetting the tools created. This group must consider how these new tools will impact current policies and practices. For instance, the proposed changes provide an additional mechanism for diverting low-risk youth, potentially changing the proportions of current RLCs and NLCs. These proposed changes also establish a filtering process to connect youth risk with needs and provide a new organization of needs domains. Each one of these changes, while outlined to improve tool performance and youth outcomes, will impact supervision and case management practices. It is therefore recommended that the SME group continue to work through the results, vetting and modifying findings to optimize performance and utility.

Another issue to be considered is the definition of recidivism. While the current definition, 18-month adjudications, provides an established and consistent metric, other definitions may offer improved prediction. That is, definitions that include charges and/or different durations may change item selection, weighting, and predictive accuracy. Additional exploration and analysis would be needed to identify a potentially improved definition of recidivism.

When assessing risk and setting RLCs, base rates and Full PACT Assessments are used to classify high-risk. For the current analysis, this was completed for the WAJCA supervised youth. While a substantial sample was gathered to complete the current analyses, additional justice-involved youth are assessed via Juvenile Rehabilitation (JR). Merging JR with WAJCA data could prove beneficial, setting RLC and NLC cut points referencing the State of Washington's base rate, rather than that of a single agency.

An additional model for consideration is one for sex recidivism. Although off-the-shelf juvenile sex offense prediction tools exist, there is a potential to model sex recidivism as an additional outcome using the PACT. This may involve collecting additional, sex offense specific items. Analyses would be needed to assess the ability to predict sex recidivism and results may lead to a better understanding of youth risk, need, and potential sources of programming.

Finally, with any adjustment to eligibility criteria for program matching, a review of current programming should be considered. That is, domains were outlined to flag youth with programming needs and the availability of evidenced-based interventions will ultimately become the next priority for tool development. A program-gap analysis will provide an understanding of how the needs of the WAJCA youth align with available programming. In particular, whether there are evidenced-based interventions available for all domains and sufficient resources to provide interventions to the total population of moderate and high-need youth has yet to be examined. Findings from such an analysis would inform administrators where current resources can be adjusted and make necessary requests for additional programming dollars.

## Appendix I. Prescreen PACT Descriptive Statistics

Item	Coding	Min.	Max.	Total (n = 64,746)			Males (n = 48,560)			Females (n = 16,186)		
				%	Mean	SD	%	Mean	SD	%	Mean	SD
CRIMINAL HISTORY												
Age at first offense		0	4		2.23	1.21		2.24	1.22		2.19	1.18
Over 16	0			11.7			11.9			11.2		
16	1			16.8			16.4			17.6		
15	2			21.2			20.7			22.3		
13 to 14	3			38.0			37.7			38.8		
Under 13	4			12.4			13.3			10.1		
Misdemeanor complaints		0	3		0.59	0.84		0.60	0.85		0.56	0.80
None or one	0			61.0			61.0			61.0		
Two	1			22.1			21.4			23.8		
Three or four	2			13.9			14.3			13.1		
Five or more	3			3.0			3.3			2.2		
Felony complaints		0	6		0.81	1.31		0.96	1.40		0.47	0.99
None	0			66.8			61.5			79.6		
One	2			27.6			31.5			18.1		
Two	4			3.7			4.5			1.7		
Three or more	6			1.9			2.5			0.6		
Weapon complaints		0	1		0.06	0.23		0.08	0.26		0.02	0.14
None	0			94.1			92.5			98.1		
One or more	1			5.9			7.5			1.9		
Against-person misdemeanor complaints		0	2		0.40	0.63		0.38	0.62		0.45	0.65
None	0			67.5			69.1			63.8		
One	1			24.9			23.7			27.7		
Two or more	2			7.6			7.2			8.5		
Against-person felony complaints		0	4		0.25	0.68		0.30	0.73		0.15	0.53
None	0			87.7			85.5			92.9		
One or two	2			12.0			14.1			7.0		
Three or more	4			0.3			0.4			0.1		
Number of times served at least 24hrs in detention		0	3		0.53	0.85		0.57	0.87		0.45	0.79
None	0			64.4			62.3			69.3		
One	1			24.1			25.4			21.0		
Two	2			5.6			5.8			5.1		
Three or more	3			6.0			6.5			4.6		
Number of times served at least 24hrs confined under JRA		0	4		0.10	0.51		0.11	0.55		0.05	0.37
None	0			96.1			95.4			97.9		
One	2			2.9			3.5			1.7		
Two or more	4			0.9			1.1			0.4		
Escapes		0	2		0.01	0.10		0.01	0.11		0.01	0.09
None	0			99.2			99.2			99.4		
One	1			0.7			0.7			0.6		
Two or more	2			0.1			0.1			0.1		
Failure to appear in court warrants		0	2		0.23	0.58		0.23	0.57		0.25	0.59

None	0	84.1	84.5	83.2
One	1	8.3	8.1	8.7
Two or more	2	7.6	7.4	8.0
<b>SCHOOL</b>				
School scoring	0	2	0.64	0.88
None of the following	0	63.5	63.0	64.7
Enrolled: Problems reported by teachers or calls to parents, or some full-day unexcused absences, or mostly Cs and Ds, some Fs	1	9.5	9.7	8.8
Enrolled: Calls to police, or truancy petition or equivalent, or some Ds and mostly Fs OR dropped out, expelled or suspended	2	27.1	27.3	26.5
<b>CURRENT FRIENDS/COMPANIONS</b>				
Friends/companions scoring	0	3	1.00	0.84
Has pro-social friends, no anti-social friends	0	27.7	27.3	28.6
Has no friends, or pro-social and anti-social friends	1	53.4	53.0	54.3
Has all anti-social friends	2	10.7	10.5	11.4
Is a gang member/associate	3	8.2	9.3	5.7
<b>HISTORY OF COURT-ORDERED OR DSHS VOLUNTARY OUT-OF-HOME &amp; SHELTER CARE PLACEMENTS EXCEEDING 30 DAYS</b>				
History of court-ordered placements scoring	0	1	0.15	0.35
None	0	85.5	86.7	82.6
One, two or three/more	1	14.5	13.3	17.4
<b>HISTORY OF RUNAWAYS OR TIMES KICKED OUT OF HOME</b>				
History of runaway scoring	0	2	0.55	0.84
No history	0	67.6	71.1	59.1
One instance	1	9.5	9.1	10.6
Two or more instances	2	22.9	19.8	30.2
<b>JAIL/IMPRISONMENT HISTORY</b>				
Jail/imprisonment scoring	0	1	0.43	0.49
No sibling(s), mother, father jail/imprisonment	0	57.2	58.4	54.5
Sibling(s), mother or father jail/imprisonment	1	42.8	41.6	45.5
<b>CURRENT PARENTAL AUTHORITY &amp; CONTROL</b>				
Parental authority and control scoring	0	2	1.14	0.99
Usually obeys	0	43.0	43.7	41.5
Sometimes obeys	1	0.0	0.0	0.0

Disobeys	2	57.0	56.3	58.5							
<b>ALCOHOL &amp; DRUG USE</b>											
Alcohol & drug use scoring	0	2	0.57	0.90	0.59	0.91	0.53	0.88			
Current alcohol/drugs not causing family conflict, disrupting education, causing health problems, interfering with keeping pro-social friends or contributing to criminal behavior	0	71.3	70.3	73.7							
Current alcohol/drugs causing family conflict, or disrupting education, or causing health problems, or interfering with keeping pro-social friends or contributing to criminal behavior	2	28.7	29.7	26.3							
<b>HISTORY OF ABUSE</b>											
History of physical abuse scoring	0	1	0.23	0.42	0.19	0.39	0.32	0.47			
No physical or sexual abuse	0	77.0	80.8	68.0							
Physical or sexual abuse	1	23.0	19.2	32.0							
<b>HISTORY OF BEING A VICTIM OF NEGLECT</b>											
History of being a victim of neglect scoring	0	2	0.28	0.69	0.26	0.67	0.33	0.74			
Not a victim of neglect	-1	86.1	87.1	83.6							
Victim of neglect	1	13.9	12.9	16.4							
<b>HISTORY OF MENTAL HEALTH PROBLEMS</b>											
History of mental health problems scoring	0	1	0.12	0.32	0.10	0.31	0.15	0.35			
No history of mental health problem(s)	0	88.3	89.5	85.5							
Diagnosed with mental health problem(s), only medication prescribed, only treatment prescribed or medication and treatment prescribed	1	11.7	10.5	14.5							

## Appendix II. Full PACT Descriptive Statistics

	Dynamic item (X)	Coding	Total (n = 50,862)			Males (n = 38,100)			Females (n = 12,762)		
Item			Min.	Max.	%	Mean	SD	%	Mean	SD	%
<b>CRIMINAL HISTORY</b>											
Age at first offense			0	4		2.70	1.05		2.71	1.06	
Over 16		0			4.2			4.3			3.9
16		1			10.5			10.4			10.8
15		2			18.5			18.1			19.6
13 to 14		3			45.5			44.5			48.4

Under 13	4			21.4			22.8			17.4		
Misdemeanor complaints		0	3		1.08	1.02		1.08	1.03		1.09	0.97
None or one	0			37.8			38.7			35.0		
Two	1			26.0			25.0			29.1		
Three or four	2			26.2			25.7			27.9		
Five or more	3			9.9			10.6			8.0		
Felony complaints		0	6		1.48	1.69		1.65	1.74		0.96	1.40
None	0			46.9			41.9			61.6		
One	2			37.8			40.1			30.8		
Two	4			10.1			11.7			5.4		
Three or more	6			5.3			6.3			2.2		
Weapon complaints		0	1		0.10	0.30		0.13	0.33		0.04	0.19
None	0			89.6			87.5			96.1		
One or more	1			10.4			12.5			3.9		
Against-person misdemeanor complaints		0	2		0.59	0.75		0.56	0.74		0.68	0.78
None	0			56.9			58.8			51.2		
One	1			27.0			26.2			29.3		
Two or more	2			16.1			15.0			19.5		
Against-person felony complaints		0	4		0.38	0.81		0.42	0.84		0.27	0.71
None	0			81.4			79.7			86.6		
One or two	2			18.1			19.8			13.1		
Three or more	4			0.5			0.5			0.3		
Sexual misconduct misdemeanor complaints		0	2		0.02	0.17		0.03	0.18		0.01	0.11
None	0			97.7			97.5			99.2		
One	1			1.8			2.2			0.6		
Two or more	2			0.3			0.3			0.2		
Felony sex offense referrals		0	2		0.04	0.20		0.05	0.23		0.01	0.08
None	0			96.5			95.5			99.4		
One	1			3.3			4.2			0.5		
Two or more	2			0.3			0.3			0.0		
Number of times served at least 24hrs in detention		0	3		1.41	1.10		1.42	1.10		1.37	1.09
None	0			23.5			23.1			24.7		
One	1			36.5			36.4			36.6		
Two	2			15.6			15.5			16.0		
Three or more	3			24.4			25.0			22.7		
Number of times served at least 24hrs confined under JRA		0	4		0.19	0.71		0.21	0.74		0.14	0.61
None	0			92.3			91.5			94.6		
One	2			5.8			6.4			3.9		
Two or more	4			1.9			2.1			1.5		
Escapes		0	2		0.02	0.13		0.02	0.13		0.02	0.14
None	0			98.5			98.6			98.4		
One	1			1.4			1.3			1.5		
Two or more	2			0.1			0.1			0.1		
Failure to appear in court warrants		0	2		0.53	0.79		0.51	0.78		0.62	0.83
None	0			65.8			67.5			60.7		

One	1			15.1			14.5			16.9	
Two or more	2			19.1			18.0			22.4	
<b>SCHOOL HISTORY</b>											
Special education need		0	1		0.60	0.49		0.56	0.50		0.72 0.45
No need	0			60.2			56.2			72.1	
Need	1			39.8			43.8			27.9	
No special education need		0	1		-0.60	0.49		-0.56	0.50		-0.72 0.45
Need	0			39.9			43.9			28.0	
No need	1			60.1			56.1			72.0	
Learning disability		0	1		0.20	0.40		0.22	0.42		0.14 0.34
No	0			79.9			77.7			86.3	
Yes	1			20.1			22.3			13.7	
Behavioral problem		0	1		0.21	0.40		0.23	0.42		0.14 0.34
No	0			79.3			77.0			86.3	
Yes	1			20.7			23.0			13.7	
Mental retardation		0	1		0.01	0.08		0.01	0.08		0.00 0.07
No	0			99.4			99.3			99.5	
Yes	1			0.6			0.7			0.5	
ADHD		0	1		0.15	0.36		0.18	0.38		0.08 0.28
No	0			84.7			82.4			91.5	
Yes	1			15.3			17.6			8.5	
History of expulsions and suspensions since the first grade		-1	2		1.54	0.96		1.61	0.89		1.33 1.11
None	-1			11.2			9.2			17.0	
One	1			12.6			11.5			16.1	
Two or more	2			76.2			79.3			66.9	
Age at first expulsion or suspension		-1	2		1.49	0.96		1.56	0.89		1.28 1.10
None	-1			11.2			9.2			17.0	
14 to 18	1			18.0			16.8			21.5	
13 or under	2			70.9			74.0			61.5	
Enrolled in a community school during the last 6 months	X		-2	2		-1.51 1.31		-1.52	1.30		-1.47 1.35
Graduated/enrolled	-2			87.7			88.0			86.9	
Not enrolled	2			12.3			12.0			13.1	
<b>CURRENT SCHOOL STATUS</b>											
Current school enrollment status	X		-2	3		-1.18 1.69		-1.15	1.73		-1.27 1.59
Full-time/graduated	-2			72.6			72.2			73.6	
Part-time	-1			13.8			13.5			14.7	
Drop-out, expelled, or suspended	3			13.6			14.2			11.7	
Youth believes there is value in getting an education	X		-1	2		0.43 1.11		0.46	1.10		0.32 1.12
Believes	-1			35.3			33.8			39.9	
Somewhat believes	1			51.2			52.1			48.3	
Does not believe	2			13.5			14.1			11.9	
Youth believes school provides an encouraging environment for him or her	X		-1	2		0.85 1.07		0.86	1.06		0.83 1.08
Believes	-1			21.9			21.6			23.0	
Somewhat believes	1			49.2			49.4			48.5	

Does not believe		2			28.9			29.0		28.5		
School staff youth likes or feels comfortable talking with	X		-2	0		-0.59	0.75		-0.59	0.75	-0.60	0.75
Two or more		-2			16.1			16.2		15.9		
One		-1			27.2			26.8		28.5		
None		0			56.6			57.0		55.6		
Involvement in school activities during most recent term	X		-2	2		1.17	1.14		1.15	1.16	1.23	1.11
Involved in two or more		-2			4.0			4.1		3.4		
Involved in one		-1			11.5			11.9		10.6		
Interested but not involved		1			32.4			32.7		31.5		
Not interested		2			52.1			51.3		54.5		
Conduct in most recent term	X		-2	3		1.04	1.55		1.09	1.55	0.89	1.56
Good behavior		-2			1.6			1.5		1.9		
No problems		-1			30.4			29.4		33.7		
Problems reported by teachers		1			16.4			16.3		16.6		
Problem calls to parents		2			33.6			33.6		33.3		
Calls to police		3			18.1			19.2		14.6		
Number of expulsions & suspensions in most recent term	X		-1	3		0.24	1.34		0.30	1.35	0.06	1.29
None		-1			50.2			48.0		56.9		
One		1			30.6			31.5		27.8		
Two or three		2			13.8			14.6		11.3		
More than three		3			5.4			5.9		4.0		
Attendance in most recent term	X		-2	3		1.09	1.79		1.01	1.80	1.31	1.77
Good attendance		-2			14.5			15.1		12.7		
No unexcused absences		-1			14.2			15.0		11.9		
Some partial-day absences		1			18.2			18.8		16.1		
Some full-day absences		2			25.7			25.8		25.5		
Truant		3			27.4			25.3		33.8		
Academic performance in most recent term	X		-3	2		0.71	1.32		0.74	1.30	0.61	1.38
Mostly As		-3			0.6			0.5		0.8		
Mostly As and Bs		-2			4.8			4.4		6.1		
Mostly Bs and Cs		-1			23.9			23.2		26.1		
Mostly Cs and Ds		1			35.5			6.5		32.3		
Some Ds and mostly Fs		2			35.2			35.4		34.7		
Likelihood youth will stay in and graduate from high school or vocational school	X		-1	2		0.80	1.01		0.81	1.01	0.75	1.02
Very likely		-1			21.2			20.8		22.5		
Uncertain		1			56.9			56.6		57.7		
Not likely		2			21.9			22.7		19.8		
<b>HISTORIC USE OF FREE TIME</b>												
History of pro-social structured recreational activities within past 5yrs			-2	0		-0.93	0.77		-0.94	0.77	-0.89	0.77
Involved in two or more		-2			26.5			27.0		24.9		
Involved in one		-1			39.8			40.1		38.9		
Never involved		0			33.7			32.9		36.1		



History of unstructured pro-social recreational activities within past 5yrs		-2	0		-1.08	0.74		-1.11	0.74		-0.99	0.75
Involved in two or more		-2		31.6			33.0			27.2		
Involved in one		-1		44.5			44.6			44.1		
Never involved		0		23.9			22.3			28.7		
<b>CURRENT USE OF FREE TIME</b>												
Current interest & involvement supervised, structured pro-social recreational activities	X	-3	0		-0.80	0.87		-0.82	0.88		-0.75	0.85
Involved in two or more		-3		4.4			4.7			3.5		
Involved in one		-2		16.8			17.1			16.0		
Interested but not involved		-1		33.1			33.3			32.7		
Not interested		0		45.6			44.9			47.8		
Types of structured recreational activities in which youth currently participates	X											
No pro-social activities		0	1		0.21	0.41		0.21	0.41		0.19	0.39
None		0		79.1			78.5			80.8		
One or more		1		20.9			21.5			19.2		
Current interest & involvement in pro-social unstructured recreational activities	X	-3	1		-1.17	1.48		-1.24	1.47		-0.95	1.50
Involved in two or more		-3		19.5			20.7			15.8		
Involved in one		-2		33.0			34.3			29.1		
Interested but not involved		-1		19.9			19.1			22.2		
Not interested		1		27.7			25.9			33.0		
<b>EMPLOYMENT HISTORY</b>												
History of employment		-1	0		-0.22	0.42		-0.23	0.42		-0.19	0.40
Has been employed		-1		22.2			23.1			19.4		
Too young or never employed		0		77.8			76.9			80.6		
History of successful employment		-1	0		-0.79	0.40		-0.80	0.40		-0.77	0.42
Yes		-1		79.5			80.1			77.4		
No		0		20.5			19.9			22.6		
History of problems while employed		0	2		0.42	0.66		0.39	0.65		0.51	0.71
Never fired/quit		0		68.2			69.9			61.9		
Fired/quit: Poor performance		1		22.1			21.1			25.5		
Fired/quit: Didn't get along		2		9.8			9.0			12.6		
History of positive personal relationship(s) with past employer(s) or adult coworker(s)		-2	0		-0.89	0.74		-0.90	0.74		-0.88	0.75
Two or more		-2		22.5			22.5			22.8		
One		-1		44.2			44.7			42.5		
None		0		33.2			32.8			34.7		
<b>CURRENT EMPLOYMENT</b>												
Understanding of what is required to maintain a job	X	-2	0		-0.64	0.65		-0.65	0.65		-0.62	0.64
Demonstrated ability		-2		9.5			9.8			8.8		
Has knowledge		-1		44.8			45.0			44.3		
Lacks knowledge		0		45.6			45.2			46.9		

Current interest in employment	X	-3	0	-0.96	0.93	-0.98	0.93	-0.90	0.92
Employed		-3		5.7		5.9		5.1	
Not employed, high interest		-2		23.7		24.1		22.5	
Not employed, some interest		-1		31.4		31.8		30.1	
Not interested or too young		0		39.2		38.2		42.3	
Current employment status	X	-1	1	-0.15	0.51	-0.09	0.30	-0.08	0.29
Employment going well		-1		9.2		9.4		8.5	
Not employed		0		90.4		90.2		91.0	
Problems with current employment		1		0.5		0.5		0.5	
Current positive personal relationship(s) with employer(s) or adult coworker(s)	X	-1	0	-0.15	0.35	-0.15	0.35	-0.14	0.35
One or more positive relationships		-1		14.5		14.6		14.4	
Not employed or employed, no positive relationships		0		85.5		85.4		85.6	
<b>HISTORY OF RELATIONSHIPS</b>									
History of positive adult non-family relationships no connected to school or employment		-3	0	-0.81	0.92	-0.81	0.92	-0.81	0.91
Three or more		-3		7.1		7.2		6.9	
Two		-2		13.1		13.0		13.4	
One		-1		33.4		33.1		34.1	
None		0		46.5		46.7		45.7	
History of anti-social friends/companions (overall)		-1	3	1.35	1.02	1.38	1.05	1.32	0.94
Only prosocial		-1		7.2		7.5		6.2	
No friends or mix of antisocial and prosocial friends		1		61.6		60.5		64.9	
Only antisocial		2		11.8		11.2		13.8	
Gang member		3		19.4		20.8		15.1	
Never had consistent friends		0	1	0.06	0.24	0.07	0.25	0.05	0.22
No		0		93.7		93.3		94.8	
Yes		1		6.3		6.7		5.2	
Only pro-social friends		0	1	0.75	0.43	0.74	0.44	0.76	0.43
No		0		25.2		25.5		24.3	
Yes		1		74.8		74.5		75.7	
Pro-social and anti-social friends		0	1	0.68	0.47	0.67	0.47	0.70	0.46
No		0		32.4		33.1		30.5	
Yes		1		67.6		66.9		69.5	
Only anti-social friends		0	1	0.86	0.35	0.85	0.35	0.88	0.32
No		0		14.0		14.7		11.6	
Yes		1		86.0		85.3		88.4	
Gang member		0	1	0.19	0.40	0.21	0.41	0.15	0.36
No		0		80.6		79.2		84.9	
Yes		1		19.4		20.8		15.1	
<b>CURRENT RELATIONSHIPS</b>									

Current positive adult non-family relationships not connected to school or employment	X	-3	0	-0.73	0.88	-0.72	0.88	-0.73	0.88
Three or more		-3		5.9		6.0		5.9	
Two		-2		11.2		11.1		11.3	
One		-1		32.5		32.3		32.8	
None		0		50.5		50.6		50.1	
Current pro-social community ties	X	-2	0	-0.64	0.56	-0.65	0.56	-0.63	0.56
Strong ties		-2		4.3		4.4		3.8	
Some ties		-1		55.7		55.7		55.5	
None		0		40.1		39.9		40.7	
Current friends/companions youth spends time with (overall)	X	-1	3	1.42	1.07	1.43	1.10	1.38	0.99
Only prosocial		-1		8.3		8.6		7.1	
No friends or mix of antisocial and prosocial		1		54.3		53.6		56.3	
Only antisocial		2		16.9		15.6		20.7	
Gang member		3		20.6		22.1		15.9	
No consistent friends		0	1	0.09	0.28	0.09	0.29	0.08	0.27
No		0		91.3		91.0		92.3	
Yes		1		8.7		9.0		7.7	
Only pro-social friends		0	1	0.64	0.49	0.64	0.48	0.64	0.48
No		0		35.7		35.6		36.0	
Yes		1		64.3		64.6		64.0	
Pro-social and anti-social friends		0	1	0.56	0.50	0.56	0.50	0.57	0.50
No		0		44.0		44.3		43.2	
Yes		1		56.0		55.7		56.8	
Only anti-social friends		0	1	0.83	0.38	0.82	0.38	0.85	0.36
No		0		17.2		17.9		14.8	
Yes		1		82.8		82.1		85.2	
Is a gang member		0	1	0.21	0.40	0.22	0.42	0.16	0.37
No		0		79.4		77.9		84.1	
Yes		1		20.6		22.1		15.9	
Currently in a romantic, intimate, or sexual relationship	X	-1	1	-0.03	0.56	-0.10	0.51	0.20	0.63
Involved with prosocial person		-1		17.0		18.8		11.9	
Not involved		0		68.7		72.7		56.5	
Involved with antisocial person		1		14.3		8.5		31.6	
Currently admires anti-social peers	X	-1	2	0.77	1.08	0.76	1.08	0.78	1.07
No		-1		24.1		24.4		23.2	
Somewhat		1		50.7		50.3		52.0	
Yes		2		25.2		25.3		24.8	
Current resistance to anti-social peer influence	X	-2	2	0.09	1.23	0.07	1.24	0.12	1.20
No association		-2		10.3		10.8		8.6	
Usually resists		-1		33.9		33.7		34.4	
Rarely resists		1		48.8		48.1		50.7	
Leads antisocial peers		2		7.1		7.3		6.3	

FAMILY HISTORY										
History of court-ordered or DSHS voluntary out-of-home and shelter care placements exceeding 30 days		-1	3		-0.37	1.21		-0.44	1.16	-0.18 1.35
None	-1			76.7		79.0			70.0	
One	1			13.1		12.1			16.1	
Two	2			4.0		3.6			5.5	
Three or more	3			6.1		5.3			8.5	
History of running away or getting kicked out of home		-1	4		1.02	1.97		0.74	1.91	1.83 1.93
No history	-1			43.3		49.3			25.3	
One instance	1			13.1		13.3			12.6	
Two to three	2			17.5		16.4			20.7	
Four to five	3			7.2		6.1			10.5	
Over five	4			18.9		14.9			30.8	
History of petitions filed		-1	1		-0.57	0.82		-0.63	0.78	-0.41 0.91
No history	-1			78.7		81.4			70.5	
History	1			21.3		18.6			29.5	
History of jail/imprisonment of persons involved in the household for at least 3 months (overall)		-1	1		0.28	0.96		0.24	0.97	0.37 0.93
No history	-1			36.2		37.8			31.3	
History	1			63.8		62.2			68.7	
No family imprisonment		0	1		0.36	0.48		0.38	0.49	0.32 0.46
History	0			63.7		62.1			68.5	
No history	1			36.3		37.9			31.5	
Mother/female caretaker		0	1		0.31	0.46		0.29	0.45	0.38 0.49
No	0			68.7		71.1			61.8	
Yes	1			31.3		28.9			38.2	
Father/male caretaker		0	1		0.43	0.50		0.43	0.49	0.45 0.50
No	0			56.6		57.2			54.7	
Yes	1			43.4		42.8			45.3	
Sibling		0	1		0.21	0.41		0.20	0.40	0.24 0.42
No	0			78.8		79.6			76.4	
Yes	1			21.2		20.4			23.6	
Other family member		0	1		0.08	0.26		0.07	0.25	0.09 0.29
No	0			92.5		93.1			90.5	
Yes	1			7.5		6.9			9.5	
Has been living under any adult supervision	X	-1	1		-0.95	0.30		-0.96	0.28	-0.94 0.34
Yes	-1			97.7		98.0			96.9	
No	1			2.3		2.0			3.1	
CURRENT LIVING ARRANGEMENTS										
Currently living with (overall)	X	-1	1		-0.83	0.39		-0.84	0.38	-0.80 0.42
Mother or father	-1			83.5		84.4			80.7	
Living alone or with other	0			15.9		15.0			18.6	
Transient	1			0.6		0.5			0.7	
Living alone		0	1		0.00	0.03		0.00	0.03	0.00 0.03

No	0			99.9			99.9			99.9		
Yes	1			0.1			0.1			0.1		
Transient living		0	1		0.01	0.08		0.01	0.08		0.01	0.10
No	0			99.3			99.4			99.1		
Yes	1			0.7			0.6			0.9		
Mother		0	1		0.73	0.44		0.74	0.44		0.70	0.46
No	0			27.0			26.1			29.5		
Yes	1			73.0			73.9			70.5		
Father		0	1		0.45	0.50		0.47	0.50		0.40	0.49
No	0			54.6			52.7			60.4		
Yes	1			45.5			47.3			39.6		
Sibling(s)		0	1		0.60	0.49		0.61	0.49		0.56	0.50
No	0			40.5			39.4			43.6		
Yes	1			59.5			60.6			56.4		
Grandparent(s)		0	1		0.11	0.32		0.11	0.31		0.12	0.33
No	0			88.6			88.8			87.9		
Yes	1			11.4			11.2			12.1		
Other relative(s)		0	1		0.17	0.38		0.16	0.37		0.19	0.39
No	0			82.9			83.6			81.1		
Yes	1			17.1			16.4			18.9		
Foster/group home		0	1		0.05	0.22		0.04	0.20		0.07	0.25
No	0			95.1			95.7			93.3		
Yes	1			4.9			4.3			6.7		
Friends		0	1		0.02	0.13		0.02	0.13		0.02	0.15
No	0			98.2			98.4			97.8		
Yes	1			1.8			1.6			2.2		
Annual combined income youth & family	X	-2	2		0.87	1.20		0.84	1.21		0.95	1.15
\$50,000 and over	-2			7.3			7.7			6.0		
\$35,000 to \$49,000	-1			11.9			12.1			11.0		
\$15,000 to \$34,999	1			48.7			48.9			48.2		
Under \$15,000	2			32.2			31.3			34.8		
Jail/imprisonment history of persons involved with the household (overall)	X	-1	1		-0.08	1.00		-0.10	1.00		-0.01	1.00
No history	-1			52.6			55.0			50.4		
History	1			46.2			45.0			49.6		
No jail		0	1		0.54	0.50		0.55	0.50		0.50	0.50
Imprisoned	0			46.3			45.1			50.1		
Not imprisoned	1			53.7			54.9			49.9		
Mother		0	1		0.20	0.40		0.19	0.39		0.24	0.43
No	0			80.0			81.5			75.5		
Yes	1			20.0			18.5			24.5		
Father		0	1		0.21	0.41		0.21	0.41		0.20	0.40
No	0			79.1			78.9			79.7		
Yes	1			20.9			21.1			20.3		
Sibling		0	1		0.15	0.36		0.15	0.36		0.16	0.37
No	0			84.9			85.2			84.0		
Yes	1			15.1			14.8			16.0		
Other family member		0	1		0.05	0.21		0.04	0.20		0.06	0.24

No	0			95.2			95.6			94.0		
Yes	1			4.8			4.4			6.0		
Problem history of parents involved with the household (overall)	X		-1	1		0.04	1.00		0.00	1.00		0.14 0.99
No history	-1			48.1			49.8			42.9		
History	1			51.9			50.2			57.1		
No problem history			0	1		0.48	0.50		0.50	0.50		0.43 0.05
History	0			51.6			49.8			56.9		
No history	1			48.4			50.2			43.1		
Alcohol history			0	1		0.26	0.44		0.25	0.43		0.29 0.45
No	0			74.4			75.5			71.1		
Yes	1			25.6			24.5			28.9		
Drug history			0	1		0.22	0.41		0.21	0.41		0.25 0.44
No	0			78.0			79.1			74.5		
Yes	1			22.0			20.9			25.5		
Physical health history			0	1		0.17	0.37		0.16	0.37		0.18 0.38
No	0			83.5			84.0			82.0		
Yes	1			16.5			16.0			18.0		
Mental health history			0	1		0.14	0.35		0.13	0.34		0.18 0.38
No	0			85.8			86.9			82.4		
Yes	1			14.2			13.1			17.6		
Employment history			0	1		0.24	0.43		0.23	0.42		0.26 0.44
No	0			76.2			76.9			74.0		
Yes	1			23.8			23.1			26.0		
Problem history of sibling involved with the household (overall)	X		-1	1		-0.25	0.76		-0.27	0.76		-0.18 0.78
No history	-1			44.8			46.2			40.7		
No siblings	0			35.4			35.0			36.7		
History	1			19.8			18.8			22.6		
No siblings in the house			0	1		0.65	0.48		0.66	0.47		0.64 0.48
None	0			34.6			34.3			35.6		
One or more	1			65.4			65.7			64.4		
No problem history of siblings			0	1		0.44	0.50		0.45	0.50		0.50 0.49
History	0			56.0			54.5			60.3		
No history	1			44.0			45.5			39.7		
Alcohol history			0	1		0.10	0.30		0.09	0.29		0.12 0.32
No	0			90.1			90.6			88.5		
Yes	1			9.9			9.4			11.5		
Drug history			0	1		0.13	0.34		0.12	0.33		0.15 0.35
No	0			87.0			87.5			85.4		
Yes	1			13.0			12.5			14.6		
Physical health history			0	1		0.02	0.13		0.02	0.12		0.02 0.14
No	0			98.3			98.4			97.9		
Yes	1			1.7			1.6			2.1		
Mental health history			0	1		0.05	0.23		0.05	0.22		0.07 0.25
No	0			94.6			95.0			93.2		
Yes	1			5.4			5.0			6.8		
Employment history			0	1		0.03	0.17		0.03	0.17		0.04 0.18
No	0			96.9			97.0			96.5		

Yes		1			3.1			3.0		3.5		
Support network for family	X		-2	0		-0.97	0.58		-0.98	0.58	-0.93	0.57
Strong		-2			15.3			16.1		12.9		
Some		-1			66.2			65.8		67.3		
None		0			18.5			18.1		19.8		
Family willingness to help support youth	X		-1	3		0.00	1.19		-0.05	1.17	0.16	1.23
Consistent willingness		-1			56.0			58.1		49.6		
Inconsistent support		1			35.6			34.1		40.2		
Not willing		2			5.2			5.0		5.8		
Hostile, berating, belittling		3			3.3			2.9		4.4		
Family provides opportunities for youth to participate in family activities and decisions affecting youth	X		-1	2		0.78	0.93		0.76	0.94	0.85	0.91
Yes		-1			19.0			19.8		16.6		
Some		1			65.0			65.1		64.8		
No		2			16.0			15.1		18.6		
Has run away or been kicked out	X		-1	2		-0.15	1.03		-0.26	1.00	0.15	1.05
No		-1			58.9			63.8		44.3		
Yes		1			38.6			34.2		51.8		
Current runaway		2			2.5			2.0		3.9		
Family member(s) youth feels close to or has good relationship with (overall)	X		-1	1		-0.59	0.81		-0.62	0.79	-0.51	0.86
Close		-1			79.5			80.8		75.4		
Not close		1			20.5			19.2		24.6		
Not close to family			0	1		0.20	0.40		0.19	0.39	0.24	0.43
Close		0			79.9			81.2		76.2		
Not close		1			20.1			18.8		23.8		
Close to mother			0	1		0.50	0.50		0.52	0.50	0.44	0.50
Not close		0			50.1			48.1		56.2		
Close		1			49.9			51.9		43.8		
Close to father			0	1		0.21	0.41		0.24	0.42	0.14	0.35
Not close		0			78.7			76.4		85.7		
Close		1			21.3			23.6		14.3		
Close to male sibling			0	1		0.18	0.38		0.20	0.40	0.13	0.33
Not close		0			82.2			80.5		87.3		
Close		1			17.8			19.5		12.7		
Close to female sibling			0	1		0.16	0.36		0.15	0.35	0.18	0.39
Not close		0			84.4			85.3		81.6		
Close		1			15.6			14.7		18.4		
Close to extended family			0	1		0.19	0.39		0.19	0.39	0.20	0.40
Not close		0			80.8			80.9		80.3		
Close		1			19.2			19.1		19.7		
Level of conflict in household	X		-1	3		0.84	1.41		0.74	1.40	1.14	1.39
Some, well-managed		-1			30.4			33.2		22.1		
Verbal intimidation		1			42.9			42.5		43.9		
Threats of physical abuse		2			8.9			8.6		9.7		
Domestic violence		3			17.8			15.7		24.3		
Parental supervision	X		-1	2		0.49	1.22		0.47	1.21	0.56	1.22

Consistent	-1			37.4		38.1		35.4			
Sporadic	1			38.6		38.7		38.3			
Inadequate	2			24.0		23.2		26.3			
Parental authority and control	X	-1	2		0.90	1.02	0.86	1.03	1.04	0.97	
Usually obeys	-1			19.0		20.3		15.1			
Sometimes obeys	1			52.9		53.5		51.0			
Disobeys	2			28.2		26.3		33.9			
Consistent appropriate consequences for bad behavior	X	-1	2		0.30	1.45	0.25	1.44	0.44	1.45	
Consistent: appropriate	-1			54.6		56.3		49.6			
Consistent: severe or insufficient	1			6.1		5.7		7.2			
Inconsistent	2			39.3		38.0		43.2			
Consistent appropriate reward for good behavior	X	-1	2		0.45	1.27	0.42	1.27	0.55	1.26	
Consistent: appropriate	-1			41.2		42.4		37.5			
Consistent: insufficient or indulgent	1			31.6		31.3		32.5			
Inconsistent	2			27.2		26.3		30.0			
Parental characterization of youth's anti-social behavior	X	-1	3		-0.50	0.92	-0.50	0.92	-0.50	0.93	
Disapproves	-1			76.4		76.3		76.7			
Minimizes	1			20.8		21.1		20.0			
Accepts	2			2.6		2.5		3.1			
Proud of	3			0.2		0.2		0.3			
<b>ALCOHOL &amp; DRUG HISTORY</b>											
History of alcohol use (overall)		-2	2		0.17	1.39	0.11	1.41	0.34	1.33	
No history	-2			22.7		24.4		17.5			
History	0			37.7		37.9		37.3			
Disrupted education, caused family conflict interfered with prosocial friends, or caused health problems	1			17.3		16.1		21.1			
Contributed to criminal behavior	2			22.3		21.7		24.1			
No past alcohol use		0	1		0.23	0.42	0.24	0.43	0.18	0.38	
Use	0			77.3		75.5		82.5			
No use	0			22.7		24.5		17.5			
Past alcohol use		0	1		0.77	0.42	0.76	0.43	0.82	0.38	
No	0			22.7		24.4		17.6			
Yes	1			77.3		75.6		82.4			
Disrupted education		0	1		0.22	0.41	0.21	0.40	0.26	0.44	
No	0			78.1		79.3		74.4			
Yes	1			21.9		20.7		25.6			
Caused family conflict		0	1		0.27	0.45	0.26	0.44	0.32	0.47	
No	0			72.7		74.4		67.7			
Yes	1			27.3		25.6		32.3			
Interfered with pro-social friends		0	1		0.24	0.43	0.23	0.42	0.28	0.45	
No	0			76.0		77.4		71.6			
Yes	1			24.0		22.6		28.4			



Caused poor health	0	1	0.04	0.20	0.04	0.19	0.06	0.24
No	0		95.6		96.2		93.8	
Yes	1		4.4		3.8		6.2	
Contributed to criminal behavior	0	1	0.22	0.42	0.22	0.41	0.24	0.43
No	0		77.7		78.3		75.9	
Yes	1		22.3		21.7		24.1	
Alcohol tolerance	0	1	0.03	0.18	0.03	0.17	0.05	0.21
No	0		96.5		96.9		95.4	
Yes	1		3.5		3.1		4.6	
Alcohol withdrawal	0	1	0.01	0.11	0.01	0.10	0.02	0.13
No	0		98.7		98.9		98.2	
Yes	1		1.3		1.1		1.8	
History of drug use (overall)	-2	4	1.51	2.07	1.49	2.10	1.57	1.98
No history	-2		19.3		20.1		16.9	
History	1		29.4		29.2		29.9	
Disrupted education, caused family conflict interfered with prosocial friends, or caused health problems	2		22.7		21.7		25.6	
Contributed to criminal behavior	4		28.6		29.0		27.5	
No past drug use	0	1	0.19	0.40	0.20	0.40	0.17	0.38
Use	0		80.6		79.8		83.0	
No use	1		19.4		20.2		17.0	
Past drug use	0	1	0.81	0.39	0.80	0.40	0.83	0.38
No	0		19.3		20.1		17.0	
Yes	1		80.7		79.9		83.0	
Disrupted education	0	1	0.36	0.48	0.36	0.48	0.37	0.48
No	0		63.7		64.0		62.7	
Yes	1		36.3		36.0		37.3	
Caused family conflict	0	1	0.37	0.48	0.36	0.48	0.40	0.49
No	0		62.8		63.8		59.8	
Yes	1		37.2		36.2		40.2	
Interfered with pro-social friends	0	1	0.34	0.47	0.33	0.47	0.37	0.48
No	0		65.9		66.9		63.0	
Yes	1		34.1		33.1		37.0	
Caused health problems	0	1	0.06	0.23	0.05	0.21	0.08	0.27
No	0		94.5		95.3		92.0	
Yes	1		5.5		4.7		8.0	
Contributed to criminal behavior	0	1	0.29	0.45	0.29	0.45	0.28	0.45
No	0		71.4		71.0		72.5	
Yes	1		28.6		29.0		27.5	
Drug tolerance	0	1	0.07	0.26	0.07	0.25	0.09	0.28
No	0		92.7		93.1		91.4	
Yes	1		7.3		6.9		8.6	
Drug withdrawal	0	1	0.03	0.17	0.03	0.16	0.04	0.20
No	0		97.0		97.3		95.9	

Yes	1			3.0			2.7			4.1		
History of referrals for drug/alcohol assessment		0	3		0.98	1.24		0.96	1.23		1.03	1.26
No problem or never referred	0			57.2			57.7			55.7		
Referred but not assessed	1			8.3			8.3			8.3		
Diagnosed as abuse	2			13.8			13.9			13.5		
Diagnosed as dependent	3			20.7			20.1			22.5		
History of attending alcohol/drug education classes		-3	0		-0.45	0.79		-0.45	0.79		-0.46	0.80
Voluntarily attended	-3			2.9			2.8			3.0		
Attended at request	-2			10.6			10.6			10.6		
Attended at court direction	-1			15.3			15.2			15.7		
Never attended	0			71.2			71.4			70.7		
History of participating in alcohol/drug treatment program		-1	0		-0.26	0.44		-0.26	0.44		-0.27	0.45
Participated	-1			26.3			25.9			27.3		
Has not participated	0			73.7			74.1			72.7		
Youth using alcohol/drugs	X	-3	1		-0.11	1.79		-0.11	1.79		-0.09	1.78
No	-3			27.7			27.8			27.3		
Yes	1			72.3			72.2			72.7		
<b>CURRENT ALCOHOL &amp; DRUGS</b>												
Alcohol use (overall)	X	0	3		1.21	1.19		1.19	1.20		1.28	1.17
Not using	0			39.4			40.7			35.6		
Not disrupting functioning	1			23.1			22.7			24.0		
Disrupting education, causes family conflict interferes with keeping prosocial friends, or causes health problems	2			14.5			13.5			17.4		
Contributes to criminal behavior	3			23.0			23.1			22.9		
No current alcohol use		0	1		0.30	0.44		0.31	0.46		0.27	0.45
Yes	0			70.3			69.5			72.8		
No	1			29.7			30.5			27.2		
Not disrupting functioning		0	1		0.44	0.50		0.43	0.49		0.47	0.50
No	0			56.2			57.2			53.2		
Yes	1			43.8			42.8			46.8		
Disrupts education		0	1		0.14	0.35		0.14	0.34		0.16	0.37
No	0			85.7			86.3			84.0		
Yes	1			14.3			13.7			16.0		
Causes family conflict		0	1		0.19	0.39		0.18	0.39		0.22	0.41
No	0			80.9			81.8			78.2		
Yes	1			19.1			18.2			21.8		
Interferes with prosocial friends		0	1		0.17	0.37		0.16	0.37		0.19	0.39
No	0			83.1			83.8			80.8		
Yes	1			16.9			16.2			19.2		
Causes health problems		0	1		0.03	0.18		0.03	0.17		0.04	0.20
No	0			96.8			97.1			95.7		
Yes	1			3.2			2.9			4.3		

Contributes to criminal behavior		0	1		0.17	0.37		0.17	0.37		0.17	0.37
No		0		83.3			83.3			83.3		
Yes		1		16.7			16.7			16.7		
Alcohol tolerance	X	0	1		0.02	0.15		0.02	0.15		0.03	0.17
No		0		97.6			97.8			96.9		
Yes		1		2.4			2.2			3.1		
Alcohol withdrawal	X	0	1		0.01	0.09		0.01	0.09		0.01	0.11
No		0		99.1			99.2			98.7		
Yes		1		0.9			0.8			1.3		
Current drug use (overall)	X	0	4		2.29	1.39		2.32	1.39		2.19	1.40
Not using		0		18.1			17.5			20.1		
Not disrupting functioning OR use disrupting education, causes family conflict interferes with keeping prosocial friends, or causes health problems		2		49.3			49.0			50.1		
Contributes to criminal behavior		4		32.6			33.5			29.8		
No current drug use		0	1		0.15	0.36		0.14	0.35		0.17	0.37
Yes		0		85.2			85.7			83.5		
No		1		14.8			14.3			16.5		
Not disrupting functioning		0	1		0.59	0.49		0.60	0.49		0.58	0.49
No		0		40.8			40.4			41.9		
Yes		1		59.2			59.6			58.1		
Disrupts education		0	1		0.28	0.45		0.28	0.45		0.28	0.45
No		0		72.0			71.8			72.4		
Yes		1		28.0			28.2			27.6		
Drug use causes family conflict		0	1		0.30	0.46		0.30	0.46		0.31	0.46
No		0		69.7			69.8			69.1		
Yes		1		30.3			30.2			30.9		
Interferes with prosocial friends		0	1		0.28	0.45		0.27	0.45		0.29	0.45
No		0		72.4			72.8			71.4		
Yes		1		27.6			27.2			28.6		
Causes health problems		0	1		0.05	0.21		0.04	0.20		0.07	0.25
No		0		95.2			95.9			93.3		
Yes		1		4.8			4.1			6.7		
Contributes to criminal behavior		0	1		0.24	0.42		0.24	0.43		0.22	0.41
No		0		76.5			75.8			78.3		
Yes		1		23.5			24.2			21.7		
Drug tolerance	X	0	1		0.06	0.25		0.06	0.24		0.07	0.26
No		0		93.6			93.9			92.6		
Yes		1		6.4			6.1			7.4		
Drug withdrawal	X	0	1		0.03	0.16		0.03	0.16		0.04	0.19
No		0		97.2			97.5			96.4		
Yes		1		2.8			2.5			3.6		
Type of drugs currently used	X											

Marijuana		0	1		0.58	0.49		0.58	0.49		0.55	0.50
No		0		42.4				41.6			44.6	
Yes		1		57.6				58.4			55.4	
Amphetamines		0	1		0.09	0.29		0.08	0.27		0.15	0.36
No		0		90.5				92.4			85.1	
Yes		1		9.5				7.6			14.9	
Cocaine		0	1		0.05	0.22		0.05	0.21		0.07	0.25
No		0		94.9				95.4			93.3	
Yes		1		5.1				4.6			6.7	
Heroin		0	1		0.02	0.13		0.01	0.12		0.03	0.17
No		0		98.2				98.6			96.9	
Yes		1		1.8				1.4			3.1	
Other drug		0	1		0.09	0.29		0.08	0.28		0.11	0.31
No		0		91.0				91.5			89.3	
Yes		1		9.0				8.5			10.7	
Alcohol/drug treatment program participation	X	-2	1		0.34	0.84		0.35	0.83		0.31	0.84
Successfully completed		-2		2.2				2.1			2.4	
Currently attending		-1		17.1				16.9			17.9	
Treatment not warranted		0		25.4				25.1			26.5	
Needs treatment, not attending		1		55.3				55.9			53.3	
MENTAL HEALTH HISTORY												
History of suicidal ideation												
No thoughts of suicide		0	1		0.74	0.44		0.79	0.41		0.59	0.49
Yes		0		26.4				21.4			41.1	
No		1		73.6				78.6			58.9	
Serious thoughts of suicide		0	1		0.17	0.38		0.15	0.35		0.26	0.44
No		0		82.6				85.4			74.2	
Yes		1		17.4				14.6			25.8	
Has made a plan		0	1		0.03	0.17		0.02	0.15		0.05	0.21
No		0		97.0				97.7			95.2	
Yes		1		3.0				2.3			4.8	
Has attempted		0	1		0.07	0.25		0.05	0.21		0.13	0.34
No		0		93.1				95.3			86.6	
Yes		1		6.9				4.7			13.4	
Hopeless		0	1		0.04	0.19		0.03	0.17		0.06	0.24
No		0		96.2				96.9			94.0	
Yes		1		3.8				3.1			6.0	
Self-mutilating		0	1		0.04	0.19		0.02	0.15		0.09	0.28
No		0		96.2				97.8			91.3	
Yes		1		3.8				2.2			8.7	
History of physical abuse (overall)		-1	1		-0.36	0.93		-0.43	0.91		-0.17	0.98
No		-1		68.1				71.3			58.7	
Yes		1		31.9				28.7			41.3	
Not a victim of physical abuse		0	1		0.69	0.46		0.72	0.45		0.59	0.49
Yes		0		31.3				28.2			40.6	
No		1		68.7				71.8			59.4	
Physical abuse: family member		0	1		0.22	0.42		0.20	0.40		0.28	0.45

No	0			77.8			79.6			72.2	
Yes	1			22.2			20.4			27.8	
Physical abuse: in the home		0	1		0.09	0.29		0.08	0.27		0.12 0.32
No	0			91.0			92.0			88.1	
Yes	1			9.0			8.0			11.9	
Physical abuse: someone outside the family		0	1		0.08	0.28		0.07	0.25		0.13 0.34
No	0			91.7			93.3			86.8	
Yes	1			8.3			6.7			13.2	
Physical abuse: foster home		0	1		0.01	0.07		0.00	0.07		0.01 0.08
No	0			99.5			99.5			99.3	
Yes	1			0.5			0.5			0.7	
Physical abuse: with a weapon		0	1		0.01	0.10		0.01	0.10		0.01 0.10
No	0			99.0			98.9			99.0	
Yes	1			1.0			1.1			1.0	
Has not witnessed violence		0	1		0.10	0.31		0.11	0.31		0.09 0.29
Yes	0			89.5			89.0			91.0	
No	1			10.5			11.0			9.0	
Witnessed violence in the home		0	1		0.19	0.39		0.17	0.38		0.23 0.42
No	0			81.2			82.7			76.6	
Yes	1			18.8			17.3			23.4	
Witnessed violence in foster home		0	1		0.01	0.10		0.01	0.10		0.02 0.12
No	0			98.9			99.1			98.5	
Yes	1			1.1			0.9			1.5	
Witnessed violence in the community		0	1		0.20	0.40		0.19	0.39		0.22 0.41
No	0			80.2			80.8			78.5	
Yes	1			19.8			19.2			21.5	
Witnessed murder		0	1		0.01	0.08		0.01	0.08		0.01 0.08
No	0			99.3			99.3			99.4	
Yes	1			0.7			0.7			0.6	
History of sexual abuse (overall)		-1	1		-0.71	0.71		-0.84	0.54		-0.31 0.95
No	-1			85.4			92.0			65.6	
Yes	1			14.6			8.0			34.4	
Not a victim of sexual abuse		0	1		0.86	0.35		0.92	0.27		0.66 0.47
Yes	0			14.4			7.9			33.9	
No	1			85.6			92.1			66.1	
Sexual abuse: family member		0	1		0.07	0.25		0.04	0.20		0.14 0.35
No	0			93.4			95.9			86.1	
Yes	1			6.6			4.1			13.9	
Sexual abuse: someone outside the family		0	1		0.09	0.29		0.04	0.20		0.24 0.43
No	0			90.7			95.7			76.1	
Yes	1			9.3			4.3			23.9	
History of being a victim of neglect		-1	1		-0.48	0.88		-0.52	0.85		-0.36 0.93
No	-1			74.1			76.2			67.8	
Yes	1			25.9			23.8			32.2	
History of ADD/ADHD		-1	2		-0.32	1.06		-0.25	1.09		-0.56 0.92
No	-1			69.9			66.4			80.4	
Medication or treatment	1			22.7			25.4			14.4	

prescribed											
Medication and treatment prescribed	2			7.5			8.2			5.2	
History of mental health problems		-1	2		-0.25	1.16		-0.32	1.12		-0.06 1.23
No	-1			69.4			72.0			61.6	
Medication or treatment prescribed	1			17.3			15.9			21.5	
Medication and treatment prescribed	2			13.3			12.1			16.9	
Health insurance	X		-1	1		-0.88	0.47		-0.87	0.49	
Yes	-1			94.1			93.7			95.1	
No	1			5.9			6.3			4.9	
Current mental health problem status	X		-1	1		-0.40	0.92		-0.45	0.90	
No	-1			70.1			72.3			63.5	
Yes	1			29.9			27.7			36.5	
Anger		0	3		1.49	0.96		1.45	0.96		1.60 0.94
No history	0			12.8			14.0			9.5	
Occasional feelings	1			45.6			46.4			43.4	
Consistent feelings	2			21.2			20.0			24.6	
Aggressive reactions	3			20.4			19.6			22.5	
Depression		0	3		1.02	0.83		0.93	0.81		1.27 0.84
No history	0			28.7			32.6			18.0	
Occasional feelings	1			44.9			45.1			44.4	
Consistent feelings	2			21.7			18.6			30.4	
Impairment in daily tasks	3			4.6			3.7			7.2	
Somatic complaints		0	3		0.32	0.64		0.28	0.61		0.43 0.71
No history	0			75.4			78.4			66.9	
One or two	1			19.4			17.0			26.2	
Three or four	2			3.0			2.6			4.1	
Five or more	3			2.2			2.0			2.8	
Delusions/hallucinations		0	1		0.05	0.21		0.04	0.20		0.05 0.22
No	0			95.5			95.7			95.0	
Yes	1			4.5			4.3			5.0	
Trauma		0	1		0.39	0.49		0.34	0.48		0.52 0.50
No	0			60.9			65.6			48.0	
Yes	1			39.1			34.4			52.0	
<b>CURRENT MENTAL HEALTH</b>											
Current suicide ideation	X										
No recent thoughts		0	1		0.23	0.42		0.19	0.40		0.31 0.46
No	-1			77.2			80.6			69.1	
Yes	0			22.8			19.4			30.9	
Recent plan		0	1		0.01	0.09		0.01	0.08		0.01 0.12
No	0			99.2			99.4			98.6	
Yes	1			0.8			0.6			1.4	
Recent attempt		0	1		0.01	0.11		0.01	0.09		0.03 0.16
No	0			98.7			99.1			97.4	
Yes	1			1.3			0.9			2.6	
Hopeless		0	1		0.01	0.10		0.01	0.09		0.02 0.12
No	0			99.1			99.3			98.5	

Yes	1			0.9			0.7			1.5		
Self-mutilation		0	1		0.01	0.11		0.01	0.08		0.03	0.16
No	0			98.9			99.4			97.4		
Yes	1			1.1			0.6			2.6		
Currently diagnosed with ADD/ADHD	X	-1	1		-0.09	0.61		-0.11	0.66		-0.04	0.48
Compliant with medication		-1		23.7			28.1			13.7		
No problem or no medication		0		61.6			54.9			76.7		
Non-compliant with medication		1		14.8			17.0			9.6		
Mental health treatment currently prescribed, excluding ADD/ADHD treatment	X	-1	1		-0.21	0.75		-0.22	0.73		-0.20	0.80
Attending treatment		-1		41.4			40.1			44.1		
No treatment need		0		38.6			41.5			32.0		
Non-compliant with treatment		1		20.0			18.4			23.8		
Mental health medication currently prescribed, excluding ADD/ADHD medication	X	-1	1		-0.21	0.67		-0.23	0.66		-0.18	0.70
Compliant with medication		-1		35.4			35.6			35.0		
No medication need		0		50.1			51.2			47.6		
Non-compliant with medication		1		14.4			13.1			17.4		
Mental health problems currently interfere with working with the youth	X	0	1		0.32	0.47		0.33	0.47		0.31	0.46
No problem or mental health does not interfere		0		67.9			67.2			69.5		
Yes		1		32.1			32.8			30.5		
<b>ATTITUDES/BEHAVIORS</b>												
Primary emotion when committing last crime(s) within last 6 months	X	-1	1		0.64	0.77		0.65	0.76		0.61	0.79
Nervous, afraid, worried, uncertain		-1		18.0			17.6			19.3		
Hyper, excited, stimulated, confident, or unconcerned		1		82.0			82.4			80.7		
Primary purpose for committing crime(s) within last 6 months	X											
Anger/revenge		0	1		0.26	0.44		0.23	0.42		0.33	0.47
No		0		84.2			76.6			66.9		
Yes		1		15.8			23.4			33.1		
Power		0	1		0.01	0.10		0.00	0.06		0.01	0.11
No		0		98.9			99.0			98.7		
Yes		1		1.1			1.0			1.3		
Impulse		0	1		0.19	0.39		0.19	0.39		0.18	0.39
No		0		81.0			80.8			81.6		
Yes		1		19.0			19.2			18.4		
Sexual desire		0	1		0.03	0.17		0.04	0.19		0.00	0.06
No		0		97.0			96.1			99.6		
Yes		1		3.0			3.9			0.4		
Money, material gain, or drugs		0	1		0.19	0.39		0.19	0.39		0.17	0.38
No		0		81.2			80.7			82.6		

Yes	1			18.8			19.3			17.4		
Excitement, amusement		0	1		0.15	0.36		0.16	0.37		0.13	0.34
No	0			84.7			84.0			86.7		
Yes	1			15.3			16.0			13.3		
Status, acceptance, attention		0	1		0.16	0.37		0.16	0.37		0.15	0.35
No	0			84.2			83.8			85.3		
Yes	1			15.8			16.2			14.7		
Optimism	X	-2	2		-0.30	1.06		-0.28	1.06		-0.34	1.07
High aspirations		-2		5.7			5.1			7.4		
Normal aspirations		-1		57.1			57.2			56.8		
Low aspirations		1		35.7			36.2			34.4		
Believes nothing matters		2		1.5			1.5			1.4		
Impulsive; acts before thinking	X	-2	2		0.29	1.27		0.30	1.27		0.28	1.27
Uses self-control		-2		4.8			4.6			5.3		
Some self-control		-1		37.4			37.4			37.2		
Impulsive		1		39.5			39.5			39.6		
Highly impulsive		2		18.4			18.5			17.9		
Belief in control over anti-social behavior	X	-2	2		0.18	1.44		0.18	1.44		0.19	1.45
Believes		-2		29.7			29.7			29.8		
Somewhat believes		1		62.6			62.8			62.2		
Does not believe		2		7.6			7.5			8.0		
Empathy, remorse, sympathy, or feelings for victim(s) of criminal behavior	X	-2	2		-0.15	1.59		-0.14	1.59		-0.16	1.59
Empathy		-2		17.5			17.3			18.0		
Some empathy		-1		48.2			48.3			47.9		
No empathy		2		34.3			34.3			34.1		
Respect for property of others	X	-2	3		0.80	1.77		0.85	1.76		0.65	1.80
Respects		-2		25.9			24.8			29.1		
Respects personal, not public		1		30.1			30.0			30.4		
Conditional respect for personal		2		30.4			30.9			28.9		
No respect		3		13.6			14.3			11.6		
Respect for authority figures	X	-2	3		0.01	1.81		0.02	1.82		-0.02	1.80
Respects		-2		42.7			42.6			43.1		
Does not respect		1		35.3			35.1			36.1		
Resents		2		15.1			15.4			14.3		
Defies or is hostile		3		6.8			6.9			6.5		
Attitude toward pro-social rules/conventions in society	X	-2	3		0.73	1.41		0.74	1.41		0.69	1.41
Abides		-2		18.4			18.3			18.9		
Believes rules sometimes apply		1		59.5			59.2			60.5		
Does not believe rules apply		2		16.1			16.5			15.0		
Resents rules		3		5.9			6.0			5.6		
Accepts responsibility for anti-social behavior	X	-2	3		0.34	1.60		0.33	1.61		0.36	1.60
Accepts responsibility		-2		29.9			30.1			29.4		
Minimizes antisocial behavior		1		50.3			50.3			50.5		
Accepts antisocial behavior		2		15.8			15.6			16.3		



Proud of antisocial behavior		3			4.0		4.0		3.9		
Youth's belief in successfully meeting conditions of court supervision	X		-1	2		0.06	1.07		0.06	1.07	0.04 1.06
Believes		-1			49.5		49.3		49.9		
Unsure		1			46.0		46.0		45.8		
Does not believe		2			4.6		4.7		4.3		
<b>AGGRESSION</b>											
Tolerance for frustration	X		-2	2		0.78	1.32		0.71	1.35	0.98 1.21
Rarely upset		-2			16.8		18.4		12.3		
Sometimes upset		1			54.7		55.3		52.9		
Often upset		2			28.5		26.4		34.9		
Hostile interpretation of actions & intentions of others	X		-2	2		-0.19	1.59		-0.22	1.59	-0.12 1.58
Positive view		-2			42.9		43.6		40.6		
Negative view		1			47.8		47.3		49.5		
Hostile view		2			9.3		9.1		10.0		
Belief in yelling & verbal aggression to resolve a disagreement or conflict	X		-2	2		0.68	1.36		0.62	1.39	0.87 1.28
Rarely appropriate		-2			19.0		20.4		14.8		
Sometimes appropriate		1			55.9		56.5		54.0		
Often appropriate		2			25.1		23.1		31.1		
Belief in fighting & physical aggression to resolve a disagreement or conflict	X		-2	2		0.67	1.81		0.66	1.81	0.69 1.82
Never appropriate		-2			14.3		14.2		14.5		
Rarely appropriate		-1			29.4		29.7		28.7		
Sometimes appropriate		2			44.4		44.4		44.3		
Often appropriate		3			11.9		11.7		12.5		
Reports/evidence of violence not included in criminal history	X										
No reports			0	1		0.45	0.50		0.46	0.50	0.43 0.49
Yes		0			54.7		53.8		57.1		
No		1			45.3		46.2		42.9		
Violent destruction of property			0	1		0.15	0.36		0.15	0.36	0.15 0.36
No		0			84.7		84.6		85.1		
Yes		1			15.3		15.4		14.9		
Violent outbursts, displays of temper, uncontrolled anger indicating potential for harm			0	1		0.50	0.50		0.49	0.50	0.54 0.50
No		0			49.6		50.9		45.7		
Yes		1			50.4		49.1		54.3		
Deliberately inflicted physical pain			0	1		0.17	0.37		0.16	0.37	0.18 0.39
No		0			83.5		84.0		81.9		
Yes		1			16.5		16.0		18.1		
Used/threatened with a weapon			0	1		0.08	0.26		0.08	0.27	0.05 0.23
No		0			92.5		91.8		94.6		
Yes		1			7.5		8.2		5.4		
Fire starting reports			0	1		0.04	0.20		0.05	0.21	0.02 0.15
No		0			95.9		95.3		97.8		

Yes	1			4.1			4.7		2.2		
Animal cruelty reports		0	1		0.01	0.12		0.02	0.12	0.01	0.10
No	0			98.6			98.4		99.1		
Yes	1			1.4			1.6		0.9		
Reports/evidence of sexual aggression not included in criminal history	X										
No reports of sexual aggression outside of criminal history		0	1		0.97	0.18		0.96	0.19	0.98	0.13
Yes	0			3.3			3.9		1.6		
No	1			96.7			96.1		98.4		
Reports of aggressive sex		0	1		0.01	0.10		0.01	0.11	0.01	0.07
No	0			99.0			98.9		99.5		
Yes	1			1.0			1.1		0.5		
Reports of sex for power		0	1		0.00	0.06		0.00	0.06	0.00	0.06
No	0			99.6			99.6		99.6		
Yes	1			0.4			0.4		0.4		
Reports of young sex partners		0	1		0.01	0.10		0.01	0.11	0.00	0.05
No	0			99.0			98.7		99.7		
Yes	1			1.0			1.3		0.3		
Reports of child sex		0	1		0.01	0.10		0.01	0.11	0.00	0.05
No	0			99.0			98.8		99.8		
Yes	1			1.0			1.2		0.2		
Reports of voyeurism		0	1		0.00	0.06		0.00	0.06	0.00	0.04
No	0			99.7			99.6		99.9		
Yes	1			0.3			0.4		0.1		
Reports of exposure		0	1		0.01	0.09		0.01	0.10	0.01	0.08
No	0			99.1			99.1		99.4		
Yes	1			0.9			0.9		0.6		
<b>SKILLS</b>											
Consequential thinking	X	-3	1		-0.99	0.89		-0.98	0.89	-1.03	0.89
Acts to obtain desired consequences		-3		3.3			3.2		3.8		
Identifies consequences of actions		-2		17.0			16.7		18.1		
Understands there are consequences to actions		-1		67.5			67.8		66.6		
Does not understand		1		12.1			12.3		11.5		
Goal-setting	X	-2	2		0.09	1.44		0.13	1.45	-0.01	1.43
Realistic goals		-2		8.5			8.0		10.1		
Somewhat realistic goals		-1		46.6			46.2		47.8		
Unrealistic goals		1		17.0			16.9		17.2		
No goals		2		28.0			29.0		24.8		
Problem-solving	X	-3	1		-0.60	1.13		-0.58	1.13	-0.64	1.13
Applies appropriate solutions		-3		2.5			2.4		2.8		
Thinks of solutions		-2		14.5			14.0		15.8		
Identifies problem behaviors		-1		53.1			53.2		52.8		
Cannot identify		1		29.9			30.4		28.5		
Situational perception	X	-3	1		-0.59	1.22		-0.57	1.22	-0.65	1.22
Selects best time and place		-3		4.2			4.0		4.6		
Chooses skill but not time/place		-2		16.7			16.3		18.0		

Analyzes but unable to choose skill		-1			46.2		46.1		46.5		
Cannot analyze					32.9		33.6		31.0		
Dealing with others	X		-3	1		-0.79	1.08		-0.77	1.08	-0.86 1.08
Often uses advanced skills		-3			2.6		2.4		3.2		
Sometimes uses advanced skills		-2			19.2		18.5		2.4		
Has basic skills, not advanced		-1			55.5		55.9		54.5		
Lacks basic skills		1			22.6		23.2		20.9		
Dealing with difficult situations	X		-2	2		0.65	1.32		0.66	1.31	0.62 1.33
Often uses skills		-2			2.3		2.3		2.5		
Sometimes uses skills		-1			32.1		31.7		33.3		
Rarely uses skills		1			28.9		29.3		27.7		
Lacks skills		2			36.6		36.7		36.4		
Dealing with feelings/emotions	X		-2	2		0.73	1.29		0.74	1.29	0.68 1.31
Often uses skills		-2			2.1		2.1		2.4		
Sometimes uses skills		-1			29.5		29.0		31.0		
Rarely uses skills		1			30.5		30.9		29.2		
Lacks skills		2			37.9		38.1		37.4		
Monitoring of internal triggers	X		-2	2		0.64	1.53		0.65	1.53	0.60 1.54
Actively monitors		-2			3.1		3.0		3.4		
Identifies		-1			41.3		40.9		42.3		
Cannot identify		2			55.6		56.1		54.4		
Monitoring of external triggers	X		-2	2		0.14	1.51		0.15	1.51	0.11 1.51
Actively monitors		-2			4.1		4.0		4.3		
Identifies		-1			56.6		56.5		57.2		
Cannot identify		2			39.3		39.5		38.5		
Control of impulsive behaviors	X		-3	2		0.78	1.66		0.78	1.66	0.76 1.66
No problem		-3			4.7		4.7		4.5		
Uses techniques		-2			3.0		3.0		3.2		
Knows techniques		-1			29.0		28.9		29.5		
Lacks techniques		2			63.3		63.4		62.9		
Control of aggression	X		-3	2		0.05	1.78		0.03	1.79	0.11 1.78
No problem		-3			10.5		10.7		9.8		
Often uses alternatives		-2			9.5		9.7		9.0		
Sometimes uses alternatives		-1			30.0		30.1		29.8		
Rarely uses alternatives		1			14.4		14.5		14.3		
Lacks alternatives		2			35.6		35.1		37.2		

### Appendix III. Principal Component Analysis (PCA) Detailed findings

Principal Component Analysis (PCA) was utilized to identify item groupings within each domain of the PACT for the prediction models. Table 1 provides the model fit information for the PCA models for each domain. Tables 2 through 12 illustrate the results of the PCA for each domain by providing the components extracted with the items that substantially loaded (loadings values of at least 0.600) onto them.

Table 1 – Components Extracted, Items Loaded, and Percent Variance Explained by Domain

Domain	Number of Components Extracted	Number of Items Per Component	Percent Variance Explained
Criminal History	4	--	52%
<i>Component 1</i>		2	18
<i>Component 2</i>		2	15
<i>Component 3</i>		2	10
<i>Component 4</i>		1	8
School	2	--	65%
<i>Component 1</i>		2	51
<i>Component 2</i>		10	14
Use of Free Time	1	--	51%
<i>Component 1</i>		4	51
Employment	3	--	69%
<i>Component 1</i>		5	39
<i>Component 2</i>		2	19
<i>Component 3</i>		1	12
Relationships	2	--	56%
<i>Component 1</i>		4	36
<i>Component 2</i>		3	20
Family	20	--	63%
<i>Component 1</i>		5	10
<i>Component 2</i>		3	8
<i>Component 3</i>		3	5
<i>Component 4</i>		3	4
<i>Component 5</i>		2	4

<i>Component 6</i>		3	3
<i>Component 7</i>		3	3
<i>Component 8</i>		2	3
<i>Component 9</i>		2	3
<i>Component 10</i>		1	2
<i>Component 11</i>		1	2
<i>Component 12</i>		1	2
<i>Component 13</i>		2	2
<i>Component 14</i>		2	2
<i>Component 15</i>		1	2
<i>Component 16</i>		2	2
<i>Component 17</i>		1	2
<i>Component 18</i>		2	2
<i>Component 19</i>		1	2
<i>Component 20</i>		1	2
Alcohol and Drugs	8	--	63%
<i>Component 1</i>		6	26
<i>Component 2</i>		4	9
<i>Component 3</i>		4	6
<i>Component 4</i>		4	6
<i>Component 5</i>		4	5
<i>Component 6</i>		3	4
<i>Component 7</i>		4	4
<i>Component 8</i>		2	3
Mental Health	12	--	61%
<i>Component 1</i>		5	16
<i>Component 2</i>		6	8
<i>Component 3</i>		2	6
<i>Component 4</i>		2	5
<i>Component 5</i>		2	4

<i>Component 6</i>		2	4
<i>Component 7</i>		1	3
<i>Component 8</i>		2	3
<i>Component 9</i>		2	3
<i>Component 10</i>		2	3
<i>Component 11</i>		1	3
<i>Component 12</i>		1	
Attitudes and Behaviors	11	--	78%
<i>Component 1</i>		6	21
<i>Component 2</i>		2	9
<i>Component 3</i>		2	7
<i>Component 4</i>		2	6
<i>Component 5</i>		1	6
<i>Component 6</i>		1	5
<i>Component 7</i>		1	5
<i>Component 8</i>		2	5
<i>Component 9</i>		2	5
<i>Component 10</i>		1	5
<i>Component 11</i>		1	4
Aggression	5	--	53%
<i>Component 1</i>		4	20
<i>Component 2</i>		3	11
<i>Component 3</i>		2	9
<i>Component 4</i>		2	7
<i>Component 5</i>		2	6
Skills	1	--	54%
<i>Component 1</i>		8	54

Table 2 – Criminal History Domain

<i>Component 1</i>	<i>Component 2</i>	<i>Component 3</i>	<i>Component 4</i>
Felony sex referrals	Misdemeanor referrals	Confined detention orders	Weapon referrals

Against person felony referrals	Against person misdemeanor referrals	Failure-to-appear in court warrants	
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Table 3 – School Domain

<i>Component 1</i>	<i>Component 2</i>
History of expulsion	Current school enrollment
Age of first expulsion	Currently believes school is worthwhile
	Currently believes school is encouraging
	Currently involved in school activities
	Youth's conduct in recent term
	Number of current expulsions
	Youth's attendance in recent term
	Youth's academic performance in recent term
	Assessor's belief youth will graduate

Table 4 – Use of Free Time Domain

<i>Component 1</i>
Historical involvement in at least one structured pro-social activity
Historical involvement in at least one unstructured pro-social activity
Current involvement in at least one structured pro-social activity
Current involvement in at least one unstructured pro-social activity

Table 5 – Employment Domain

<i>Component 1</i>	<i>Component 2</i>	<i>Component 3</i>
No history of employment problems	History of employment	History of problems at work
History of at least one positive adult relationships at work	Interest in employment	
Current employment status		
Understanding what it takes to be successfully employed		
Current positive adult relationships at work		

Table 6 – Relationships Domain

<i>Component 1</i>	<i>Component 2</i>
History of anti-social friends	History of positive adult non-family relationships not connected to school or employment
Current friends youth spends time with	Current positive adult non-family relationships not connected to school or employment
Youth admires anti-social friends	Current pro-social ties
Youth resists anti-social friends	

Table 7 – Family Domain

<i>Component 1</i>	<i>Component 2</i>	<i>Component 3</i>	<i>Component 4</i>
Support network for family	History of family members in jail	Mom currently in jail	Youth feels close to no family members
Family provides opportunities for youth to participate in activities and decisions affecting the youth	Currently have family members in jail	Parent problem with alcohol	Youth feels close to family members
Parental supervision		Parent problem with drugs	
Consistent, appropriate punishment for bad behavior			
Consistent, appropriate rewards for behavior			
<i>Component 5</i>	<i>Component 6</i>	<i>Component 7</i>	<i>Component 8</i>
History of siblings in jail	History of out-of-home placement for youth	No parent problems	Living with siblings
Currently have siblings in jail	History of petitions filed	Parent problem with mental health	No sibling problems
		Parent problem with physical health	
<i>Component 9</i>	<i>Component 10</i>	<i>Component 11</i>	<i>Component 12</i>
History of running away or being kicked out	Living with biological dad	Living with grandparents	Youth has been living under adult supervision
Youth has runaway or been kicked out			
<i>Component 13</i>	<i>Component 14</i>	<i>Component 15</i>	<i>Component 16</i>
History of extended family members in jail	Sibling problem with mental health	Living with non-biological mom	Living with short-term partner
Currently have extended family members in jail	Sibling problem with physical health		Living with romantic partner
<i>Component 17</i>	<i>Component 18</i>	<i>Component 19</i>	<i>Component 20</i>
Living transient	Living with family friends	Living with long-term partner	Living alone
	Living with parent's roommate		

Table 8 – Alcohol and Drugs Domain

<i>Component 1</i>	<i>Component 2</i>	<i>Component 3</i>	<i>Component 4</i>
Alcohol has disrupted education	Alcohol currently disrupted education	Currently using alcohol and/or drugs	Current drug use is to get high
Alcohol has caused family conflict	Alcohol currently causes family conflict	Drugs currently disrupt education	Current drug use has led youth to be withdrawn
Alcohol has interfered with keeping pro-social friends	Alcohol currently interferes with keeping pro-social friends	Drugs currently causes family conflict	Past drug use was to get high



Drugs have disrupted education	Alcohol currently contributes to criminal behavior	Drug choice – marijuana	Past drug use has led youth to be withdrawn
Drugs have caused family conflict			
Drugs have interfered with keeping pro-social friends			
<i>Component 5</i>	<i>Component 6</i>	<i>Component 7</i>	<i>Component 8</i>
Past alcohol use was to get high	History of alcohol and/or drug treatment referrals	Alcohol has caused health problems	Drug choice – amphetamines
Past alcohol use has led youth to be withdrawn	History of alcohol and/or drug education classes	Drug use has caused health problems	Drug choice – cocaine
Current alcohol use is to get high	History of participation in alcohol and/or drug treatment	Current alcohol has caused health problems	
Current alcohol use has led youth to be withdrawn		Current drug use has caused health problems	

Table 9 – Mental Health Domain

<i>Component 1</i>	<i>Component 2</i>	<i>Component 3</i>	<i>Component 4</i>
Witness violence at home	History of ADHD medication/treatment	History of sexual abuse by family	History of suicidal ideation
History of anger	Currently has mental health problem	History of sexual abuse by others	Current thoughts of suicide
History of intensive anger	Currently has ADHD medication/treatment		
History of depression	Currently has mental health treatment, not relating to ADHD		
History of trauma	Currently prescribed mental health medication, not relating to ADHD		
	Current mental health problems interfere with working with youth		
<i>Component 5</i>	<i>Component 6</i>	<i>Component 7</i>	<i>Component 8</i>
History of somatic complaints	Experienced physical abuse in a foster home	History of physical abuse by family	Has previously made a suicide attempt
History of intensive somatic complaints	Witnessed physical abuse in a foster home		Has recently made a suicide attempt
<i>Component 9</i>	<i>Component 10</i>	<i>Component 11</i>	<i>Component 12</i>
History of physical by others	Has previously made a suicide plan	Has medical insurance	Currently suicide emotion of hopelessness
Experienced physical abuse with a weapon	Currently has a suicide plan		

Table 10 – Attitudes and Behaviors Domain

<i>Component 1</i>	<i>Component 2</i>	<i>Component 3</i>	<i>Component 4</i>
Level of optimism	Primary crime emotion – confidence	Accepts responsibility for anti-social behavior	Youth is law abiding
Impulsiveness	Primary crime emotion – excited	Minimizes responsibility for anti-social behavior	Youth is proud of anti-social behavior
Belief in controlling anti-social behavior			
Respect for authority			
Respect for other's property			
Youth's belief in successfully meeting condition of court supervision			
<i>Component 5</i>	<i>Component 6</i>	<i>Component 7</i>	<i>Component 8</i>
Believes anti-social behavior is acceptable	Primary crime emotion – indifference	Primary crime purpose – impulse	Primary crime purpose – money
			Primary crime purpose – peer status
<i>Component 9</i>	<i>Component 10</i>	<i>Component 11</i>	
Primary crime purpose – sex	Primary crime purpose – excitement	Primary crime purpose – power	
Primary crime purpose – anger			

Table 11 – Aggression Domain

<i>Component 1</i>	<i>Component 2</i>	<i>Component 3</i>	<i>Component 4</i>
Tolerance for frustration	Reports of violence – deliberately inflicting pain	Reports of sexual violence – aggressive sex	Reports of sexual violence – voyeurism
Hostile interpretation of action and intentions of others in a common, non-confrontational setting	Reports of violence – using/threatening with a weapon	Reports of sexual violence – sex for power	Reports of sexual violence – exposure
Belief in yelling/verbal aggression to resolve disagreement/conflict	Reports of violence – violent destruction of property		
Belief in fighting/physical aggression to resolve disagreement/conflict			
<i>Component 5</i>			
Reports of violence – fire starting			
Reports of violence – animal cruelty			

Table 12 – Skills Domain

<i>Component 1</i>
Consequential thinking
Goal setting
Problem-solving
Situational perception
Dealing with others
Dealing with situations
Dealing with emotions
Monitoring internal triggers

## Appendix IV. Full Assessment Model

		Male					Female				
		Any	Felony	Violent	Property	Drug	Any	Felony	Violent	Property	Drug
	Min	Max									
<b>DOMAIN 1: CRIMINAL HISTORY</b>											
0. Age at time of assessment											
17		4				4					
16		3				3					
15		2				2					
14		1				1					
13 or under		0				0					
1. Age at 1st Offense											
Over 16		0	0	0	0	0	0	0	0	0	0
16		2	2	2	2	1	4	3	3	2	1
15		4	4	4	4	2	8	6	6	4	2
13 to 14		6	6	6	6	3	12	9	9	6	3
Under 13		8	8	8	8	4	16	12	12	8	4
2. Misdemeanor referrals											
None or one		0	0	0	0	0	0	0		0	0
Two		1	2	1	1	1	1	2		1	1
Three or four		2	4	2	2	2	2	4		2	2
Five or more		3	6	3	3	3	3	6		3	3
3. Felony referrals											
None		0	0	0	0	0	0	0	0	0	0
One		2	4	2	2	2	2	4	1	2	2
Two		4	8	4	4	4	4	8	2	4	4
Three or more		6	12	6	6	6	6	12	3	6	6
4. Weapon referrals											
None		0	0	0		0	0	0	0		0
One or more		1	1	1		1	1	1	3		1
5. Against-person misdemeanor referrals											
None				0					0		
One				2					3		
Two or more				4					6		
6. Against-person felony referrals											
None				0					0		
One or two				4					6		
Three or more				8					12		
9. Disposition orders where youth served at least one day confined in detention											
None		0	0	0	0	0	0	0	0	0	0
One		3	2	1	1	1	3	1	1	1	1
Two		6	4	2	2	2	6	2	2	2	2
Three or more		9	6	3	3	3	9	3	3	3	3
10. Disposition orders where youth served at least one day confined under JRA											
None		0	0	0	0	0	0	0	0	0	0
One		6	4	2	2	2	6	2	2	2	2
Two or more		9	8	4	4	4	12	4	4	4	4
11. Escapes											
None		0	0	0	0	0	0	0	0	0	0
One		1	2	1	1	1	1	1	1	1	1
Two or more		2	4	2	2	2	2	2	2	2	2
12. Failure-to-appear in court warrants											
None		0	0	0	0	0	0	0	0	0	0
One		1	2	1	1	1	1	1	1	1	1
Two or more		2	4	2	2	2	2	2	2	2	2
<b>DOMAIN 3: SCHOOL</b>											

1h. Youth is a special education student or has a formal diagnosis of a special education need (select all that apply)										
No Special Education	1	1	1	1	1	1	1	1	1	1
Behavior	3	2	1			2	2	3	2	
ADHD	1	1	2		1	1	1	1		1
Learning	1				1	1		3		
2c. Youth's current school enrollment status, regardless of attendance										
Graduated/GED/full-time	-4	-2	-2	-4		-2	-2	-4	-2	
Enrolled part-time	-2	-1	-1	-2		-1	-1	-2	-1	
Suspended, dropped-out or expelled	6	3	3	6		3	3	6	3	
3h. Age at first expulsion or suspension										
No expulsions	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
5 to 9 years old	2	2	2	2	2	2	2	2	2	2
10 to 13 years old	2	2	2	2	2	2	2	2	2	2
14 to 15 years old	1	1	1	1	1	1	1	1	1	1
16 to 18 years old	1	1	1	1	1	1	1	1	1	1
<b>EXPULSIONS &amp; CONDUCT SCALE</b>	-1	3								
2h. History of expulsions and suspensions since the first grade										
No expel/suspend	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
One expel/suspend	1	1	1	1	1	1	1	1	1	1
Two or more	2	2	2	2	2	2	2	2	2	2
8c. Number of expulsions and suspensions in the most recent term										
No expel/suspend	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
One expel/suspend	1	1	1	1	1	1	1	1	1	1
Two or three	2	2	2	2	2	2	2	2	2	2
Over three	3	3	3	3	3	3	3	3	3	3
7c. Youth's conduct in the most recent term										
Recognition for good school behavior	-1	-1	-1	-2	-2	-2	-2	-2	-2	-2
No problems	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
School problems reported by teachers	1	1	1	1	1	1	1	1	1	1
School problem calls to parents	2	2	2	2	2	2	2	2	2	2
School problem calls to police	3	3	3	3	3	3	3	3	3	3
<b>BELIEVE, ENCOURAGE, &amp; STAFF SCALE</b>	-4	4								
3c. Youth believes there is value in getting an education										
Believes	-1	-1		-1						-1
Somewhat believes	1	1		1						1
Does not believe	2	2		2						2
4c. Youth believes school provides an encouraging environment for him or her										
Believes	-1	-1		-1		-1				-1
Somewhat believes	1	1		1		1				1
Does not believe	2	2		2		2				2
5c. Teachers, staff, or coaches the youth likes or										

feels comfortable talking with									
None	0	0	0	0	0	0	0	0	0
One	-1	-1	-1	-1	-1	-1	-1	-1	-1
Two or more	-2	-2	-2	-2	-2	-2	-2	-2	-2
<b>ASSESSMENT STAY, ATTENDANCE, ACADEMIC SCALE</b>									
6c. Youth's involvement in school activities during most recent term	-6	8							
Two or more	-2	-2	-2	-2	-2	-2	-2	-2	-2
One	-1	-1	-1	-1	-1	-1	-1	-1	-1
Not involved but interested	1	1	1	1	1	1	1	1	1
Not interested	2	2	2	2	2	2	2	2	2
9c. Youth's attendance in the most recent term									
Good attendance; few excused absences	-2	-2	-2	-2	-2	-2	-2	-2	-2
No unexcused absences	-1	-1	-1	-1	-1	-1	-1	-1	-1
Some partial-day unexcused absences	1	1	1	1	1	1	1	1	1
Some full-day unexcused absences	2	2	2	2	2	2	2	2	2
Truancy or withdrawn	3	3	3	3	3	3	3	3	3
10c. Youth's academic performance in the most recent school term									
Mostly As	-3	-3	-3	-3	-3	-3	-3	-3	-3
Mostly As and Bs	-2	-2	-2	-2	-2	-2	-2	-2	-2
Mostly Bs and Cs, no Fs	-1	-1	-1	-1	-1	-1	-1	-1	-1
Mostly Cs and Ds, some Fs	1	1	1	1	1	1	1	1	1
Some Ds and mostly Fs	2	2	2	2	2	2	2	2	2
11c. Interviewer's assessment of likelihood the youth will stay in and graduate from high school or an equivalent vocational school									
Very likely	-1	-1	-1	-1	-1	-1	-1	-1	-1
Uncertain	1	1	1	1	1	1	1	1	1
Not likely	2	2	2	2	2	2	2	2	2
<b>DOMAIN 4: FREE TIME</b>									
<b>CURRENT STRUCTURED &amp; UNSTRUCTURED ACTIVITIES SCALE</b>	-4	0							
Current interest and involvement in structured recreational activities									
Two or more	-3	-3	-3	-3	-3	-3	-3	-3	-3
One	-2	-2	-2	-2	-2	-2	-2	-2	-2
Interested but not involved	-1	-1	-1	-1	-1	-1	-1	-1	-1
Not interested	0	0	0	0	0	0	0	0	0
Current interest and involvement in unstructured recreational activities									
Two or more	-3	-3	-3	-3	-3	-3	-3	-3	-3
One	-2	-2	-2	-2	-2	-2	-2	-2	-2
Interested but not involved	-1	-1	-1	-1	-1	-1	-1	-1	-1
Not interested	0	0	0	0	0	0	0	0	0
<b>DOMAIN 5: EMPLOYMENT</b>									

2h. History of successful employment										
Never successfully employed	0		0	0	0			0		0
Has been successfully employed	-2		-1	-1	-1			-1		-1
3h. History of problems while employed										
Never fired or quit			0	0						
Fired or quit: poor performance			1	1						
Fired or quit: not getting along			2	2						
<b>HISTORY &amp; CURRENT EMPLOYMENT RELATIONSHIPS &amp; UNDERSTANDING SCALE</b>	-5	0								
4h. History of positive personal relationship(s) with past employer(s) or adult coworker(s)										
None	0	0	0	0	0	0	0	0	0	0
One	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
Two or more	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2
4c. Current positive personal relationship(s) with employer(s) or adult coworker(s)										
Not currently employed/currently employed & no positive relationships	0	0	0	0	0	0	0	0	0	0
One or more	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
1c. Understanding of what is required to maintain a job										
Lacks knowledge to maintain job	0	0	0	0	0	0	0	0	0	0
Has knowledge to maintain job	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
Has demonstrated maintaining job	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2
2c. Current interest in employment										
Currently employed										-3
Highly interested										-2
Somewhat interested										-1
Not interested or too young for employment										0
3c. Current employment status										
Employment going well		-1		-1						
Not employed		0		0						
Problems with employment		1		1						
<b>DOMAIN 6: RELATIONSHIP HISTORY &amp; CURRENT RELATIONSHIPS WITH ADULTS SCALE</b>	-6	0								
1h. History of positive adult non-family relationships not connected to school or employment										
None									0	

One											-1
Two											-2
Three or more											-3
2h. Current positive adult non-family relationships not connected to school or employment											
None											0
One											-1
Two											-2
Three or more											-3
HISTORY & CURRENT RELATIONSHIPS WITH PROSOCIAL ONLY FRIENDS											
HISTORY & CURRENT RELATIONSHIPS WITH NONE/MIX OF PRO & ANTISOCIAL FRIENDS											
HISTORY & CURRENT RELATIONSHIPS WITH ANTISOCIAL ONLY FRIENDS											
HISTORY & CURRENT RELATIONSHIPS WITH GANG MEMBER FRIENDS											
2h. History of anti-social friends/companions (select all that apply)											
Only pro-social friends			-1							1	
Never had consistent friends or mix of pro-social and anti-social friends			1			1	1	1			1
Only anti-social friends						2			2	1	
Gang member/associate	3	3	3				3	3	3	3	
2-3c. Current anti-social friends/companions											
Only pro-social friends			-1							1	
No consistent friends or mix of pro-social and anti-social friends			1			1	1	1			1
Only anti-social friends						2			2	1	
Gang member/associate	3	3	3				3	3	3	3	
4c. Currently in a "romantic," intimate, or sexual relationship											
Romantically involved: pro-social person			-1			-1			-1		
Not romantically involved			0			0			0		
Romantically involved: anti-social person			1			1			1		
ADMIRE & EMULATES											
5c. Currently admires/emulates anti-social peers											
Does not admire	-2	-1	-1	-1	-1	-1	-1	-1	-1	-1	
Somewhat admires	2	1	1	1	1	1	1	1	1	1	
Admires	4	2	2	2	2	2	2	2	2	2	
6c. Current resistance to anti-social peer influence											
Does not associate with	-4	-2	-2	-2	-2	-2	-2	-2	-2	-2	



Usually resists	-2	-1	-1	-1	-1	-1	-1	-1	-1	-1
Rarely resists	2	1	1	1	1	1	1	1	1	1
Leads anti-social peers	4	2	2	2	2	2	2	2	2	2
<b>DOMAIN 7: FAMILY</b>										
<b>HISTORY &amp; CURRENT FAMILY CONFLICT, RUNAWAYS, &amp; PARENTAL CONTROL SCALE</b>	-4	10								
2h. History of running away or getting kicked out of home										
No history										
One instance										
Two or more instances										
9c. Youth has run away or been kicked out of home										
No run away/kicked out										
Runaway/kicked out										
Currently a runaway/kicked out										
11c. Level of conflict between parents, between youth and parents, among siblings										
Some family conflict: well managed										
Family verbal intimidation, arguments										
Family threats of physical abuse										
Domestic violence: physical/sexual abuse										
13c. Parental authority and control										
Usually follows family rules										
Sometimes follows family rules										
Consistently disobeys family										
Hostile toward family										
<b>HISTORY OF OUT-OF-HOME PLACEMENTS, PETITIONS, &amp; LIVING IN FOSTER HOME SCALES</b>	-1	5								
1h. History of court-ordered or DSHS voluntary out-of-home and shelter care placements exceeding 30 days										
None	-1	-1	-1	-1		-1	-1	-1	-1	
One	1	1	1	1		1	1	1	1	
Two	2	2	2	2		2	2	2	2	
Three or more	3	3	3	3		3	3	3	3	
3h. History of petitions filed										
None	-1	-1	-1	-1		-1	-1	-1	-1	
One	1	1	1	1		1	1	1	1	
Two or more	1	1	1	1		1	1	1	1	
5h. Youth has been living under any "adult supervision"										
No	2	2	1	1	1	2	1	1	1	2
Yes	-2	-2	-1	-1	-1	-2	-1	-1	-1	-2

<b>4h-3c. HISTORY OF CURRENT FAMILY MEMBERS IN JAIL/PRISON (select all that apply)</b>										
Mother/female caretaker history	1	1	1	1	1	1	1	1	1	1
Father/male caretaker history	1	1	1	1	1	1	1	1	1	1
Sibling history	1	1	1	1	1	1	1	1	1	1
Current mother/female caretaker	1	1	1	1	1	1	1	1	1	1
Current father/male caretaker	1	1	1	1	1	1	1	1	1	1
Current sibling	1	1	1	1	1	1	1	1	1	1
Current other family member	1	1	1	1	1	1	1	1	1	1
<b>1c. YOUTH IS CURRENTLY LIVING WITH (PROTECTIVE, select all that apply)</b>										
Alone	-2	-1	-1	-1	-1	-1	-1	-1	-1	-1
Mother	-4	-2	-2	-2	-1	-3	-1	-1	-2	-1
Father	-4	-2	-2	-2	-1	-3	-1	-1	-2	-1
Sibling	-4	-2	-2	-2	-1	-3	-1	-1	-2	-1
Grandparent	-2	-1	-1	-1	-1	-1	-1	-1	-1	-1
<b>1c. YOUTH IS CURRENTLY LIVING WITH (RISK, select all that apply)</b>										
Transient	2	4	3	1	1	1	1	2	2	1
Foster/group home	2	4	3	1	1	1	1	2	2	1
<b>5c. PROBLEM HISTORY OF SIBLINGS CURRENTLY INVOLVED WITH THE HOUSEHOLD (select all that apply)</b>										
No siblings, none in household, or no problem	-1							-2		
Current sibling alcohol problem						1			1	
Current sibling drug problem						1			1	
Current sibling mental health problem						1			1	
Current sibling physical health problem						1			1	
Current sibling employment problem						1			1	
<b>6c. Support network for family</b>										
No family support										
Some family support										
Strong family support						-1				-1
<b>2c. Annual combined income of youth and family</b>										
Under \$15,000						-2				-2
\$15,000 to \$34,999										
\$35,000 to \$49,999										
\$50,000 and over										
<b>4c. PROBLEM HISTORY OF PARENTS INVOLVED WITH THE HOUSEHOLD (select all that apply)</b>										

None										
Alcohol problem										
Drug problem						1				1
Mental health problem										
Physical health problem										
Employment problem										
<b>10c. FAMILY MEMBER(S) YOUTH FEELS CLOSE TO OR HAS GOOD RELATIONSHIP WITH (select all that apply)</b>										
None	1	1	1	1	1	1	1	1	1	1
Mother/female caretaker	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
Father/male caretaker	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
Sibling	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
Extended family	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
16c. Parental characterization of youth's anti-social behavior										
Disapproves of										1
Minimizes/excuses										-1
Okay with										-2
Proud of										-3
<b>DOMAIN 8: SUBSTANCE ABUSE</b>										
<b>1h-1c. HISTORY &amp; CURRENT ALCOHOL USE</b>										
Past alcohol use	1						1			
Current alcohol use	2						2			
<b>2h-2c. HISTORY &amp; CURRENT DRUG USE</b>										
Past drug use	3	1		2	2	2	1		1	1
Current drug use	6	2		4	4	4	2		2	2
<b>2h-2c. DRUG ISSUES SCALE</b>										
History and current alcohol/drug contribution to criminal behavior										
Past alcohol use contributed to criminal behavior	1					1	2		1	1
Past drug use contributed to criminal behavior	1					1	2		1	1
Alcohol contributes to criminal behavior	2					2	4		2	2
Drug contributes to criminal behavior	2					2	4	1	2	2
History and current alcohol/drug contribution to getting high/withdrawal										
Past alcohol use contributed to getting high/withdrawal		2		2	2		2		3	1
Past drug use contributed to getting high/withdrawal		2		2	2		2		3	1
Alcohol contributes to getting high/withdrawal		4		4	4		4		6	2
Drug contributes to getting high/withdrawal		4		4	4		4		6	2
History and current alcohol/drug contribution to education issues										
Past alcohol use						1				1

contributed to education issues										
Past drug use contributed to education issues						1				1
Alcohol contributes to education issues						2				2
Drug contributes to education issues						2		1		2
History and current alcohol/drug contribution to family conflict										
Past alcohol use contributed to family conflict						1		1		1
Past drug use contributed to family conflict						1		1		1
Alcohol contributes to family conflict						2		2		2
Drug contributes to family conflict						2		2		2
History and current alcohol/drug interferes with pro-social friendships										
Past alcohol use interferes with pro-social friendships										
Past drug use interferes with pro-social friendships										
Alcohol interferes with pro-social friendships										
Drug interferes with pro-social friendships								1		1
History and current alcohol/drug interferes with health										
Past alcohol use interferes with health										
Past drug use interferes with health										
Alcohol interferes with health										
Drug interferes with health								1		1
<b>3c. TYPE OF DRUGS CURRENTLY USED (select all that apply)</b>	0	3								
Marijuana/hashish	1			1	2	2			1	1
Amphetamines	1	1	1	1	1	6	1	1	1	1
Cocaine	1	1	1	1	1	6	1	1	1	1
Heroin	1	1		1	1	6	1		1	1
Other drugs	1	1		1	1	6	1		1	1
<b>HISTORY &amp; CURRENT REFERRALS &amp; TREATMENT FOR DRUG/ALCOHOL SCALE</b>										
3h. History of referrals for drug/alcohol assessment										
Never referred	0				0	0				0
Diagnosed: no drug/alcohol problem	0				0	0				0
Referred but not assessed for drug/alcohol	1				1	1				1
Diagnosed drug/alcohol abuse	2				2	2				2

Diagnosed drug/alcohol dependency	3			3	3				3
4h. History of attending alcohol/drug education classes for an alcohol/drug problem									
Never attended	0			0	0				0
Voluntarily attended	-3			-3	-3				-3
Parent, school directed	-2			-2	-2				-2
Court directed	-1			-1	-1				-1
5h. History of participating in alcohol/drug treatment program									
Never participated	0			0	0				0
Participated once	-1			-1	-1				-1
Participated several times	-1			-1	-1				-1
No known issue	-2			-2	-2				-2
4c. Alcohol/drug treatment program participation									
Treatment not warranted	0	0	0	0	0	0	0	0	0
Currently needs	1	1	1	1	1	1	1	1	1
Currently attending	-1	-1	-1	-1	-1	-1	-1	-1	-1
Successfully completed	-2	-2	-2	-2	-2	-2	-2	-2	-2
No known issue	-3	-3	-3	-3	-3	-3	-3	-3	-3
<b>DOMAIN 9: MENTAL HEALTH</b>									
<b>2h. HISTORY OF PHYSICAL ABUSE (select all that apply)</b>									
Physically abused by family member			1					1	
Physically abused foster home			1					1	3
Physically abuse with weapon		2	2					1	
<b>3h. HISTORY OF SEXUAL ABUSE (select all that apply)</b>									
Not a victim of sexual abuse									
Sexually abused by family member		1	1	1					
Sexually abused: outside the family									
History of being a victim of neglect			1					1	
4h. History of ADD/ADHD									
No history	-1	-1	-1	-2	-1	-1	-2	-1	-1
Diagnosed	1	1	1	2	1	1	2	1	1
ADD/ADHD medication prescribed	1	1	1	2	1	1	2	1	1
ADD/ADHD treatment prescribed	1	1	1	2	1	1	2	1	1
ADD/ADHD medication and treatment prescribed	2	2	2	4	2	2	4	2	2
<b>HISTORY OF WITNESSING VIOLENCE (select all that apply)</b>									
Has not witnessed	-5	-2	-2	-1	-1			-1	
Witnessed violence at home									

Witnessed violence in community										
Witnessed violence at foster home	10	5	6	9	1			2		
<b>MENTAL HEALTH ISSUE (select all that apply)</b>										
Anger/intensive anger			2					4	1	1
Depression										
Somatic complaints										
2c. Currently diagnosed with ADD/ADHD										
Taking ADD/ADHD medication	-1				-1	-1	-1		-1	
No ADD/ADHD diagnosis, no ADD/ADHD medication	0				0	0	0		0	
ADD/ADHD medication prescribed, but not taking	1				1	1	1		1	
7h. Health insurance										
No	0	0	0	0	0	0	0	0	0	0
Yes	-1	-2	-1	-1	-1	-1	-1	-1	-1	-1
1c. Current suicide ideation										
Recent serious thoughts of suicide										
No recent thoughts of suicide			1		1					
Recently planned suicide			3					1		
Recently attempted suicide			4							
<b>MENTAL HEALTH PROBLEMS</b>	-6	4								
6h. History of mental health problems			0			0	0	0		
No history			1			1	1	1		
Diagnosed with mental health problem(s)			1			1	1	1		
Mental health medication prescribed			1			1	1	1		
Mental health treatment prescribed			2			2	2	2		
Mental health medication and treatment prescribed										
8h. Current mental health problem status			-4			-4	-4	-4		
No current mental health problem(s)			0			0	0	0		
Current mental health problem(s)										
3c. Mental health treatment currently prescribed, excluding ADD/ADHD treatment			-1			-1	-1	-1		
Attending mental health treatment			0			0	0	0		
No current mental health problem or no mental health treatment currently prescribed			1			1	1	1		
Mental health treatment prescribed but not attending										
4c. Mental health medication prescribed, excluding ADD/ADHD			-1			-1	-1	-1		

Taking mental health medication	0				0	0	0	0		
No mental health problem or no mental health medication currently prescribed	1				1	1	1	1		
Mental health medication prescribed but not taking	0				0	0	0	0		
<b>DOMAIN 10: ATTITUDES/BEHAVIOR OR BELIEF ITEMS</b>										
	-10	21								
1. Primary emotion when committing last crime(s) within the last 6 months (select all that apply)										
Unconcerned/indifferent	-1				-1					
Nervous, afraid, worried, uncertain	-1				-1					
Excited, or stimulated	3	1	2	1	1	2	1	1	1	1
Confident/bragging	3	1	2	1	1	2	1	1	1	1
2. Primary purpose for committing crime(s) within the last 6 months (select all that apply)										
Anger	3	1	2	1	1	2	1	1	1	1
Revenge	3	1	2	1	3	2	1	1	1	1
Impulse	3	1	2	1	1	2	1	1	1	1
Sexual desire										
Money, material gain, drugs	3	1	2	1	1	2	1	1	1	1
Excitement, amusement	3	1	2	1	1	2	1	1	1	1
Status, acceptance, attention	3	1	2	1	2	2	1	1	1	1
3. Optimism										
High aspirations: sense of purpose, commitment to better life	-2			-2	-2	-2	-2	-2	-2	-2
Normal aspirations: some sense of purpose	1			1	1	1	1	1	1	1
Low aspirations: little sense of purpose or plans for better	1			1	1	1	1	1	1	1
Believes nothing matters: he or she will be dead before long	2			2	2	2	2	2	2	2
4. Impulsive; acts before thinking										
Uses self-control: usually thinks before acting	-2			-2		-2	-2	-2	-2	
Uses some self-control: sometimes thinks before acting	1			1		1	1	1	1	
Impulsive: often acts before thinking	1			1		1	1	1	1	
Highly impulsive: usually acts before thinking	2			2		2	2	2	2	
5. Belief in control over antisocial behavior										
Believes can stop anti-social behavior	-1			-1		-1	-1	-1	-1	
Somewhat believes can stop anti-social behavior	0			0		0	0	0	0	
Believes cannot stop anti-social behavior	1			1		1	1	1	1	
6. Empathy, remorse, sympathy, or feelings for the victim(s) of criminal behavior										

Has empathy	-1	-1	-1	-1	-1	-1
Has some empathy	0	0	0	0	0	0
Does not have empathy	1	1	1	1	1	1
7. Respect for property of others						
Respects property of others	-1	-1	-1	-1	-1	-1
Respects personal, not publicly accessible, property	1	1	1	1	1	1
Conditional respect for personal property:	1	1	1	1	1	1
No respect for personal/public property	2	2	2	2	2	2
8. Respect for authority figures						
Respects most authority figures	-1	-1	-1	-1	-1	-1
Does not respect authority figures	1	1	1	1	1	1
Resents most authority figures	2	2	2	2	2	2
Defies/hostile toward most authority figures	3	3	3	3	3	3
9. Attitude toward pro-social rules/conventions in society						
Believes pro-social rules apply	-1	-1	-1	-1	-1	-1
Believes pro-social rules sometimes apply	1	1	1	1	1	1
Does not believe pro-social rules apply	2	2	2	2	2	2
Resents or is defiant toward rules	3	3	3	3	3	3
11. Youth's belief in successfully meeting conditions of court supervision						
Believes will be successful under supervision	-1	-1	-1	-1	-1	-1
Unsure of success under supervision	0	0	0	0	0	0
Does not believe will be successful under supervision	1	1	1	1	1	1
10. Accepts responsibility for anti-social behavior (select all that apply)						
Accepts responsibility	-1	-1	-1	-1	-1	-1
<b>RESPONSIBILITY SCALE</b>						
Minimizes, denies, justifies, excuses, or blames others for own behavior	1	1	1	1		
Accepts own anti-social behavior okay	1	1	1	1		
Proud of own anti-social behavior	1	1	1	1		
<b>DOMAIN 11: AGGRESSION</b>						
<b>AGGRESSION BELIEFS</b>						
1. Tolerance for frustration	-5	8				
Rarely gets upset/temper tantrums	-1	-3	-1	-1		



Sometimes gets upset/temper tantrums	1	3			1		1		
Often gets upset/temper tantrums	2	6			2		2		
2. Hostile interpretation of actions and intentions of others in a common non - confrontational setting									
Primarily positive view	-1	-3			-1		-1		
Primarily negative view	1	3			1		1		
Primarily hostile view	2	6			2		2		
3. Belief in yelling and verbal aggression to resolve a disagreement or conflict									
Believes verbal aggression is rarely appropriate	-1	-3			-1		-1		
Believes verbal aggression is sometimes appropriate	1	3			1		1		
Believes verbal aggression is often appropriate	2	6			2		2		
4. Belief in fighting and physical aggression to resolve a disagreement or conflict									
Believes physical aggression is never appropriate	-2	-2	-6		-2	-2	-2		
Believes physical aggression is rarely appropriate	-1	-1	3		-1	-1	-1		
Believes physical aggression is sometimes appropriate	1	1	3		1	1	1		
Believes physical aggression is often appropriate	2	2	6		2	2	2		
<b>5. REPORTS OR EVIDENCE OF VIOLENCE NOT INCLUDED IN CRIMINAL HISTORY (select all that apply)</b>									
Violent destruction of property	1	2	1		1	1	2		
Violent outbursts, displays of temper, uncontrolled anger indicating potential for harm	1	2	1		1	1	2		
Deliberately inflicted physical pain	1	2	1		1	1	2		
Used/threatened with a weapon	1	2	4		1	1	2		
Fire starting reports	1	2	1	5	1	1	2	3	1
Animal cruelty reports	1	2	1	1	1	1	2	1	1
<b>6. REPORTS/EVIDENCE OF SEXUAL AGGRESSION NOT INCLUDED IN CRIMINAL HISTORY</b>									
No reports	-3	-1	-3	-3	-2	-4	-3	-3	-1
Reports of aggressive sex	3	1	3	3	2	4	3	3	1
Reports of sex for power	3	1	3	3	2	4	3	3	1
Reports of child sex	3	1	3	3	2	4	3	3	1
Reports of voyeurism	3	1	3	3	2	4	3	3	1
Reports of exposure	3	1	3	3	2	4	3	3	1
<b>DOMAIN 12: SKILLS</b>									

SKILLS DOMAIN	-28	15									
1. Consequential thinking											
Does not understand about consequences of actions	1	1	1	1	1	1	1	1	1	1	1
Understands about consequences to actions	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
Identifies consequences of actions	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2
Good consequential thinking and acting	-3	-3	-3	-3	-3	-3	-3	-3	-3	-3	-3
2. Goal setting											
Does not set any goals	2	2	2	2	2	2	2	2	2	2	2
Sets unrealistic goals	1	1	1	1	1	1	1	1	1	1	1
Sets somewhat realistic goals	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
Sets realistic goals	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2
3. Problem-solving											
Cannot identify problem behaviors	1	1	1	1	1	1	1	1	1	1	1
Identifies problem behaviors	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
Thinks of solutions for problem behaviors	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2
Applies appropriate solutions to problem behaviors	-3	-3	-3	-3	-3	-3	-3	-3	-3	-3	-3
4. Situational perception											
Cannot analyze the situation for use of a prosocial skill	1	1	1	1	1	1	1	1	1	1	1
Does not choose the best pro-social skill	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
Chooses best skill but not best time and place	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2
Selects the best time and place for best skill	-3	-3	-3	-3	-3	-3	-3	-3	-3	-3	-3
5. Dealing with others											
Lacks basic social skills in dealing with others	1	1	1	1	1	1	1	1	1	1	1
Lacks advanced skills in dealing with others	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
Sometimes uses advanced social skills in dealing with others	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2
Often uses advanced social skills in dealing with others	-3	-3	-3	-3	-3	-3	-3	-3	-3	-3	-3
6. Dealing with difficult situations											
Lacks skills in dealing with difficult situations	2	2	2	2	2	2	2	2	2	2	2
Rarely uses skills in dealing with difficult situations	1	1	1	1	1	1	1	1	1	1	1
Sometimes uses skills in dealing with difficult situations	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
Often uses skills in dealing with difficult situations	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2
7. Dealing with feelings/emotions											
Lacks skills in dealing with feelings	2	2	2	2	2	2	2	2	2	2	2
Rarely uses skills in dealing with feelings	1	1	1	1	1	1	1	1	1	1	1
Sometimes uses skills in dealing with feelings	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1

Often uses skills in dealing with feelings	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2
8. Monitoring of internal triggers										
Cannot identify internal triggers	1	1	1	1	1	1	1	1	1	1
Identifies internal triggers	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
Actively monitors/controls internal triggers	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2
9. Monitoring of external triggers										
Cannot identify external triggers	1	1	1	1	1	1	1	1	1	1
Identifies external triggers	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
Actively monitors/controls external triggers	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2
10. Control of impulsive behaviors that get youth into trouble										
Never a problem with impulsive behavior	-3	-3	-3	-3	-3	-3	-3	-3	-3	-3
Lacks techniques to control impulsive behavior	1	1	1	1	1	1	1	1	1	1
Knows techniques to control impulsive behavior	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
Uses techniques to control impulsive behavior	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2
11. Control of aggression										
Never a problem with aggression	-3	-3	-3	-3	-3	-3	-3	-3	-3	-3
Lacks alternatives to aggression	2	2	2	2	2	2	2	2	2	2
Rarely uses alternatives to aggression	1	1	1	1	1	1	1	1	1	1
Sometimes uses alternatives to aggression	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
Often uses alternatives to aggression	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2

### Full Assessment Modeling Results

	Male					Female				
	Any	Felony	Violent	Property	Drug	Any	Felony	Violent	Property	Drug
<b>MODEL AUC</b>	0.67	0.68	0.67	0.66	0.65	0.64	0.67	0.7	0.64	0.67
<b>CURRENT AUC</b>	0.63					0.60				
<b>CUT POINT</b>										
Low-Moderate	-33					-28				
Moderate-High	22	23	15	15	12	60	55	47	40	40
<b>POPULATION %</b>										
Low	3					3				
Moderate										
High	50	50	50	49	50	17	8	12	14	14
<b>RECIDIVISM %</b>										
Low	19					20				
Moderate										
High	64	31	29	38	11	59	24	30	32	8
<b>GENDER-NEUTRAL BASE RATE</b>	34	16	14	19	5	34	16	14	19	5

## Appendix V. Construct Validity (EFA and CFA)

The literature suggests that the construct validity of the criminogenic needs of most of the existing RNA instruments has not been fully established (Mei, 2018), in part due to the lack of dynamic items in the construction of the risk/needs assessment tools (Hamilton et al, 2016; Viglione, Rudes, & Taxman, 2014). Additionally, validation studies adhering to the industry standards and protocols have not been conducted (Mei, 2018). In order to validate the construct validity of criminogenic needs assessed by an RNA tool, each of the following performance criteria must be supported: (1) evidence on internal latent structure; (2) convergent/discriminate validity; (3) concurrent and predictive validity; and (4) content validity (Hayens, 1995; Rios & Wells, 2014; American Educational Research Association [AERA]; American Psychological Association [APA]; National Council on Measurement in Education [NCME], 2014). The purpose of the analyses presented here is to establish the construct validity of the criminogenic needs assessed by the PACT. Specifically, we examined its internal latent structure and convergent/divergent validity via rigorous psychometric analyses.

### Sample

To evaluate the construct validity of the PACT, we utilized a total sample of 45,975 juveniles from Washington State. These youths' risk and needs were assessed between December 10<sup>th</sup>, 2003 and June 30<sup>th</sup>, 2017. The sample includes 34,220 males and 11,755 females.

### Method

To evaluate the construct validity of the criminogenic needs assessed by the PACT, this study utilizes a series of statistical tests to examine all of the objective sub-types of construct validity, including: (1) evidence of an internal latent structure; (2) convergent and discriminate validity; and (3) concurrent and predictive validity. The content validity will not be directly evaluated because it requires Subject-Matter-Experts (SMEs) direct and subjective input (Sireci & Faulkner-Bond, 2014). The analyses will be conducted within the framework of Structural Equation Modeling (SEM). When testing the statistical relationships among each of manifest items, analyses will be conducted within the theoretical framework of Item Factor Analysis (IFA) or Item Response Theory (IRT), as the items are categorical in nature. Although IFA and IRT are considered independent theoretical frameworks, there are no substantial differences between them (Thomas, 2011). When testing the statistical relationships among the composite scores or scales, analyses will be conducted within the theoretical framework of Classical Test Theory ([CTT]; Spearman, 1904; Zimmerman, 1975; Lord & Novick, 1968; Steyer & Eid, 2001) due to the continuous nature of the composite scores.

#### *(a) Internal Latent Structure*

The internal latent structure validity of an RNA is established when the proposed independent measures of the constructs are identified, confirmed and supported by empirical evidence. The internal latent structure validity involves three aspects: dimensionality; measurement invariance; and reliability (Rios & Wells, 2014).

##### ***1. Internal Latent Structure – Dimensionality***

The most common method to establish dimensionality validity is through a CFA (DeVellis, 2003). For constructs that have multiple dimensions/domains, a Second/Higher Order Modeling approach is the most acceptable method to confirm a construct's multi-dimensionality (Rios & Wells, 2014; Mei et al., 2017; Mei et al., 2018). A CFA is generally used to confirm the proposed or hypothesized number of factors. The higher order modeling approach is utilized to extract a higher order factor that explains common variance

among lower level factors (Chen, Sousa & West, 2005; Geiser, 2012; Little, 2013; Mei et al., 2017; Mei et al., 2018b).

## **2. Internal Latent Structure - Measurement Invariance**

Measurement invariance represents a lack of systematic assessment bias based on items' functionality and one's group membership (Mei, 2018). A RNA's measurement invariance can be established at item level for lower level factors and scale level for higher order factors (Mei, 2018). For scale level invariance, the measurement invariance concerns whether or not the measurement lacks systematic bias across different assessment groups. In this study, gender is used as the group membership because of concerns regarding misclassification of female offenders (Berman, 2005; Bloom, Owen, & Covington, 2003; Van Voorhis & Presser, 2001). If a higher order factor model is retained, then the statistical equivalence of the factor loadings is further tested. To assess item and scale invariance, Multiple Group Confirmatory Factor Analysis ([MGCFA]; Rios & Wells, 2014) is used. MGCFA takes advantage of the CFA and group membership, enabling researchers to evaluate dimensionality and measurement invariance in unified statistical models (Mei, 2018).

## **3. Internal Latent Structure - Scale Reliability**

Scale reliability (construct reliability) concerns the internal consistency of the proposed measures. When evaluating scale reliability, Cronbach's alpha is used to evaluate scales that passed the item invariance tests (Mei, 2018). Cronbach's alpha coefficient is only considered a fair estimate of a scale's internal consistency when a scale passed metric level invariance, is tau-equivalent, or is parallel (Cortina, 1993; John & Soto, 2007; Peters, 2014; Raykov, 2001a; Raykov, 2001b; Sijtsma, 2009; Tavakol & Dennick, 2011). If these conditions are not met, the *ω* reliability coefficient (Revelle & Zinbarg, 2009; Joreskog, 1971; Dillon & Goldstein, 1984) is the preferred construct reliability estimator, as it does not assume item invariance for a congeneric non-parallel scale.

## **4. Internal Latent Structure - Global Risk-Needs Factor (G-Factor)**

Similar to most RNA instruments, the PACT assumes that there is an objective and global criminogenic need that could be measured by estimating each assessment domain/construct. Before testing the Global Criminogenic Needs Factor, the weighted composite scores of each assessment construct will be used as indicators in the final model. This procedure allows researchers to use only the true score variance of these constructs given the fact that most of the constructs are multi-dimensional in nature. The unweighted scores contain both true score variance and factors disturbance. The weighted composite allows researchers to exact only the reliable proportion of total variance of a given factor so that the unbiased statistical relationships among the confirmed constructs can be fairly estimated (Mei, 2018).

### **(b) Convergent/Divergent Validity**

While the convergent validity test evaluates how well theoretically related items or scales converge with one another, the divergent validity test assesses how much theoretically unrelated items or scales discriminate (e.g. differ) from one another. Convergent and divergent validity can be established at both the item and scale level. The PACT contains eight domains and proposes to represent eleven distinguishable criminogenic needs. By first conducting convergent/divergent validity tests at the item level, this study will empirically test whether the proposed domains stand as independent constructs. Convergent and divergent validity will further be examined at the scale level once the internal latent structure is confirmed through MGCFA.

The most acceptable and available method to test convergent and divergent validity is with an EFA (Brown, 2014; Mei, 2018). To test the convergent and divergent validity of the items, we break the PACT

items into five groups. Instead of analyzing all of the items and their convergent and divergent validity in one EFA model, this procedure enables us to obtain the convergent and divergent validity much more efficiently while also maintaining statistical integrity. EFA analyses will be conducted on each of the 10 possible group combinations amongst the five groups. At the scale level, the EFA will be conducted to test the level of convergence and divergence amongst the scales once their dimensionality is confirmed. Based on the EFA evidence, we will further test the legitimacy of exacting a higher order factor through MGCFA with structural and measurement invariance tests. A higher order factor will only be retained if the higher order factor does not contribute to detrimental model fit and if it does not fail measurement invariance tests at factor level.

## **Analytical Strategy**

When testing the internal latent structure of the PACT, this study will utilize MGCFA analyses and associated statistical criteria to evaluate dimensionality, measurement invariance and construct reliability. Once the internal latent structure of the PACT is confirmed and measurement invariance is achieved, the CFA analysis will be used to test the hypothesized higher order G-factor true score variance model. This study will also use the industry statistical criteria and acceptable standards when evaluating CFA or MGCFA models (e.g. the CFI, TLI, RMSEA, and associated rules to examine the fit of IRT/IFA models). A model has an acceptable fit if the CFI/TLI is greater than 0.90 and the RMSEA is less than 0.08 (Brown, 2014; Little, 2013; Want & Wang, 2012). The fit is close or good if the CFI/TLI is greater than 0.95 and the RMSEA is less than 0.05. To evaluate measurement invariance, the measurement invariance model will be compared to previous models via changes in the CFI and TLI values (see Little, 2013).

Scale reliability will be estimated according to the level of measurement a factor achieved. Both Cronbach's alpha and the *ω* coefficient will be calculated to assess reliability. When evaluating the G-Factor model, this study will follow the procedure proposed by Mei (2018, p.91). This approach enables researchers to establish a parsimonious model in which multidimensional/higher order factors' true score variance is used. The EFA tests will be used to evaluate the convergent and divergent validity of the PACT at both the item and scale level. Although there are multiple available EFA model evaluation criteria, this study will only use Kaiser-Guttman rule, goodness of fit, strength of the loading/cross-loading, and theory as foundation to facilitate the model evaluation process, as suggested by Mei (2018).

## **Results**

First, we examine convergence and divergence of PACT items. Item(s) may be relocated to other scales according to EFA results. Once the convergent and divergent validity is established at the item level, MGCFA will be conducted to confirm the PACT's internal latent structure. We then use an EFA to evaluate convergence and divergence at the scale level, and results from this analysis is then used to inform higher order modeling. Once the higher order factors are identified and confirmed, their composite scores and construct reliability will be assessed. Finally, the G-factor model will be evaluated by using the true/reliable score variance as indicators.

### ***Convergent/Divergent Validity at Item Level***

The EFA analyses were conducted on all ten possible group combinations. Group 1 contains domain 3, 4, 5 and 6. Group 2 only contains domain 7, while Group 3 only consists of domain 8. Group 4 contains domain 9 and 10. Group 5 involves domains 11, 12 and 13. The results of the EFA analyses at the item level are presented in Tables 1 through 11. Table 1 provides the best model solution for each group combination while subsequent tables display factor loadings.

Table 1. EFA on Group Combinations

Groups	Model	df	CFI	TLI	RMSEA [90% C.I.]
1 & 2	9 factors	397	.997	.995	.031 [.031-.031]
1 & 3	10 factors	486	.994	.989	.034 [.033-.034]
1 & 4	8 factors	427	.997	.996	.030 [.029-.030]
1 & 5	7 factors	489	.996	.994	.037 [.036-.037]
2 & 3	9 factors	342	.993	.988	.023 [.022-.023]
2 & 4	6 factors	319	.966	.948	.032 [.032-.032]
2 & 5	7 factors	318	.986	.977	.033 [.033-.033]
3 & 4	6 factors	429	.990	.985	.025 [.025-.026]
3 & 5	7 factors	428	.987	.979	.038 [.037-.038]
4 & 5	5 factors	373	.981	.973	.036 [.036-.037]

Table 2 EFA on Group 1 (D3 D4 D5 D6) + Group 2 (D7)

Item	Var Name	F1	F2	F3	F4	F5	F6	F7	F8	F9
Enrollment	D3B1AN	.891								
Involvement	D3B6N	.746								
Attendance	D3B3A1	.949								
Value in Eid	D3B4N	.935								
Encourage	D3B5N	.665								
Staff Comfort	D3B7N	.645	.564							
Conduct	D3B8N	.749	.538							
Suspend/Expel	D3B9N	.770								
Performance	D3B10N	.721								
Assess Stay	D3B11N	.808								
Structured Activity	D4B1N			.889						
Type of Structured Activity	D4B2N			1.016						
Unstructured Activity	D4B3N			--						
Understand Job Maintain	D5B1N				.759					
Current Interest	D5B2N				.918					
Employment Status	D5B3N				--					
Positive Adult	D6B1N					.720				
Community Ties	D6B2N					.658				
Friends/ Companions	D6B3N						.671			
Romantic Relationship	D6B4N						--			
Admires/ Emulates	D6B5N						.865			
Resistance to Anti-social	D6B6N						.817			
Annual Income	D7B1N							.324		
Risk 'Living With' Relationship	D7B2N							.473		
Family Jail/ Prison	D7B3N								.763	
Parent Problem	D7B4N								.745	
Sibling Problem	D7B5N								.435	
Support Network	D7B6N							.593		
Willing to Support	D7B7N							.867		
Opportunities for Family Activities	D7B8N							.791		
Run away/ Kicked out	D7B9N									.474
Family Member Relationships	D7B10N							.320		
Level of Family Conflict	D7B11N									.713
Parental Supervision	D7B12N							.736		
Parental Authority	D7B13							.477		.352
Consistent Punishment	D7B14N							.568		
Consistent Rewards	D7B15N							.754		
Parental Characterization Youth's Behavior	D7B16N							.427		

As shown in Table 1, a nine-factor solution represented the best model for Groups 1 and 2. The corresponding factor loadings for this model are moderate to strong (see Table 2). Accordingly, there is divergent validity at the item level for domains 3, 4, 5, 6 and 7. Convergent validity is also demonstrated by within domain loadings with the exception of the 'Unstructured Activity', 'Employment Status' and 'Romantic Relationship' items. These three items did not load onto their theoretically hypothesized domains.

Table 3 EFA on Group 1 (D3 D4 D5 D6) + Group 3 (D8)

Item	Var Name	F1	F2	F3	F4	F5	F6	F7	F8	F9	F10
<i>Enrollment</i>	<i>D3B1A1N</i>	.837									
<i>Involvement</i>	<i>D3B6N</i>	.685									
<i>Attendance</i>	<i>D3B3A1</i>	.918									
<i>Value in Ed</i>	<i>D3B4N</i>	.899									
<i>Encourage</i>	<i>D3B5N</i>	.532									
<i>Staff Comfort</i>	<i>D3B7N</i>	.685	.546								
<i>Conduct</i>	<i>D3B8N</i>	.785	.560								
<i>Suspend/ Expel</i>	<i>D3B9N</i>	.722									
<i>Performance</i>	<i>D3B10N</i>	.695									
<i>Assess Stay</i>	<i>D3B11N</i>	.798									
<i>Structured Activity</i>	<i>D4B1N</i>			.984							
<i>Type of Structured Activity</i>	<i>D4B2N</i>			.953							
<i>Unstructured Activity</i>	<i>D4B3N</i>			--							
<i>Understand Job Maintain</i>	<i>D5B1N</i>				.776						
<i>Current Interest</i>	<i>D5B2N</i>				.923						
<i>Employment Status</i>	<i>D5B3N</i>				--						
<i>Positive Adult</i>	<i>D6B1N</i>					.734					
<i>Community Ties</i>	<i>D6B2N</i>					.585					
<i>Friends/ Companions</i>	<i>D6B3N</i>						.597				
<i>Romantic Relationship</i>	<i>D6B4N</i>						--				
<i>Admires/ Emulates</i>	<i>D6B5N</i>						.860				
<i>Resistance to Anti-social</i>	<i>D6B6N</i>						.792				
<i>Marijuana Use</i>	<i>D8B3_1</i>							1.008			
<i>Meth use</i>	<i>D8B3_2</i>									.644	
<i>Cocaine/ Crack Use</i>	<i>D8B3_3</i>									.627	
<i>Heroin/ Opiate Use</i>	<i>D8B3_4</i>									.682	
<i>Other Drug Use</i>	<i>D8B3_5</i>									.475	
<i>Alcohol Disrupts Ed</i>	<i>D8B1_2</i>								.912		
<i>Alcohol Family Conflict</i>	<i>D8B1_3</i>								.925		
<i>Alcohol Interferes Pro-Social Friends</i>	<i>D8B1_4</i>								.874		
<i>Alcohol Use Health Problems</i>	<i>D8B1_5</i>								.931		
<i>Alcohol Contributes Criminal Behavior</i>	<i>D8B1_6</i>								.876		
<i>Alcohol Tolerance</i>	<i>D8B1_7</i>								.622	.642	
<i>Alcohol Withdrawal</i>	<i>D8B1_8</i>								.641	.632	
<i>Drug Disrupts Ed</i>	<i>D8B2_2</i>						.563	.392			
<i>Drug Family Conflict</i>	<i>D8B2_3</i>						.575	.103			
<i>Drug Interferes Pro-Social Friends</i>	<i>D8B2_4</i>						.572	.408			
<i>Drug Use Health Problems</i>	<i>D8B2_5</i>							.462	.517		
<i>Drug Contributes Criminal Behavior</i>	<i>D8B2_6</i>						.487	.314			
<i>Drug Tolerance</i>	<i>D8B2_7</i>						.340			.711	
<i>Drug Withdrawal</i>	<i>D8B2_8</i>						.547			.781	
<i>Treatment</i>	<i>D8B4</i>						.708				

A 10-factor solution represented the best fit for the combination of Groups 1 and 3. As shown in Table 3, there are no cross-loading across the domains; thus, divergent validity at the item level is present for domain 3, 4, 5, 6, and 8. Convergent validity for most of the items is substantiated with the exception of: 'Unstructured Activity'; 'Employment Status'; and 'Romantic Relationship'. These items did not load onto their proposed domains.



Table 4 EFA on Group 1 (D3 D4 D5 D6) + Group 4 (D9 D10)

Item	Var Name	F1	F2	F3	F4	F5	F6	F7	F8
<i>Enrollment</i>	<i>D3B1A1N</i>	.957							
<i>Involvement</i>	<i>D3B6N</i>	.747							
<i>Attendance</i>	<i>D3B3A1</i>	.934							
<i>Value in Ed</i>	<i>D3B4N</i>	.920							
<i>Encourage</i>	<i>D3B5N</i>	.569							
<i>Staff Comfort</i>	<i>D3B7N</i>	.803	.536						
<i>Conduct</i>	<i>D3B8N</i>	.915	.556						
<i>Suspend/Expel</i>	<i>D3B9N</i>	.808							
<i>Performance</i>	<i>D3B10N</i>	.740							
<i>Assess Stay</i>	<i>D3B11N</i>	.803							
<i>Structured Activity</i>	<i>D4B1N</i>			.798					
<i>Type of Structured Activity</i>	<i>D4B2N</i>			1.096					
<i>Unstructured Activity</i>	<i>D4B3N</i>			--					
<i>Understand Job Maintain</i>	<i>D5B1N</i>				.784				
<i>Current Interest</i>	<i>D5B2N</i>				.760				
<i>Employment Status</i>	<i>D5B3N</i>				--				
<i>Positive Adult</i>	<i>D6B1N</i>					.769			
<i>Community Ties</i>	<i>D6B2N</i>					.732			
<i>Friends/ Companions</i>	<i>D6B3N</i>						.573		
<i>Romantic Relationship</i>	<i>D6B4N</i>						--		
<i>Admires/Emulates</i>	<i>D6B5N</i>						.710		
<i>Resistance to Anti-social</i>	<i>D6B6N</i>						.707		
<i>Suicide Ideation</i>	<i>D9B1_8N</i>							.694	
<i>ADD/ADHD</i>	<i>D9B2N</i>							.709	
<i>Treatment</i>	<i>D9B3N</i>							.926	
<i>Medication</i>	<i>D9B4N</i>							.923	
<i>MHI Issue Interfere Working with Youth</i>	<i>D9B5N</i>							.816	
<i>Primary Criminal Emotion</i>	<i>D10.A1N</i>								.310
<i>Primary Criminal Purpose</i>	<i>D10.A2N</i>								--
<i>Optimism</i>	<i>D10.A3N</i>								.418
<i>Impulsive</i>	<i>D10.A4N</i>								.494
<i>Belief in Control Actions</i>	<i>D10.A5N</i>								.615
<i>Empathy</i>	<i>D10.A6N</i>								.652
<i>Respect Property</i>	<i>D10.A7N</i>								.788
<i>Respect Authority</i>	<i>D10.A8N</i>								.605
<i>Pro-Social Conventions</i>	<i>D10.A9N</i>								.758
<i>Accepts Responsibility</i>	<i>D10.A10N</i>								.535
<i>Belief in Success</i>	<i>D10.A11N</i>								.801

We retained an eight-factor solution for Groups 1 and 4. Table 4 shows that the eight-factor solution has no cross-loadings. Divergent validity is supported by a clear pattern of cross-loadings. Convergent validity for most items is supported by their within domain loadings. The ‘Unstructured Activity’, ‘Employment Status’, ‘Romantic Relationship’, and ‘Primary Criminal Purpose’, items have questionable convergent validity, as they did not load onto their corresponding domains.

Table 5 EFA on Group 1 (D3 D4 D5 D6) + Group 5 (D11 D12)

Item	Var Name	F1	F2	F3	F4	F5	F6	F7
<i>Enrollment</i>	<i>D3B1AN</i>	.951						
<i>Involvement</i>	<i>D3B6N</i>	.737						
<i>Attendance</i>	<i>D3B3A1</i>	.945						
<i>Value in Eid</i>	<i>D3B4N</i>	.937						
<i>Encourage</i>	<i>D3B5N</i>	.611						
<i>Staff Comfort</i>	<i>D3B7N</i>	.821	.539					
<i>Conduct</i>	<i>D3B8N</i>	.925	.517					
<i>Suspend/ Expel</i>	<i>D3B9N</i>	.795						
<i>Performance</i>	<i>D3B10N</i>	.723						
<i>Assess Stay</i>	<i>D3B11N</i>	.796						
<i>Structured Activity</i>	<i>D4B1N</i>			.990				
<i>Type of Structured Activity</i>	<i>D4B2N</i>			.974				
<i>Unstructured Activity</i>	<i>D4B3N</i>			--				
<i>Understand Job Maintain</i>	<i>D5B1N</i>				.872			
<i>Current Interest</i>	<i>D5B2N</i>				.762			
<i>Employment Status</i>	<i>D5B3N</i>				--			
<i>Positive Adult</i>	<i>D6B1N</i>				.484			
<i>Community Ties</i>	<i>D6B2N</i>				.446			
<i>Friends/ Companions</i>	<i>D6B3N</i>					.669		
<i>Romantic Relationship</i>	<i>D6B4N</i>					--		
<i>Admires/ Emulates</i>	<i>D6B5N</i>					.848		
<i>Resistance to Anti-social</i>	<i>D6B6N</i>					.826		
<i>Frustration Tolerance</i>	<i>D11A1N</i>						.717	
<i>Hostile Perception</i>	<i>D11A2N</i>						.523	
<i>Belief in Yelling</i>	<i>D11A3N</i>						.901	
<i>Belief in Fighting</i>	<i>D11A4N</i>						.871	
<i>Violent Events Reported</i>	<i>D11A5N</i>						.730	
<i>Control Sexual Aggression</i>	<i>D11A6N</i>						--	
<i>Consequential Thinking</i>	<i>D12A1N</i>							.809
<i>Goal Setting</i>	<i>D12A2N</i>							.533
<i>Problem Solving</i>	<i>D12A3N</i>							.945
<i>Situational Perception</i>	<i>D12A4N</i>							.904
<i>Dealing with Others</i>	<i>D12A5N</i>							.888
<i>Difficult Situations</i>	<i>D12A6N</i>							.899
<i>Dealing with Emotions</i>	<i>D12A7N</i>							.884
<i>Internal Triggers</i>	<i>D12A8N</i>							1.049
<i>External Triggers</i>	<i>D12A9N</i>							1.022
<i>Control Impulses</i>	<i>D12A10N</i>							.553
<i>Control Aggression</i>	<i>D12A11N</i>							--

A seven-factor solution was retained for Groups 1 and 5. Divergent and convergent validity is evident for many of the items; however, several items lack validity (see Table 5). These items include: ‘Unstructured Activity’; ‘Employment Status’; ‘Romantic Relationship’; ‘Control Sexual Aggression’; and ‘Control Aggression’. These items’ within domain loadings are weak and negligible.

Table 6 EFA on Group 2 (D7) + Group 3 (D8)

Item	Var Name	F1	F2	F3	F4	F5	F6	F7	F8	F9
<i>Annual Income</i>	D7B1N	.252								
<i>Risk 'Living With' Relationship</i>	D7B2N	.335						.491		
<i>Family Jail/ Prison</i>	D7B3N		.738							
<i>Parent Problem</i>	D7B4N		.745							
<i>Sibling Problem</i>	D7B5N		.419							
<i>Support Network</i>	D7B6N	.623								
<i>Willing to Support</i>	D7B7N	.526								
<i>Opportunities for Family Activities</i>	D7B8N	.739								
<i>Run away/ kicked out</i>	D7B9N				.485					
<i>Family Member Relationships</i>	D7B10N	.444			.341					
<i>Level of Family Conflict</i>	D7B11N		.366		.693					
<i>Parental Supervision</i>	D7B12N			.721						
<i>Parental Authority</i>	D7B13			.393	.392					
<i>Consistent Punishment</i>	D7B14N			.794						
<i>Consistent Rewards</i>	D7B15N			.650						
<i>Parental Characterization Youth's Behavior</i>	D7B16N			.559						
<i>Marijuana Use</i>	D8B3_1					1.071				
<i>Meth use</i>	D8B3_2					.626			.498	
<i>Cocaine/ Crack Use</i>	D8B3_3					.612			.510	
<i>Heroin/ Opiate Use</i>	D8B3_4					.575			.420	
<i>Other Drug Use</i>	D8B3_5					.552			.321	
<i>Alcohol Disrupts Ed</i>	D8B1_2						.955			
<i>Alcohol Family Conflict</i>	D8B1_3						.968			
<i>Alcohol Interferes Pro-Social Friends</i>	D8B1_4						.973			
<i>Alcohol Use Health Problems</i>	D8B1_5						.860			.396
<i>Alcohol Contributes Criminal Behavior</i>	D8B1_6						.985			
<i>Alcohol Tolerance</i>	D8B1_7						.610	.636		
<i>Alcohol Withdrawal</i>	D8B1_8						.551	.562		
<i>Drug Disrupts Ed</i>	D8B2_2				.631	.444				
<i>Drug Family Conflict</i>	D8B2_3				.620	.419				
<i>Drug Interferes Pro-Social Friends</i>	D8B2_4				.567	.472				
<i>Drug Use Health Problems</i>	D8B2_5				.357	.512				
<i>Drug Contributes Criminal Behavior</i>	D8B2_6				.630	.403				.457
<i>Drug Tolerance</i>	D8B2_7				.493			.721		
<i>Drug Withdrawal</i>	D8B2_8				.543			.617		
<i>Treatment</i>	D8B4				.678					

For Groups 2 and 3, a nine-factor solution was retained. As shown in Table 6, there is a clear factorial pattern, and only one item (the risk 'Living With' Relationship from domain 7) cross-loaded onto a factor in domain 8. Otherwise, the convergent and divergent validity of most of the items is supported.

Table 7 EFA on Group 2 (D7) + Group 4 (D9 D10)

Item	Var Name	F1	F2	F3	F4	F5	F6
<i>Annual Income</i>	<i>D7B1N</i>						
<i>Risk 'Living With' Relationship</i>	<i>D7B2N</i>	.501					
<i>Family Jail/ Prison</i>	<i>D7B3N</i>		.756				
<i>Parent Problem</i>	<i>D7B4N</i>		.747				
<i>Sibling Problem</i>	<i>D7B5N</i>		.426				
<i>Support Network</i>	<i>D7B6N</i>	.563			.358		
<i>Willing to Support</i>	<i>D7B7N</i>	.863					
<i>Opportunities for Family Activities</i>	<i>D7B8N</i>	.770			.364		
<i>Run away/kicked out</i>	<i>D7B9N</i>			.399			
<i>Family Member Relationships</i>	<i>D7B10N</i>			--			
<i>Level of Family Conflict</i>	<i>D7B11N</i>			.693			
<i>Parental Supervision</i>	<i>D7B12N</i>	.843					
<i>Parental Authority</i>	<i>D7B13</i>	.628					
<i>Consistent Punishment</i>	<i>D7B14N</i>	.661					
<i>Consistent Rewards</i>	<i>D7B15N</i>	.807					
<i>Parental Characterization Youth's Behavior</i>	<i>D7B16N</i>	.382					
<i>Suicide Ideation</i>	<i>D9B1_8N</i>					.612	
<i>ADD/ ADHD</i>	<i>D9B2N</i>					.738	
<i>Treatment</i>	<i>D9B3N</i>					.918	
<i>Medication</i>	<i>D9B4N</i>					.908	
<i>MH Issue Interfere Working with Youth</i>	<i>D9B5N</i>					.832	
<i>Primary Criminal Emotion</i>	<i>D10.A1N</i>						.360
<i>Primary Criminal Purpose</i>	<i>D10.A2N</i>						--
<i>Optimism</i>	<i>D10.A3N</i>						.696
<i>Impulsive</i>	<i>D10.A4N</i>						.660
<i>Belief in Control Actions</i>	<i>D10.A5N</i>						.759
<i>Empathy</i>	<i>D10.A6N</i>						.806
<i>Respect Property</i>	<i>D10.A7N</i>						.786
<i>Respect Authority</i>	<i>D10.A8N</i>						.852
<i>Pro-Social Conventions</i>	<i>D10.A9N</i>						.768
<i>Accepts Responsibility</i>	<i>D10.A10N</i>						.503
<i>Belief in Success</i>	<i>D10.A11N</i>						.760

A six-factor solution was obtained for Groups 2 and 4. Most of the items demonstrated divergent validity among domains 7, 9 and 10. There are a few items whose convergent validity was not supported by the EFA results, as they did not load onto any of the factors within their domains. These items are 'Annual Income', 'Family Member Relationships' and 'Primary Criminal Purpose'. The convergent and divergent validity for these items needs to be tested further.

Table 8 EFA on Group 12 (D7) + Group 5 (D11 D12)

Item	Var Name	F1	F2	F3	F4	F5	F6	F7
<i>Annual Income</i>	<i>D7B1N</i>	.332						
<i>Risk 'Living With' Relationship</i>	<i>D7B2N</i>	.388						
<i>Family Jail/ Prison</i>	<i>D7B3N</i>		.751					
<i>Parent Problem</i>	<i>D7B4N</i>		.731					
<i>Sibling Problem</i>	<i>D7B5N</i>		.411					
<i>.Support Network</i>	<i>D7B6N</i>	.639						
<i>Willing to Support</i>	<i>D7B7N</i>	.611			.388			
<i>Opportunities for Family Activities</i>	<i>D7B8N</i>	.774						
<i>Run away/ kicked out</i>	<i>D7B9N</i>			.371				
<i>Family Member Relationships</i>	<i>D7B10N</i>	.456						
<i>Level of Family Conflict</i>	<i>D7B11N</i>	--		.411		.467		
<i>Parental Supervision</i>	<i>D7B12N</i>	.304			.696			
<i>Parental Authority</i>	<i>D7B13</i>				.404	.326		
<i>Consistent Punishment</i>	<i>D7B14N</i>				.750			
<i>Consistent Rewards</i>	<i>D7B15N</i>	.338				.566		
<i>Parental Characterization Youth's Behavior</i>	<i>D7B16N</i>				.485			
<i>Frustration Tolerance</i>	<i>D11A1N</i>					.669		
<i>Hostile Perception</i>	<i>D11A2N</i>					.515		
<i>Belief in Yelling</i>	<i>D11A3N</i>					.923		
<i>Belief in Fighting</i>	<i>D11A4N</i>					.929		
<i>Violent Events Reported</i>	<i>D11A5N</i>					.715		
<i>Control Sexual Aggression</i>	<i>D11A6N</i>					--		
<i>Consequential Thinking</i>	<i>D12A1N</i>						.772	
<i>Goal Setting</i>	<i>D12A2N</i>						.631	
<i>Problem Solving</i>	<i>D12A3N</i>						.887	
<i>Situational Perception</i>	<i>D12A4N</i>						.928	
<i>Dealing with Others</i>	<i>D12A5N</i>						.956	
<i>Difficult Situations</i>	<i>D12A6N</i>						.940	
<i>Dealing with Emotions</i>	<i>D12A7N</i>						.899	
<i>Internal Triggers</i>	<i>D12A8N</i>						.740	.507
<i>External Triggers</i>	<i>D12A9N</i>						.739	.466
<i>Control Impulses</i>	<i>D12A10N</i>						.574	
<i>Control Aggression</i>	<i>D12A11N</i>					.553		

A seven-factor solution for Groups 2 and 5 was retained. Similar to the above results, the convergent and divergent validity of most items was supported (see Table 8). However, 'Level of Family Conflict' and 'Parental Authority' from domain 7 cross-loaded onto the factor in domain 11 while loading on two factors in their own domain. The item for 'Control Aggression' from domain 12 loaded onto domain 11 instead of domain 12. This evidence may suggest the relocation of 'Control Aggression' from domain 12 to domain 11.

Table 9 EFA on Group 3 (D8) + Group 4 (D9 D10)

Item	Var Name	F1	F2	F3	F4	F5	F6
<i>Marijuana Use</i>	<i>D8B3_1</i>	.991					
<i>Meth use</i>	<i>D8B3_2</i>	.856					
<i>Cocaine/ Crack Use</i>	<i>D8B3_3</i>	.911					
<i>Heroin/ Opiate Use</i>	<i>D8B3_4</i>	.836					
<i>Other Drug Use</i>	<i>D8B3_5</i>	.718					
<i>Alcohol Disrupts Ed</i>	<i>D8B1_2</i>		.954				
<i>Alcohol Family Conflict</i>	<i>D8B1_3</i>		.974				
<i>Alcohol Interferes Pro-Social Friends</i>	<i>D8B1_4</i>		.973				
<i>Alcohol Use Health Problems</i>	<i>D8B1_5</i>		.885		.350		
<i>Alcohol Contributes Criminal Behavior</i>	<i>D8B1_6</i>		.979				
<i>Alcohol Tolerance</i>	<i>D8B1_7</i>		.601	.630			
<i>Alcohol Withdrawal</i>	<i>D8B1_8</i>		.486	.622			
<i>Drug Disrupts Ed</i>	<i>D8B2_2</i>	.467	.550				
<i>Drug Family Conflict</i>	<i>D8B2_3</i>	.481	.541				
<i>Drug Interferes Pro-Social Friends</i>	<i>D8B2_4</i>	.430	.556				
<i>Drug Use Health Problems</i>	<i>D8B2_5</i>		.626		.356		
<i>Drug Contributes Criminal Behavior</i>	<i>D8B2_6</i>	.499	.499				
<i>Drug Tolerance</i>	<i>D8B2_7</i>		.457	.668			
<i>Drug Withdrawal</i>	<i>D8B2_8</i>		.397	.759			
<i>Treatment</i>	<i>D8B4</i>	.759					
<i>Suicide Ideation</i>	<i>D9B1_8N</i>					.654	
<i>ADD/ ADHD</i>	<i>D9B2N</i>					.737	
<i>Treatment</i>	<i>D9B3N</i>					.925	
<i>Medication</i>	<i>D9B4N</i>					.913	
<i>MH Issue Interfere Working with Youth</i>	<i>D9B5N</i>					.782	
<i>Primary Criminal Emotion</i>	<i>D10.A1N</i>						.316
<i>Primary Criminal Purpose</i>	<i>D10.A2N</i>						.598
<i>Optimism</i>	<i>D10.A3N</i>						.624
<i>Impulsive</i>	<i>D10.A4N</i>						.657
<i>Belief in Control Actions</i>	<i>D10.A5N</i>				.437		.676
<i>Empathy</i>	<i>D10.A6N</i>						.790
<i>Respect Property</i>	<i>D10.A7N</i>						.706
<i>Respect Authority</i>	<i>D10.A8N</i>						.783
<i>Pro-Social Conventions</i>	<i>D10.A9N</i>						.495
<i>Accepts Responsibility</i>	<i>D10.A10N</i>						.726
<i>Belief in Success</i>	<i>D10.A11N</i>				.472		.676

For Groups 3 and 4, a six-factor solution was retained. As presented in Table 9, most of the items from domains 8, 9 and 10 demonstrated convergent and divergent validity at the item level. There are four items, including ‘Alcohol Use Health Problems’, ‘Drug Use Health Problems’, ‘Belief in Control Actions’ and ‘Belief in Success’, that loaded onto their own proposed domains *and* converged on a new factor (F4). However, their cross-loadings were weak (.350, .356, .437 and .472) compared to their own factor loadings (.885, .626, .676 and .676). Given the strong loading and relatively weak cross-loading, this evidence may only suggest correlated residuals among these items.

Table 10 EFA on Group 3 (D8) + Group 5 (D11 D12)

Item	Var Name	F1	F2	F3	F4	F5	F6	F7
<i>Marijuana Use</i>	<i>D8B3_1</i>	1.032						
<i>Meth use</i>	<i>D8B3_2</i>	.737						
<i>Cocaine/ Crack Use</i>	<i>D8B3_3</i>	.699						.343
<i>Heroin/ Opiate Use</i>	<i>D8B3_4</i>	.721						
<i>Other Drug Use</i>	<i>D8B3_5</i>	.600						
<i>Alcohol Disrupts Ed</i>	<i>D8B1_2</i>		.905					
<i>Alcohol Family Conflict</i>	<i>D8B1_3</i>		.917					
<i>Alcohol Interferes Pro-Social Friends</i>	<i>D8B1_4</i>		.894					
<i>Alcohol Use Health Problems</i>	<i>D8B1_5</i>		.897		.473			
<i>Alcohol Contributes Criminal Behavior</i>	<i>D8B1_6</i>		.888					
<i>Alcohol Tolerance</i>	<i>D8B1_7</i>		.628	.632				
<i>Alcohol Withdrawal</i>	<i>D8B1_8</i>		.628	.613				
<i>Drug Disrupts Ed</i>	<i>D8B2_2</i>	.635	.379					
<i>Drug Family Conflict</i>	<i>D8B2_3</i>	.626	.381					
<i>Drug Interferes Pro-Social Friends</i>	<i>D8B2_4</i>	.582	.391					
<i>Drug Use Health Problems</i>	<i>D8B2_5</i>	.388	.422		.427			
<i>Drug Contributes Criminal Behavior</i>	<i>D8B2_6</i>	.642	.309					
<i>Drug Tolerance</i>	<i>D8B2_7</i>	.557		.666				
<i>Drug Withdrawal</i>	<i>D8B2_8</i>	.561		.751				
<i>Treatment</i>	<i>D8B4</i>	.737						
<i>Frustration Tolerance</i>	<i>D11.A1N</i>					.659		
<i>Hostile Perception</i>	<i>D11.A2N</i>					.522		
<i>Belief in Yelling</i>	<i>D11.A3N</i>					.880		
<i>Belief in Fighting</i>	<i>D11.A4N</i>					.862		
<i>Violent Events Reported</i>	<i>D11.A5N</i>					.625		
<i>Control Sexual Aggression</i>	<i>D11.A6N</i>					--		
<i>Consequential Thinking</i>	<i>D12.A1N</i>						.735	
<i>Goal Setting</i>	<i>D12.A2N</i>						.623	
<i>Problem Solving</i>	<i>D12.A3N</i>						.883	
<i>Situational Perception</i>	<i>D12.A4N</i>						.894	
<i>Dealing with Others</i>	<i>D12.A5N</i>						.881	
<i>Difficult Situations</i>	<i>D12.A6N</i>				.386		.893	
<i>Dealing with Emotions</i>	<i>D12.A7N</i>				.365		.863	
<i>Internal Triggers</i>	<i>D12.A8N</i>						.902	.465
<i>External Triggers</i>	<i>D12.A9N</i>						.887	.405
<i>Control Impulses</i>	<i>D12.A10N</i>						.585	
<i>Control Aggression</i>	<i>D12.A11N</i>					.538		

A seven-factor solution was retained for Groups 3 and 5. As presented in Table 10, most of the items loaded onto factors within their own domains, demonstrating convergent and divergent validity at the item level. Yet, 'Heroin/Opiate Use' and 'Internal Triggers' and 'External Triggers' cross-loaded onto a new factor (F7) while also loading onto factors within their own domains. The cross-loadings are relatively weak (.343, .465 and .405) compared to their loadings (.699, .902 and .887). In a similar vein, 'Alcohol Use Health Problems' and 'Drug Use Health Problems' from domain 8 and 'Difficult Situations' and 'Dealing with Emotions' from domain 12 cross-loaded on a new factor while loaded onto the factors within their own domains. These cross-loadings (.473, .427, .386 and .365) are, again, relatively weak compared to their loadings (.897, .422, .893 and .863). Therefore, with weak cross-loadings, exacting a new factor may be meaningless.

Table 11 EFA on Group 4 (D9 D10) + Group 5 (D11 D12)

Item	Var Name	F1	F2	F3	F4	F5
<i>Suicide Ideation</i>	<i>D9B1_8N</i>	.664				
<i>ADD/ADHD</i>	<i>D9B2N</i>	.740				
<i>Treatment</i>	<i>D9B3N</i>	.939				
<i>Medication</i>	<i>D9B4N</i>	.932				
<i>MH Issue Interfere Working with Youth</i>	<i>D9B5N</i>	.797				
<i>Primary Criminal Emotion</i>	<i>D10.A1N</i>		.414			
<i>Primary Criminal Purpose</i>	<i>D10.A2N</i>		--			
<i>Optimism</i>	<i>D10.A3N</i>		.726			
<i>Impulsive</i>	<i>D10.A4N</i>		.384			
<i>Belief in Control Actions</i>	<i>D10.A5N</i>		.591			
<i>Empathy</i>	<i>D10.A6N</i>		.812			
<i>Respect Property</i>	<i>D10.A7N</i>		.664			
<i>Respect Authority</i>	<i>D10.A8N</i>		.678			
<i>Pro-Social Conventions</i>	<i>D10.A9N</i>		.761			
<i>Accepts Responsibility</i>	<i>D10.A10N</i>		.464			
<i>Belief in Success</i>	<i>D10.A11N</i>		.700			
<i>Frustration Tolerance</i>	<i>D11.A1N</i>			.549		
<i>Hostile Perception</i>	<i>D11.A2N</i>		.569	.323		
<i>Belief in Yelling</i>	<i>D11.A3N</i>			.830		
<i>Belief in Fighting</i>	<i>D11.A4N</i>			.860		
<i>Violent Events Reported</i>	<i>D11.A5N</i>			.622		
<i>Control Sexual Aggression</i>	<i>D11.A6N</i>			--		
<i>Consequential Thinking</i>	<i>D12.A1N</i>				.801	
<i>Goal Setting</i>	<i>D12.A2N</i>		.473		.522	
<i>Problem Solving</i>	<i>D12.A3N</i>				.928	
<i>Situational Perception</i>	<i>D12.A4N</i>				.924	
<i>Dealing with Others</i>	<i>D12.A5N</i>				.922	
<i>Difficult Situations</i>	<i>D12.A6N</i>				.919	
<i>Dealing with Emotions</i>	<i>D12.A7N</i>				.890	
<i>Internal Triggers</i>	<i>D12.A8N</i>				.924	.398
<i>External Triggers</i>	<i>D12.A9N</i>				.909	.372
<i>Control Impulses</i>	<i>D12.A10N</i>				.606	
<i>Control Aggression</i>	<i>D12.A11N</i>			.529		

As shown in Table 1, the EFA results suggested a five-factor solution for Groups 4 and 5. However, the ‘Primary Criminal Purpose’ and ‘Control Sexual Aggression’ items did not load onto any of the factors across the four domains. The item ‘Hostile Perception’ from domain 11 cross-loaded onto factor F2 in domain 10. Because its cross-loadings (.569) is stronger than its loading (.323), this item will be relocated to domain 10, where its dimensionality will be further examined via a MGCFA analysis. The findings also suggested that ‘Control Aggression’ be relocated from domain 12 to domain 11. Yet, this item also cross-loaded on factor F2 in domain 10 while loading onto factor F4 in domain 12. This evidence suggests retaining this item within domain 12 because of its relatively weak loading (.473) and relatively strong loading (.522). Now that convergent and divergent validity have been examined, we move next to the internal latent structure.

### ***Internal latent Structure***

After examining the evidence of the convergent/divergent validity at the item level, and relocating items based on the suggested factorial pattern, further EFA analyses were conducted within domains to inform the dimensionality of each independent domain. Then, MGCFA with omnibus measurement invariance and higher order modeling tests were conducted to confirm the internal latent structure for each domain.

### ***School - Domain 3***

As shown in Tables 12.0 and 12.1, the EFA results suggested a one factor model. However, the MGCFA based on the one factor solution resulted in a poor model fit. Four correlated residuals were added to address localized ill fit. Therefore, the one factor solution was not retained, and a four-factor model was, as the model fit indices statistics were much improved for the latter model (see Model A1 in Table 12.2).



According to the suggested four-factor pattern in Table 12.1, the school scale passed all measurement invariance tests from Model A1 to Model A7. A second order factor, *School*, was exacted and is considered a gender-invariant, second order, parallel scale at all levels. Again, this scale consists of four sub-scales/factors. The visual representation of the final scale is presented in Figure 1, and item descriptions are presented in Table 12.3.

Table 12.0 EFA on Domain 3 - School

Model	df	CFI	TLI	RMSEA [90% C.I.]	SRMR	Eigenvalues
1 Factor*	35	.975	.967	.149 [.147 - .150]	.062	6.669
2 Factors	26	.991	.984	.104 [.102 - .105]	.033	.917
3 Factors	18	.995	.987	.094 [.092 - .096]	.026	.591
4 Factors	11	.999	.997	.046 [.044 - .049]	.011	.512
5 Factors	5	1.000	1.000	.033 [.032 - .033]	.123	.338
6 Factors	0	N/A	N/A	N/A	N/A	.290

\*1 Factor solution is not retained due to poor RMSEA value in CFA and, multiple (n=4) correlated residuals have to be added in order to address localized ill fit issue.

Table 12.1 EFA – School

Item	Var Name	F1	F2	F3	F4
Enrollment	D3B1AN	.824	--	--	--
Involvement	D3B6N	.481	.394	--	--
Attendance	D3B9N	.547	--	--	--
Value in Ed	D3B3A1	--	.771	--	--
Encourage	D3B4N	--	.772	--	--
Staff Comfort	D3B5N	--	.828	--	--
Conduct	D3B7N	--	--	.779	--
Suspend/Expel	D3B8N	--	--	.856	--
Performance	D3B10N	--	--	--	.874
Assess Stay	D3B11N	--	.463	--	.453

Table 12.2 Omnibus Measurement Invariance and Structural Tests – School

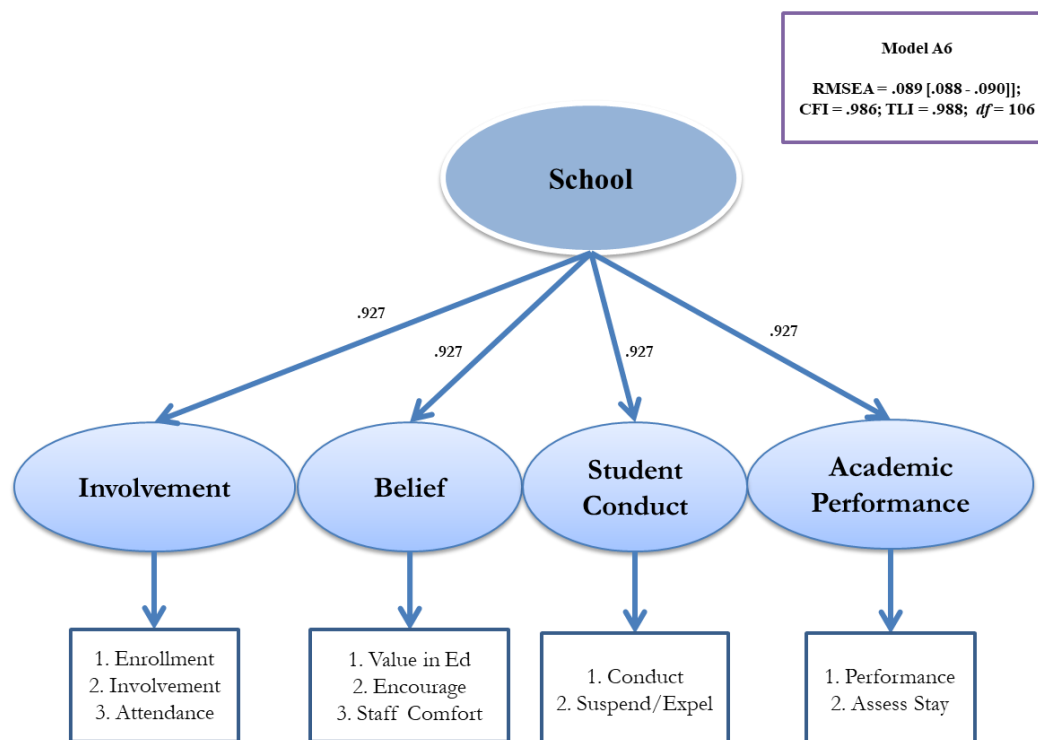
Model	Test of Structure/Invariance	df	CFI	TLI	RMSEA [90% C.I.]	Δ df	Δ CFI	Δ TLI	Pass?
A1	MGCFA - Configural Model	58	.995	.992	.075 [.073 - .076]	--	--	--	--
A2	MGCFA - Weak Invariant Model	68	.997	.995	.056 [.056 - .057]	10	+.002	+.003	Yes
A3	MGCFA - Strong Invariant Model	86	.996	.996	.053 [.052 - .054]	18	.001	+.001	Yes
A4	Second Order Model	93	.994	.995	.061 [.059 - .062]	7	.002	.001	Yes
A5	First Order within Factor Item Invariance Model	99	.988	.989	.085 [.084 - .086]	6	.006	.006	Yes
A6	First Order Factor loading Invariance Model	106	.986	.988	.089 [.088 - .090]	7	.002	.001	Yes
A7	One Group CFA Model	31	.995	.992	.072 [.070 - .073]	--	--	--	--

Table 12.3 School (Model A6)

Factor Loading		Item Loading		Item Description	Var Name
Male	Female	Male	Female		
<i>Involvement</i>	<i>Involvement</i>	.899	.848	Youth's current school enrollment status, regardless of attendance (A1)	<i>D3B1AN</i>

	(.927)		(.927)	.828	.848	Youth's involvement in school activities during most recent term (N)	D3B6N
				.783	.848	Youth's attendance in the most recent term (N)	D3B9N
				.957	.932	Youth believes there is value in getting an education (A1):	D3B3A1
Belief	Belief			.948	.932	Youth believes school provides an encouraging environment for him or her (A1)	D3B4N
(.927)	(.927)			.667	.932	Teachers, staff, or coaches the youth likes or feels comfortable talking with (N)	D3B5N
				.771	.844	Youth conduct in the most recent term (N)	D3B7N
Student Conduct	Student Conduct			.854	.844	Number of expulsions and suspensions in the most recent term (N)	D3B8N
(.927)	(.927)						
				.810	.880	Youth's academic performance in the most recent term (N)	D3B10N
Academic Performance	Academic Performance			.945	.880	Interviewer's assessment of likelihood the youth will stay in and graduate from high school or an equivalent vocational school (N)	D3B11N
(.927)	(.927)						

Figure 1. Criminogenic Needs - School



#### Association - Domain 4, 5, and 6

As shown in Table 13.0, a four-factor solution was retained. Tables 13.1 and 13.2 present findings from the structural and measurement tests. The items 'Unstructured Activity', 'Employment Status' and 'Romantic Relationship' were removed from the final the model because they were weakly associated with other items in this scale. The second order model passed all invariance tests and second order modeling tests.

Therefore, a second order, gender-invariant, parallel scale at all levels was exacted. This scale was termed *Association*. The visual representation of the final scale is presented in Figure 2, and item descriptions are presented in Table 13.3.

**Table 13.0 EFA on Domain 4, 5, 6 - Use of Time, Employment & Relationship**

Model	df	CFI	TLI	RMSEA [90% C.I.]	SRMR	Eigenvalues
1 Factor*	27	.982	.977	.225 [.224 - .226]	.206	3.743
2 Factors	19	.992	.985	.180 [.178 - .182]	.119	1.651
3 Factors	12	.997	.991	.138 [.136 - .141]	.070	1.405
<b>4 Factors</b>	<b>6</b>	<b>1.000</b>	<b>1.000</b>	<b>.015 [.012 - .018]</b>	<b>.005</b>	<b>.845</b>
5 Factors	1	1.000	1.000	.010 [.003 - .019]	.001	.504

**Table 13.1 EFA on Use of Time, Employment & Relationship**

Item	Var Name	F1	F2	F3	F4
<i>Structured Activity</i>	<i>D4B1N</i>	.986			
<i>Type of Structured Activity</i>	<i>D4B2N</i>	.967			
<i>Unstructured Activity</i>	<i>D5B1N</i>		.339		
<i>Understand Job Maintain</i>	<i>D5B2N</i>		.2004		
<i>Employment Status</i>	<i>D6B1N</i>			.710	
<i>Positive Adult</i>	<i>D6B2N</i>			.891	
<i>Community Ties</i>	<i>D6B3N</i>				.607
<i>Friends/Companions</i>	<i>D6B5N</i>				.895
<i>Admires/Emulates</i>	<i>D6B6N</i>				.840

**Table 13.2 Omnibus Measurement Invariance and Structural Tests – Use of Time, Employment & Relationship**

Model	Test of Structure/Invariance	df	CFI	TLI	RMSEA	Δ df	Δ CFI	Δ TLI	Pass?
					[90% C.I.]				
<b>B1*</b>	MGCFA - Configural Model	42	1.000	1.000	.028 [.026 - .029]	--	--	--	--
<b>B2</b>	MGCFA - Weak Invariant Model	51	1.000	1.000	.025 [.024 - .027]	9	.000	.000	Yes
<b>B3</b>	MGCFA - Strong Invariant Model	59	1.000	1.000	.028 [.026 - .029]	8	.000	.000	Yes
<b>B4</b>	First Order within Factor Item Invariance Model	64	.999	.999	.041 [.039 - .042]	5	.001	.001	Yes
<b>B5</b>	Second Order Tau Model	78	.998	.998	.062 [.061 - .063]	14	.001	.001	Yes
<b>B6</b>	One Group CFA Final Model	23	1.000	.999	.039 [.037 - .040]	--	--	--	--

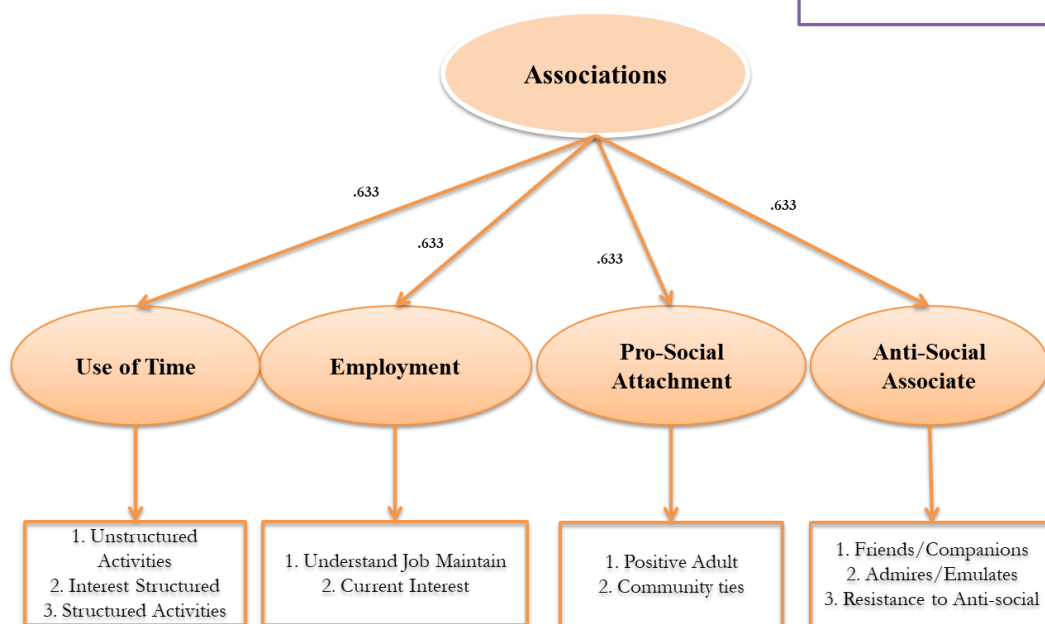
\* D5B3N was not retained in the final model because its weak correlation with other factors and item; D6B4N was not retained in the model because of its weak loading

**Table 13.3 Use of Time, Employment & Relationship (Model B5)**

Factor Loading		Item Loading		Item Description	Var
Male	Female	Male	Female		Name

<i>Use of Time</i>	<i>Use of Time</i>	.998	.983	Current interest and involvement in structured recreational activities	<i>D4B1N</i>
(.633)	(.633)	.970	.983	Types of structured recreational activities in which youth currently participates (N)	<i>D4B2N</i>
<i>Employment</i>	<i>Employment</i>	.782	.752	Understanding of what is required to maintain a job	<i>D5B1N</i>
(.633)	(.633)	.711	.752	Current interest in employment	<i>D5B2N</i>
<i>Pro-Social</i>	<i>Pro-Social</i>	.760	.846	Current positive adult non-family relationships not connected to school or employment	<i>D6B1N</i>
<i>Attachment</i>	<i>Attachment</i>	.956	.846	Current pro-social Community Ties	<i>D6B2N</i>
(.633)	(.633)				
<i>Anti-Social</i>	<i>Anti-Social</i>	.676	.814	Current friends/ companions youth actually spends time with	<i>D6B3N</i>
<i>Associate</i>	<i>Associate</i>	.898	.814	Currently admires/ emulates anti-social peers	<i>D6B5N</i>
(.633)	(.633)	.823	.814	Current resistance to anti-social peer influence	<i>D6B6N</i>

Figure 2. Criminogenic Needs - Association



### Family - Domain 7

As presented in Table 14.0, a five-factor solution was retained. As indicated in Table 14.1, the factorial pattern is clear for most items. Three items, including 'Willing to Support', 'Family Member Relationships' and 'Parental Authority' cross-loaded on other factors. As the differences in the strength of the loadings and cross-loadings are not substantial (.503 *vs* .402; .384 *vs* .359; .511 *vs* .421), the items were retained in their proposed domains. Based on the strength of the correlational relationship among the five factors, a third order factor, called *Family Support & Conflict*, was exacted. The Family Member Problem factor was not

considered a part of the third order factor model, as it shared little common variance with other factors with an  $r$  of .308 for the female sample and an  $r$  of .354 for the male sample. Additionally, this factor was not retained because the items are considered historical rather than dynamic. As displayed in Table 14.2, the *Family Support & Conflict* passed all the invariance and higher order modeling tests and is considered a gender-invariant, third order factor. The visual representation of the final scale is presented in Figure 3, and item descriptions are displayed in Table 14.3.

Table 14.0 EFA on Domain 7- Family

Model	df	CFI	TLI	RMSEA [90% C.I.]	SRMR	Eigenvalues
1 Factor	104	.885	.868	.104 [.103 - .105]	.093	5.192
2 Factors	89	.926	.900	.091 [.090 - .091]	.066	1.874
3 Factors	75	.970	.952	.063 [.062 - .064]	.039	1.550
4 Factors*	62	.987	.974	.046 [.045 - .047]	.025	1.135
<b>5 Factors</b>	<b>50</b>	<b>.995</b>	<b>.988</b>	<b>.031 [.030 - .032]</b>	<b>.017</b>	<b>.878</b>
6 Factors	N/A	N/A	N/A	N/A	N/A	.801

\*4-Factor Solution was not retained because the factor loadings are weak in CFA models

Table 14.1 EFA on Family

Item	Var Name	F1	F2	F3	F4	F5
<i>Annual Income</i>	<i>D7B1N</i>	.520				
<i>Risk 'Living With' Relationship</i>	<i>D7B2N</i>	.439				
<i>Family Jail/Prison</i>	<i>D7B3N</i>		.776			
<i>Parent Problem</i>	<i>D7B4N</i>		.729			
<i>Sibling Problem</i>	<i>D7B5N</i>		.422			
<i>Support Network</i>	<i>D7B6N</i>			.665		
<i>Willing to Support</i>	<i>D7B7N</i>			.503		.420
<i>Opportunities for Family Activities</i>	<i>D7B8N</i>			.789		
<i>Run away/kicked out</i>	<i>D7B9N</i>				.593	
<i>Family Member Relationships</i>	<i>D7B10N</i>			.384	.359	
<i>Level of Family Conflict</i>	<i>D7B11N</i>				.610	
<i>Parental Supervision</i>	<i>D7B12N</i>					.784
<i>Parental Authority</i>	<i>D7B13</i>				.511	.421
<i>Consistent Punishment</i>	<i>D7B14N</i>					.851
<i>Consistent Rewards</i>	<i>D7B15N</i>					.640
<i>Parental Characterization Youth's Behavior</i>	<i>D7B16N</i>					.566

Table 14.2 Omnibus Measurement Invariance and Structural Tests – Family (Model C10)

Model	Test of Structure/Invariance	df	CFI	TLI	RMSEA	$\Delta df$	$\Delta CFI$	$\Delta TLI$	Pass?
					[90% C.I.]				
<b>C1*</b>	MGCFI - Configural Model	188	.944	.929	.076 [.075 - .077]	--	--	--	--
<b>C2</b>	MGCFI - Weak Invariant Model	235	.946	.945	.067 [.066 - .068]	47	+.002	+.016	Yes
<b>C3</b>	MGCFI - Strong Invariant Model	230	.954	.952	.063 [.062 - .063]	5	+.008	+.007	Yes
<b>C4</b>	First Order within Factor Item Invariance Model – F1	231	.945	.943	.068 [.067 - .069]	1	.009	.009	Yes
<b>C5</b>	First Order within Factor Item Invariance Model – F2	233	.943	.939	.070 [.070 - .071]	2	.002	.004	Yes
<b>C6</b>	First Order within Factor Item Invariance Model – F3	235	.940	.946	.066 [.065 - .067]	2	.003	+.007	Yes
<b>C7</b>	First Order within Factor Item Invariance Model – F4	237	.941	.940	.070 [.069 - .071]	2	+.001	.006	Yes
<b>C8</b>	First Order within Factor Item Invariance Model – F5	241	.931	.932	.074 [.074 - .075]	4	.010	.008	Yes
<b>C9</b>	Second Order Tau Model (F3 + F5)	258	.923	.928	.076 [.076 - .077]	17	.008	.004	Yes

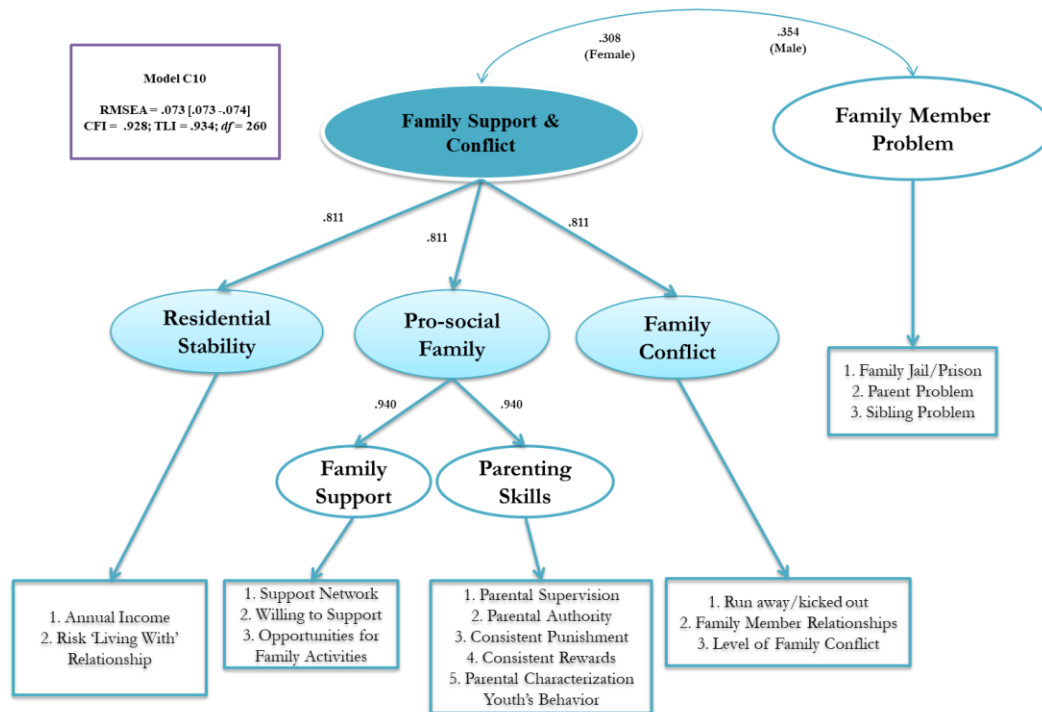
<b>C10</b>	Third Order Tau Model F1 + F4 + (F3 + F5)	260	.928	.934	.073 [.073 - .074]	2	+.005	+.006	Yes
<b>C11</b>	Final One Group CFA Model	101	.935	.923	.079 [.079 - .080]	--	--	--	--

\* D7B13 was retained in F5 because the CFA confirmed that it has strong relationship with other item from F5 instead of F3.

**Table 14.3 Family (Model C10)**

Second Order Factor Loading		First Order Factor Loading		Item Loading		Item Description	Var Name
Male	Female	Male	Female	Male	Female		
<i>Residential Stability</i>	<i>Residential Stability</i>	<i>Residential Stability</i>	<i>Residential Stability</i>	.310	.373	Living	<i>D7B1N</i>
<i>(.811)</i>	<i>(.811)</i>	<i>(--)</i>	<i>(--)</i>	.449	.373	Annual combined income of youth and family	<i>D7B2N</i>
<i>Family</i>	<i>Family</i>	<i>Family</i>	<i>Family</i>	.689	.582	Computed Binary - Family currently in jail	<i>D7B3N</i>
<i>Member Problem</i>	<i>Member Problem</i>	<i>Member Problem</i>	<i>Member Problem</i>	.744	.582	Computed – Parent Problem N	<i>D7B4N</i>
<i>(--)</i>	<i>(--)</i>	<i>(--)</i>	<i>(--)</i>	.575	.582	Computed Item – Sib Problem N	<i>D7B5N</i>
<i>Pro-social Family</i>	<i>Pro-social Family</i>	<i>Family</i>	<i>Family</i>	.692	.816	Support network for family	<i>D7B6N</i>
		<i>Support</i>	<i>Support</i>	.895	.816	Family willingness to help support of youth	<i>D7B7N</i>
<i>(.811)</i>	<i>(.811)</i>	<i>(.940)</i>	<i>(.940)</i>	.795	.816	Family provides opportunities for youth to participate in family activities and decisions	<i>D7B8N</i>
<i>Family</i>	<i>Family</i>	<i>Family</i>	<i>Family</i>	.450	.431	Youth has run away or been kicked out of home	<i>D7B9N</i>
<i>Conflict</i>	<i>Conflict</i>	<i>Conflict</i>	<i>Conflict</i>	.465	.431	Computed Item - CxFamily_RelationshipN	<i>D7B10N</i>
<i>(.811)</i>	<i>(.811)</i>	<i>(--)</i>	<i>(--)</i>	.523	.431	Level of conflict between parents, between youth and parents, among siblings	<i>D7B11N</i>
				.853	.742	Parental supervision	<i>D7B12N</i>
<i>Pro-social Family</i>	<i>Pro-social Family</i>	<i>Parenting</i>	<i>Parenting</i>	.669	.742	Parental authority and control	<i>D7B13</i>
		<i>Skills</i>	<i>Skills</i>	.703	.742	Consistent appropriate punishment for bad behavior	<i>D7B14N</i>
<i>(.811)</i>	<i>(.811)</i>	<i>(.940)</i>	<i>(.940)</i>	.817	.742	Consistent appropriate rewards for good behavior	<i>D7B15N</i>
				.531	.742	Parental characterization of youth's anti-social behavior	<i>D7B16N</i>

Figure 3. Criminogenic Needs - Family Support & Conflict



### Alcohol & Drug Needs - Domain 8

As shown in Table 15.0, a four-factor solution offered the best fit. Moreover, Table 15.1 suggests a 3-factor model with an additional bi-factor (*Alcohol Only*). Following an MGCFA, a second order factor (*Alcohol & Drug Needs*) was exacted by using the three factors. The bi-factor *Alcohol Only* was not retained in the second order factor model, given it shares little common variance with Alcohol & Drug Needs with an  $r$  of  $-.312$  for the female and an  $r$  of  $-.346$  for the male sample. Consequently, *Alcohol & Drug Needs* was considered as a second order, gender-invariant, parallel scale. The visual representation of the final scale is presented in Figure 4 (the identified bi-factor is not presented in the figure), and item descriptions are presented in Table 15.3.

Table 15.0 EFA on Domain 8 - Alcohol and Drugs

Model	df	CFI	TLI	RMSEA [90% C.I.]	SRMR	Eigenvalues
1 Factor	170	.950	.944	.077 [.076 - .077]	.149	11.711
2 Factors	151	.973	.966	.060 [.060 - .061]	.121	2.086
3 Factors	133	.982	.975	.052 [.051 - .052]	.069	1.795
<b>4 Factors</b>	<b>116</b>	<b>.987</b>	<b>.979</b>	<b>.047 [.046 - .048]</b>	<b>.053</b>	<b>1.132</b>
5 Factors	100	.990	.981	.045 [.044 - .046]	.045	.827

Table 15.1 EFA on Alcohol and Drugs

Item	Var Name	F1	F2	F3	F4
<i>Marijuana Use</i>	<i>D8B4</i>	.952			
<i>Meth use</i>	<i>D8B3_1</i>	1.111			
<i>Cocaine/Crack Use</i>	<i>D8B3_2</i>		.707		
<i>Heroin/Opiate Use</i>	<i>D8B3_3</i>		.700		
<i>Other Drug Use</i>	<i>D8B3_4</i>		.770		
<i>Alcohol Disrupts Ed</i>	<i>D8B3_5</i>		.527		
<i>Alcohol Family Conflict</i>	<i>D8B1_2</i>	.596		.532	
<i>Alcohol Interferes Pro-Social Friends</i>	<i>D8B1_3</i>	.615		.531	
<i>Alcohol Use Health Problems</i>	<i>D8B1_4</i>	.681		.469	
<i>Alcohol Contributes Criminal Behavior</i>	<i>D8B1_5</i>		.488	.776	
<i>Alcohol Tolerance</i>	<i>D8B1_6</i>	.553		.530	
<i>Alcohol Withdrawal</i>	<i>D8B1_7</i>			.441	.705
<i>Drug Disrupts Ed</i>	<i>D8B1_8</i>			.527	.693
<i>Drug Family Conflict</i>	<i>D8B2_2</i>	.679			
<i>Drug Interferes Pro-Social Friends</i>	<i>D8B2_3</i>	.700			
<i>Drug Use Health Problems</i>	<i>D8B2_4</i>	.755			
<i>Drug Contributes Criminal Behavior</i>	<i>D8B2_5</i>		.617	.348	
<i>Drug Tolerance</i>	<i>D8B2_6</i>	.626			
<i>Drug Withdrawal</i>	<i>D8B2_7</i>		.328		.784
<i>Treatment</i>	<i>D8B2_8</i>				.903

Table 15.2 Omnibus Measurement Invariance and Structural Tests – Alcohol and Drugs

Model	Test of Structure/Invariance	df	CFI	TLI	RMSEA	$\Delta df$	$\Delta CFI$	$\Delta TLI$	Pass?
[90% C.I.]									
<b>D1</b>	MGCFA - Configural Model	314	.983	.979	.046 [.046 - .047]	--	--	--	--
<b>D2</b>	MGCFA - Weak Invariant Model	341	.987	.985	.039 [.039 - .040]	27	+.004	+.006	Yes
<b>D3*</b>	MGCFA - Strong Invariant Model	339	.984	.982	.043 [.043 - .044]	25	+.001	+.003	Yes
<b>D4</b>	Second Order Model - Tau	351	.984	.983	.042 [.041 - .043]	12	.000	+.001	Yes
<b>D5</b>	First Order within Factor Item Invariance Model	374	.982	.982	.043 [.043 - .044]	23	.002	.001	Yes
<b>D6</b>	Final One Group CFA Model	161	.983	.980	.046 [.045 - .046]	--	--	--	--

\*Model A1 instead of A2 was used for model comparison because Model A3 (a bi-factor model) has less *df* than its weak group invariance model; the model was compared with A1 to determine the level of model detrimental fit.

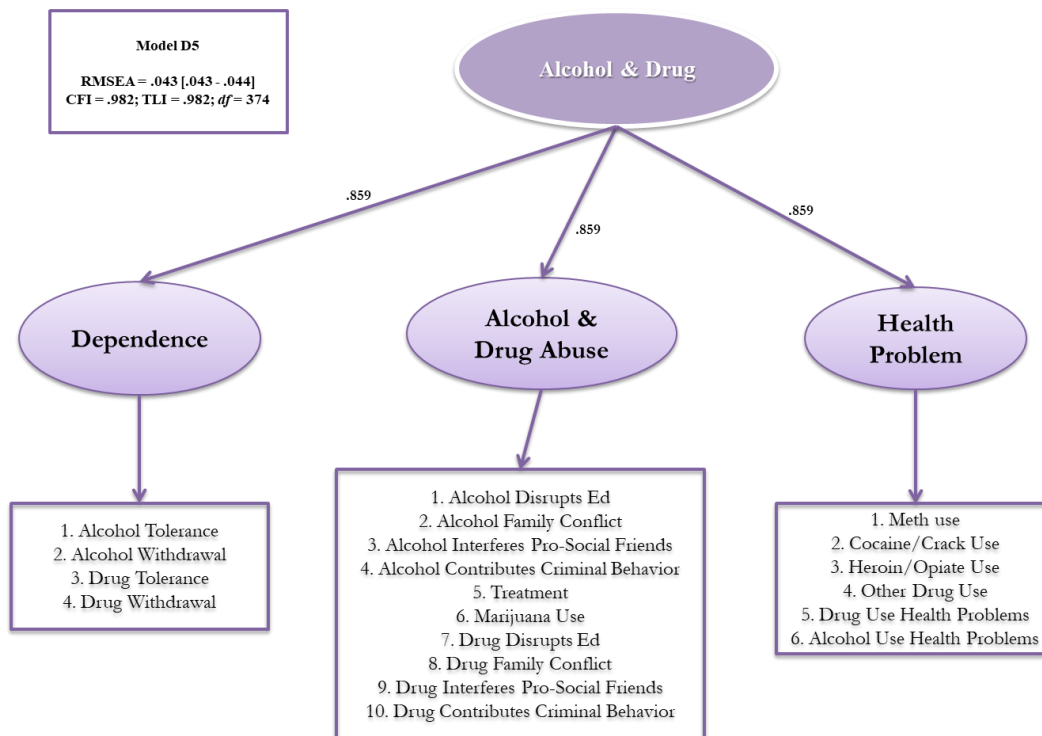
Table 15.3 Alcohol and Drugs (Model D5)

Factor		Item		Item Description	Bi-Factor		Var
Loading		Loading			Item Loading		Name
Male	Female	Male	Female		Male	Female	
Alcohol & Drug Abuse (.859)	Alcohol & Drug Abuse (.859)	.845	.900	Alcohol/drug treatment program participation	--	--	<i>D8B4</i>
		.991	.900	Marijuana	--	--	<i>D8B3_1</i>
		.927	.900	Alcohol disrupts education	.604	.587	<i>D8B1_2</i>
		.927	.900	Alcohol causes family conflict	.604	.587	<i>D8B1_3</i>
		.915	.900	Alcohol interferes with pro-social friendships	.596	.587	<i>D8B1_4</i>
		.824	.900	Alcohol contributes criminal behavior	.537	.587	<i>D8B1_6</i>
		.919	.900	Drug disrupts education	--	--	<i>D8B2_2</i>
		.922	.900	Drug causes family conflict	--	--	<i>D8B2_3</i>
		.901	.900	Drug interferes with pro-social friendships	--	--	<i>D8B2_4</i>



			.842	.900	Drug contributes criminal behavior	--	--	<i>D8B2_6</i>
						--	--	
			.811	.815	Amphetamines	--	--	<i>D8B3_2</i>
			.743	.815	Cocaine	--	--	<i>D8B3_3</i>
Health	Health		.773	.815	Heroin	--	--	<i>D8B3_4</i>
Problem	Problem		.782	.815	Other drugs	--	--	<i>D8B3_5</i>
(.859)	(.859)		.976	.815	Alcohol causes health problems	.702	.587	<i>D8B1_5</i>
			.919	.815	Drug causes health problems	--	--	<i>D8B2_5</i>
			.984	.941	Needs increasing amounts - Alcohol	.613	.587	<i>D8B1_7</i>
Dependence	Dependence		.960	.941	Experiences withdrawal problems - Alcohol	.598	.587	<i>D8B1_8</i>
(.859)	(.859)		.921	.941	Needs increasing amounts	--	--	<i>D8B2_7</i>
			.926	.941	Experiences withdrawal problems	--	--	<i>D8B2_8</i>

Figure 4. Criminogenic Needs - Alcohol & Drug



### Mental Health - Domain 9

The EFA and factorial pattern results for the mental health domain are presented in Tables 16.0 and 16.1, respectively. The findings suggest a one-factor solution. As shown in Table 16.2, the MGCFA analyses with measurement invariance and structural tests confirmed the factor of *Mental Health* as a group invariant

scale. However, one item, ‘Suicide Ideation’, failed the parallel test. The visual representation of the final scale is presented in Figure 5, and item descriptions are presented in Table 16.3.

**Table 16.0 EFA on Domain 9 - Mental Health**

Model	df	CFI	TLI	RMSEA [90% C.I.]	SRMR	Eigenvalues
<b>1 Factor</b>	<b>5</b>	<b>.998</b>	<b>.995</b>	<b>.042 [.038 - .045]</b>	<b>.034</b>	<b>3.595</b>
2 Factors	1	1.000	.996	.039 [.031 - .047]	.010	.621
3 Factors	N/A	N/A	N/A	N/A	N/A	.283

**Table 16.1 EFA on Mental Health**

Item	Var Name	F1
<i>Suicide Ideation</i>	<i>D9B1_8N</i>	.674
<i>ADD/ADHD</i>	<i>D9B2N</i>	.731
<i>Treatment</i>	<i>D9B3N</i>	.935
<i>Medication</i>	<i>D9B4N</i>	.916
<i>MH Issue Interfere Working with Youth</i>	<i>D9B5N</i>	.782

**Table 16.2 Omnibus Measurement Invariance and Structural Tests – Mental Health**

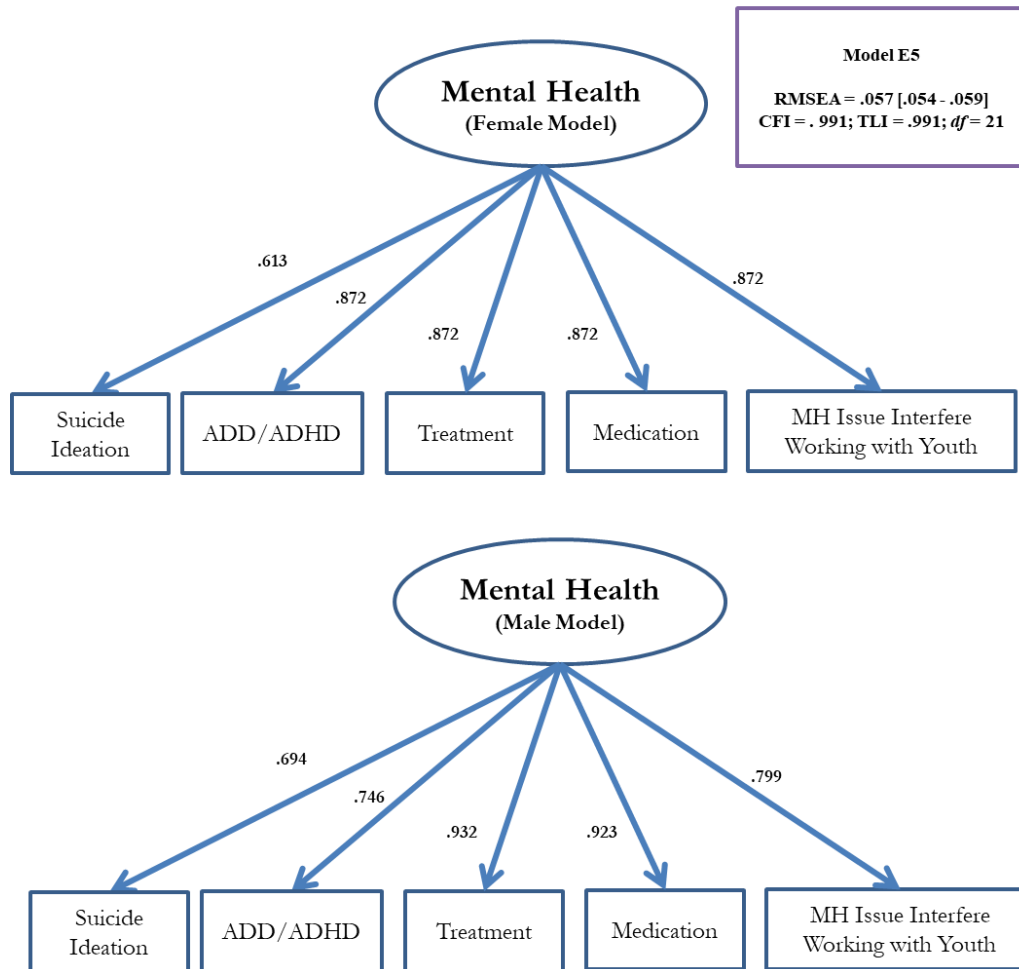
Model	Test of Structure/Invariance	df	CFI	TLI	RMSEA [90% C.I.]	Δ df	Δ CFI	Δ TLI	Pass?
<b>E1</b>	MGCFA - Configural Model	10	.998	.996	.038 [.034 - .041]	--	--	--	--
<b>E2</b>	MGCFA - Weak Invariant Model	15	.998	.997	.031 [.028 - .034]	5	.000	.001	Yes
<b>E3</b>	MGCFA - Strong Invariant Model	18	.994	.993	.050 [.048 - .053]	3	.004	.004	Yes
<b>E4</b>	Within Factor Item Invariance Model	22	.982	.981	.078 [.076 - .081]	4	.012	.008	No
<b>E5*</b>	Within Factor Partial Item Invariance Model	21	.991	.991	.057 [.054 - .059]	3	.003	.002	Yes
<b>E6</b>	Final One Group CFA Model	5	.998	.995	.042 [.038 - .045]	--	--	--	--

\*In Model E5, the constraint of Item D9B1\_8N is turned off, and Model E3 was used for comparison.

**Table 16.3 Mental Health (Model E5)**

Item Loading		Item Description	Var
Male	Female		Name
.694	.613	Current Suicide Ideation	<i>D9B1_8N</i>
.746	.872	Currently diagnosed with ADD/ADHD:	<i>D9B2N</i>
.932	.872	Mental health treatment currently prescribed, excluding ADD/ADHD treatment	<i>D9B3N</i>
.923	.872	Mental health medication currently prescribed excluding ADD/ADHD medication	<i>D9B4N</i>
.799	.872	Mental health problems currently interfere with working with the youth	<i>D9B5N</i>

Figure 5. Criminogenic Needs – Mental Health



#### Attitude/Behavior - Domain 10

To evaluate the internal latent structure of the Attitude/Behavior domain, EFA tests were conducted with all the items from domain 10 and one item from domain 11 ('Hostile Perception'), as suggested by previous EFA results. As shown in Table 17.0, a two-factor solution model was retained. According to the suggested factorial pattern displayed in Table 17.1, MGCFA with measurement and higher order modeling tests were conducted. The results are presented in Table 17.2. The findings suggest *Attitude/Behavior* is a gender-invariant, second order scale. The scale passed second order parallel tests; however, one item (Hostile Perception) failed the parallel test at the first order level. The visual representation of the final scale is presented in Figure 6, and item descriptions are displayed in Table 17.3.

Table 17.0 EFA on Domain 10 - Attitude/Behavior

Model	df	CFI	TLI	RMSEA [90% C.I.]	SRMR	Eigenvalues
1 Factor	54	.964	.955	.073 [.072 - .074]	.043	5.485

<b>2 Factors</b>	<b>43</b>	<b>.982</b>	<b>.972</b>	<b>.058 [.057 - .059]</b>	<b>.030</b>	<b>1.037</b>
3 Factors	33	.989	.979	.050 [.049 - .052]	.024	.928
4 Factors	24	.994	.983	.045 [.043 - .046]	.018	.837
5 Factors	16	.998	.990	.034 [.032 - .036]	.012	.753

Table 17.1 EFA on Attitude/Behavior

Item	Var Name	F1	F2
<i>Primary Criminal Emotion</i>	<i>D10A1N</i>		.325
<i>Primary Criminal Purpose</i>	<i>D10A2N</i>		
<i>Optimism</i>	<i>D10A3N</i>	.701	
<i>Impulsive</i>	<i>D10A4N</i>	.516	
<i>Belief in Control Actions</i>	<i>D10A5N</i>	.870	
<i>Empathy</i>	<i>D10A6N</i>	.786	
<i>Respect Property</i>	<i>D10A7N</i>		.670
<i>Respect Authority</i>	<i>D10A8N</i>		.573
<i>Pro-Social Conventions</i>	<i>D10A9N</i>		.970
<i>Accepts Responsibility</i>	<i>D10A10N</i>		.544
<i>Belief in Success</i>	<i>D10A11N</i>		.724
<i>Hostile Perception</i>	<i>D11A2N</i>		.781

Table 17.2 Omnibus Measurement Invariance and Structural Tests – Attitude/Behavior

Model	Test of Structure/Invariance	df	CFI	TLI	RMSEA	Δ df	Δ CFI	Δ TLI	Pass?
[90% C.I.]									
<b>F1</b>	MGCFA - Configural Model	68	.981	.975	.064 [.063 - .066]	--	--	--	--
<b>F2</b>	MGCFA - Weak Invariant Model	78	.990	.988	.044 [.043 - .046]	10	+.009	+.013	Yes
<b>F3</b>	MGCFA - Strong Invariant Model	91	.987	.987	.046 [.045 - .047]	13	.003	.001	Yes
<b>F4</b>	Second Order Tau Model	93	.988	.989	.044 [.042 - .045]	2	+.001	+.002	Yes
<b>F5</b>	First Order Factor Item Invariance	101	.973	.976	.063 [.062 - .064]	8	.015	.013	No
<b>F6*</b>	First Factor Partial Item Invariance	100	.984	.986	.048 [.047 - .049]	7	.004	.003	Yes
<b>F7</b>	Final One Group CFA	34	.991	.975	.064 [.063 - .066]	--	--	--	--

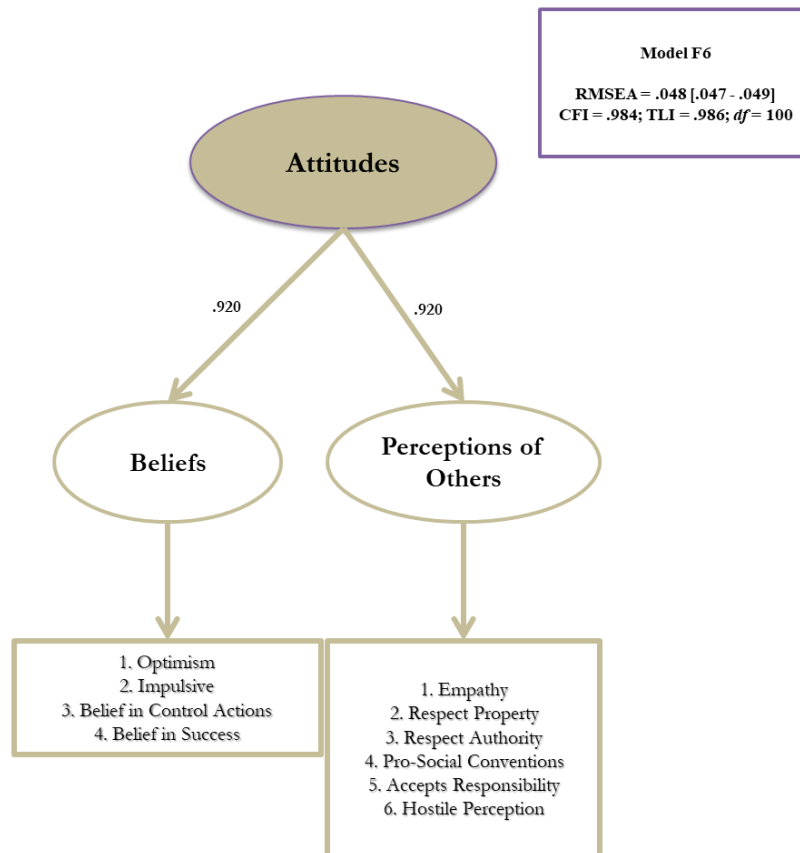
\*In Model F6, the constraint of Item D10A9N is turned off.

Table 17.3 Attitude/Behavior (Model F6)

Factor		Item Loading		Item Description	Var
Loading					Name
Male	Female	Male	Female		
		.729	.743	Optimism N	<i>D10A3N</i>
<b>Beliefs</b>	<b>Beliefs</b>	.727	.743	Impulsive; acts before thinking	<i>D10A4N</i>
<b>(.920)</b>	<b>(.920)</b>	.759	.743	Belief in control over antisocial behavior	<i>D10A5N</i>
		.789	.743	Belief in Success	<i>D10A11N</i>
<b>Perceptions</b>	<b>Perceptions</b>	.730	.757	Empathy, remorse, sympathy, or feelings for the victim(s) of criminal behavior:	<i>D10A6N</i>
<b>of Others</b>	<b>of Others</b>	.688	.757	Respect for property of others	<i>D10A7N</i>

(.920)	(.920)	.838	.757	Respect for authority figures	<i>D10A8N</i>
		.738	.757	Attitude toward pro-social rules/conventions in society	<i>D10A9N*</i>
		.811	.757	Accepts responsibility for anti-social behavior	<i>D10A10N</i>
		.496	.508	View of Hostile interpretation of actions and intentions of others in a common nonconfrontational setting	<i>D11A2N</i>

Figure 6. Criminogenic Needs – Attitude



### Aggression - Domain 11

The results of the EFA tests suggest a one-factor solution (see Tables 18.0 and 18.1). Following the MGCFA analyses, the *Aggression* scale passed all measurement tests. However, to address a localized ill-fit issue, a correlated residual was added between ‘Belief in Yelling’ and ‘Belief in Fighting’ for all models. The *Aggression* scale is a gender invariant, parallel scale. The visual representation of the final scale is presented in Figure 7, and item descriptions are presented in Table 18.3.

Table 18.0 EFA on Domain 11 - Aggression

Model	<i>df</i>	CFI	TLI	RMSEA [90% C.I.]	SRMR	Eigenvalues
<b>1 Factor</b>	<b>5</b>	<b>.988</b>	<b>.977</b>	<b>.095 [.092 - .098]</b>	<b>.035</b>	<b>3.127</b>
2 Factors	1	.999	.993	.054 [.044 - .059]	.008	.631
3 Factors	N/A	N/A	N/A	N/A	N/A	.556

Table 18.1 EFA on Aggression

Item	Var Name	F1
<i>Frustration Tolerance</i>	<i>D11A1N</i>	.674
<i>Belief in Yelling</i>	<i>D11A3N</i>	.731
<i>Belief in Fighting</i>	<i>D11A4N</i>	.935
<i>Violent Events Reported</i>	<i>D11A5N</i>	.916
<i>Control Aggression</i>	<i>D12A11N</i>	.782

Table 18.2 Omnibus Measurement Invariance and Structural Tests – Aggression

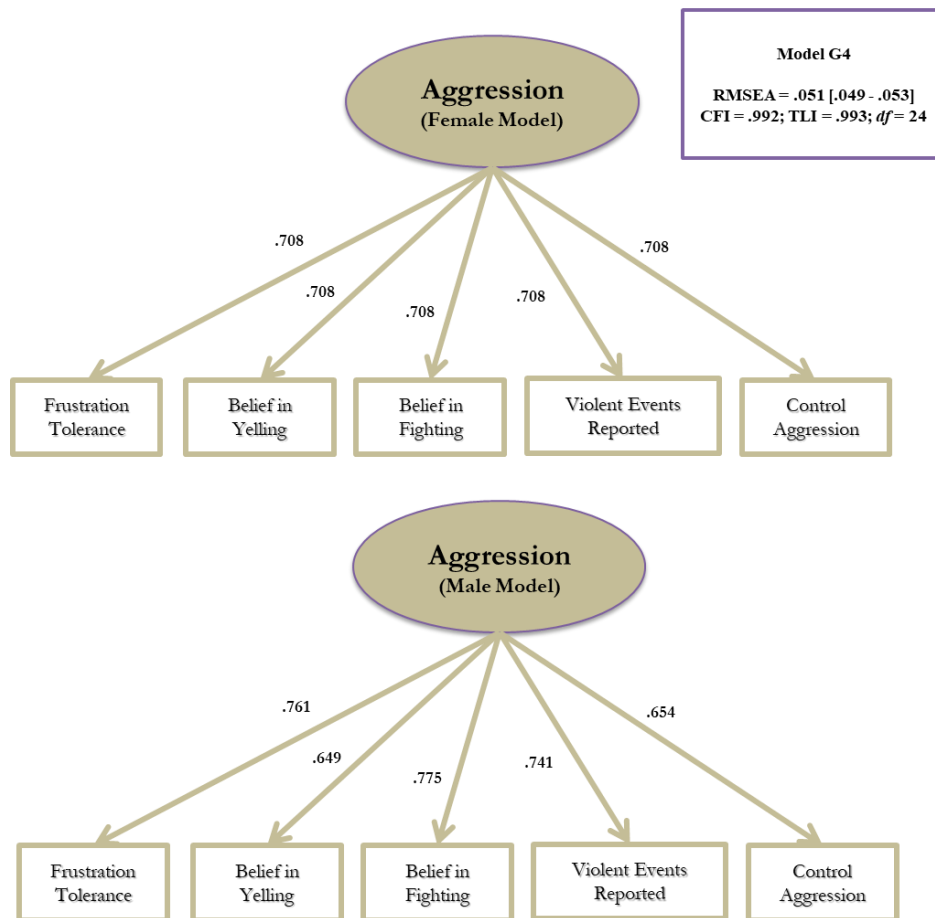
Model	Test of Structure/Invariance	df	CFI	TLI	RMSEA	$\Delta df$	$\Delta CFI$	$\Delta TLI$	Pass?
[90% C.I.]									
<b>G1*</b>	MGCFI - Configural Model	8	.997	.991	.058 [.054 - .062]	--	--	--	--
<b>G2</b>	MGCFI - Weak Invariant Model	13	.998	.998	.031 [.028 - .034]	5	+.001	+.007	Yes
<b>G3</b>	MGCFI - Strong Invariant Model	20	.995	.995	.044 [.041 - .046]	7	.003	.003	Yes
<b>G4</b>	Item Invariance	24	.992	.993	.051 [.049 - .053]	4	.003	.002	Yes
<b>G5</b>	Final One Group CFA Model	4	.996	.991	.061 [.057 - .064]	--	--	--	--

\*Correlated residual is added between D11A3N and D11A4N.

Table 18.3 EFA on Aggression (Model G4)

Item Loading		Item Description	Var
Male	Female		Name
.761	.708	Tolerance for frustration	<i>D11A1N</i>
.649	.708	Belief in yelling and verbal aggression to resolve a disagreement or conflict	<i>D11A3N</i>
.775	.708	Belief in fighting and physical aggression to resolve a disagreement or conflict	<i>D11A4N</i>
.741	.708	Violent Events Reported	<i>D11A5N</i>
.654	.708	Control of Aggression	<i>D12A11N</i>

Figure 7. Criminogenic Needs – Aggression



### Skills – Domain 12

As shown in Tables 19.0 and 19.1, a three-factor solution best fit the data. The fit statistics from the MGCFA also align with this finding (see Table 19.2). Together, the results suggest that the *Skill* scale is a second order, gender-invariant and parallel scale. The visual representation of the final scale is presented in Figure 8, and item descriptions are displayed in Table 19.3.

Table 19.0 EFA on Domain 12 - Skills

Model	<i>df</i>	CFI	TLI	RMSEA [90% C.I.]	SRMR	Eigenvalues
1 Factor	35	.987	.983	.081 [.079 - .082]	.121	6.953
2 Factors	26	.993	.987	.069 [.068 - .071]	.065	.648
<b>3 Factors*</b>	<b>18</b>	<b>.998</b>	<b>.996</b>	<b>.039 [.037 - .041]</b>	<b>.012</b>	<b>.567</b>
4-6 Factors	N/A	N/A	N/A	N/A	N/A	.527

\*1 Factor solution is not retained due to poor RMSEA value in CFA and, multiple ( $n=3$ ) correlated residuals have to be added in order to address localized ill fit issue.

Table 19.1 EFA on Skills

Item	Var Name	F1	F2	F3
<i>Consequential Thinking</i>	<i>D12A1N</i>	.848		
<i>Goal Setting</i>	<i>D12A2N</i>	.468		
<i>Problem Solving</i>	<i>D12A3N</i>	.870		
<i>Situational Perception</i>	<i>D12A4N</i>	.604	.359	
<i>Dealing with Others</i>	<i>D12A5N</i>	.341	.631	

<i>Difficult Situations</i>	<i>D12A6N</i>	.838	
<i>Dealing with Emotions</i>	<i>D12A7N</i>	.785	
<i>Internal Triggers</i>	<i>D12A8N</i>		.267
<i>External Triggers</i>	<i>D12A9N</i>	1.004	
<i>Control Impulses</i>	<i>D12A10N</i>	.688	

Table 19.2 Omnibus Measurement Invariance and Structural Tests – Skills

Model	Test of Structure/Invariance	df	CFI	TLI	RMSEA	$\Delta df$	$\Delta CFI$	$\Delta TLI$	Pass?
[90% C.I.]									
H1	MGCFA - Configural Model	64	.992	.988	.088 [.087 - .089]	--	--	--	--
H2	MGCFA - Weak Invariant Model	74	.996	.995	.056 [.054 - .057]	10	+.004	+.007	Yes
H3	MGCFA - Strong Invariant Model	89	.995	.995	.055 [.054 - .056]	15	.001	.000	Yes
H4	Second Order Tau Model	91	.994	.994	.062 [.061 - .063]	2	.001	.001	Yes
H5	First Order Factor Within Factor Item Invariance	98	.987	.988	.088 [.086 - .089]	7	.007	.006	Yes
H6	First order Factor Loading Item Invariance	103	.988	.989	.083 [.082 - .084]	2	+.001	+.001	Yes
H7	Final One Group CFA	34	.990	.986	.094 [.093 - .096]	--	--	--	--

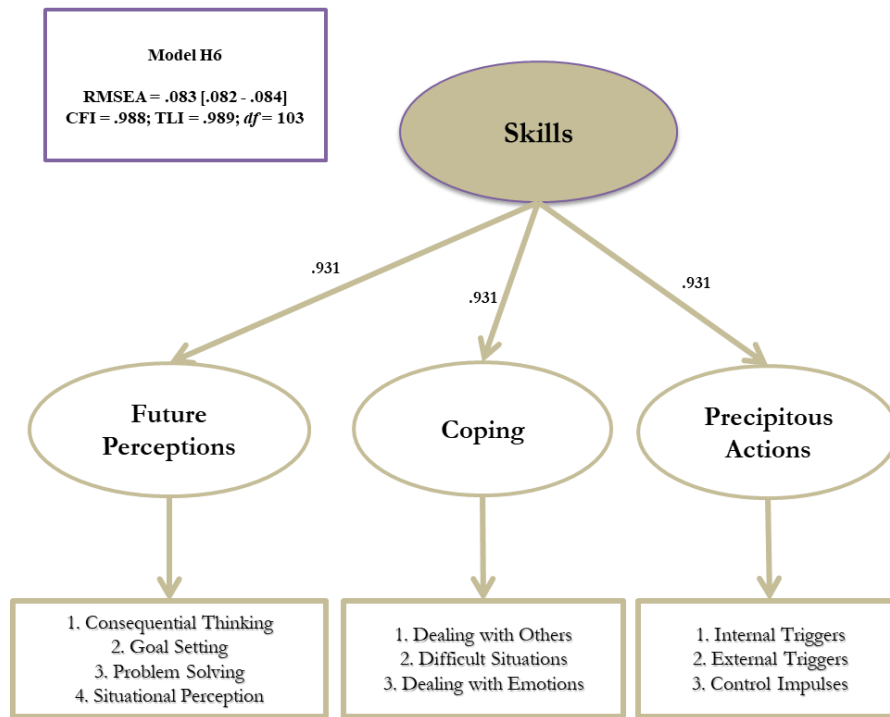
The constraint of Item D10A9N is turned off.

Table 19.3 Skills (Model H6)

Factor Loading		Item Loading		Item Description	Var
Male	Female	Male	Female		Name
<i>Future</i> <i>Perceptions</i> (.931)	<i>Future</i> <i>Perceptions</i> (.931)	.770	.847	Consequential thinking	<i>D12A1N</i>
		.699	.847	Goal setting	<i>D12A2N</i>
		.894	.847	Problem-solving	<i>D12A3N</i>
		.946	.847	Situational perception	<i>D12A4N</i>
<i>Coping</i> (.931)	<i>Coping</i> (.931)	.915	.926	Dealing with others	<i>D12A5N</i>
		.947	.926	Dealing with difficult situations:	<i>D12A6N</i>
		.919	.926	Dealing with feelings/emotions	<i>D12A7N</i>
<i>Precipitous</i>	<i>Precipitous</i>	.923	.859	Monitoring of internal triggers (distorted thoughts) that can lead to trouble	<i>D12A8N</i>
<i>Actions</i>	<i>Actions</i>	.908	.859	Monitoring of external triggers (events or situations) that can lead to trouble:	<i>D12A9N</i>
(.931)	(.931)	.687	.859	Control of impulsive behaviors that get youth into trouble:	<i>D12A10N</i>



Figure 8. Criminogenic Needs – Skills



#### *All individual Scales – One Group CFA*

As a result of all individual scales passing group invariance tests, and additional one group CFA was conducted with a combined gender sample. We used the identified scales from the MGCFA tests, and the findings from the one group CFA demonstrate that all of the identified scales functions similarly to the results of the MGCFA analyses. The CFI, TLI and RMSEA statistics are all in the acceptable range, as presented in Table 20.

Table 20 All Domains One Group CFA Final Models

Model	Test of Structure/Invariance	$df$	CFI	TLI	RMSEA
					[90% C.I.]
I1	School	31	.995	.992	.072 [.070 - .073]
I2	Association = Use of Time + Employment + Relationships	23	1.000	.999	.039 [.037 - .040]
I3***	Family	101	.935	.923	.079 [.079 - .080]
I4*	Alcohol and Drug	161	.983	.980	.046 [.045 - .046]
I5	Mental Health	5	.998	.995	.042 [.038 - .045]

<b>I6*</b>	Attitude/Behavior	55	.943	.932	.090 [.089 - .092]
<b>I7**</b>	Aggression	4	.996	.991	.061 [.057 - .064]
<b>I8*</b>	Skills	34	.990	.986	.094 [.093 - .096]

\*Higher order factor loadings are constrained to be equal to obtain over-identified model

\*\*Correlated residual added between D11A3N and D11A4N

\*\*\*Family does not contain 'Family Member Problem' because it is historical in nature.

### ***Convergent/Divergent Validity at the Scale Level***

Before conducting EFA tests to evaluate the convergent and divergent validity at the scale level, the composite scores for each of the identified scales were computed and used as an indicator in the EFA models. As presented in Table 21.0, a two-factor solution fit the data. Table 21.1 shows that mental health cross-loaded on factor F1 while also loading on factor F2. Given the loading (.676) is stronger than the cross-loading (.317), mental health is retained in factor F2 for further MGCFA analyses. The strong loadings within Factor F2 and face validity of the domains suggest that these four domains might represent an underlying latent factor.

**Table 21.0 EFA on All Domains Composite Scores**

Model	df	CFI	TLI	RMSEA [90% C.I.]	SRMR	Eigenvalues
1 Factor	14	.916	.874	.107 [.105 - .109]	.047	3.339
<b>2 Factors</b>	<b>8</b>	<b>.983</b>	<b>.954</b>	<b>.064 [.062 - .067]</b>	<b>.017</b>	<b>1.180</b>
3 Factors	7	.997	.987	.031 [.028 - .034]	.008	.849

**Table 21.1 EFA on 2-Factor Solution**

<i>Scales</i>	<i>F1</i>	<i>F2</i>
<i>School</i>	.594	
<i>Association</i>	.668	
<i>Family</i>	.449	
<i>Substance Abuse</i>	.474	
<i>Mental Health</i>	.317	.676
<i>Attitude/Behavioral</i>		.677
<i>Aggression</i>		.557
<i>Skills</i>		.452

### ***MGCFA - Mental Health + Attitude/Behavioral + Aggression + Skills***

Based on the EFA evidence, Mental Health, Attitude/Behavioral and Aggression were selected for further measurement invariance and higher order modeling tests. As presented in Table 21.2, these four domains passed the second order modeling tests (Model J-3) but did not pass the parallel tests. The final model was retained after releasing the constraint on the mental health factor. The result is a higher order mental health factor with a loading of .345 (see Table 21.3). As this this loading is relative weak compared to the other three loadings (.817), the mental health factor is not retained in the final scale.

**Table 21.2 Omnibus Measurement Invariance and Structural Tests – D9 D10 D11 D12**  
**Mental Health + Attitude/Behavioral + Aggression + Skills**

Model	Test of Structure/Invariance	df	CFI	TLI	RMSEA	$\Delta df$	$\Delta CFI$	$\Delta TLI$	Pass?
[90% C.I.]									
<b>J1</b>	MGCFA - Baseline Model	862	.967	.967	.055 [.055 - .056]	--	--	--	--
<b>J2</b>	MGCFA - Second Order Tau Model with All Four Factors	881	.945	.946	.071 [.070 - .071]	19	.022	.021	No
<b>J3*</b>	MGCFA - No Constraint on Mental Health	879	.963	.964	.058 [.058 - .058]	17	.004	.003	Yes

\*In Model H3, Model H1 was used for comparison.

**Table 21.3 Mental Health + Attitude/Behavioral + Aggression + Skills ( Model J3)**

Factor Loading		Factor
Male	Female	
.817	.817	Skills
.817	.817	Aggression
.817	.817	Attitude/Behavioral
.354	.345	Mental Health

*MGCFA - Attitude/Behavioral + Aggression + Skills = Cognition & Behaviors*

Measurement invariance and higher order modeling tests were re-conducted by using only Attitude/Behavioral, Aggression and Skills. As shown in Table 21.4, the model passed an omnibus second order and measurement invariance test (Model K2). Therefore, domains 10, 11 and 12 are measures of a higher order factor, which we call ‘Cognition & Behaviors’. The visual representation of the final scale is presented in Figure 9, and the loadings of the higher order factor are presented in Table 21.5.

**Table 21.4 Omnibus Measurement Invariance and Structural Tests –D10 D11 D12**  
**Attitude/Behavioral + Aggression + Skills**

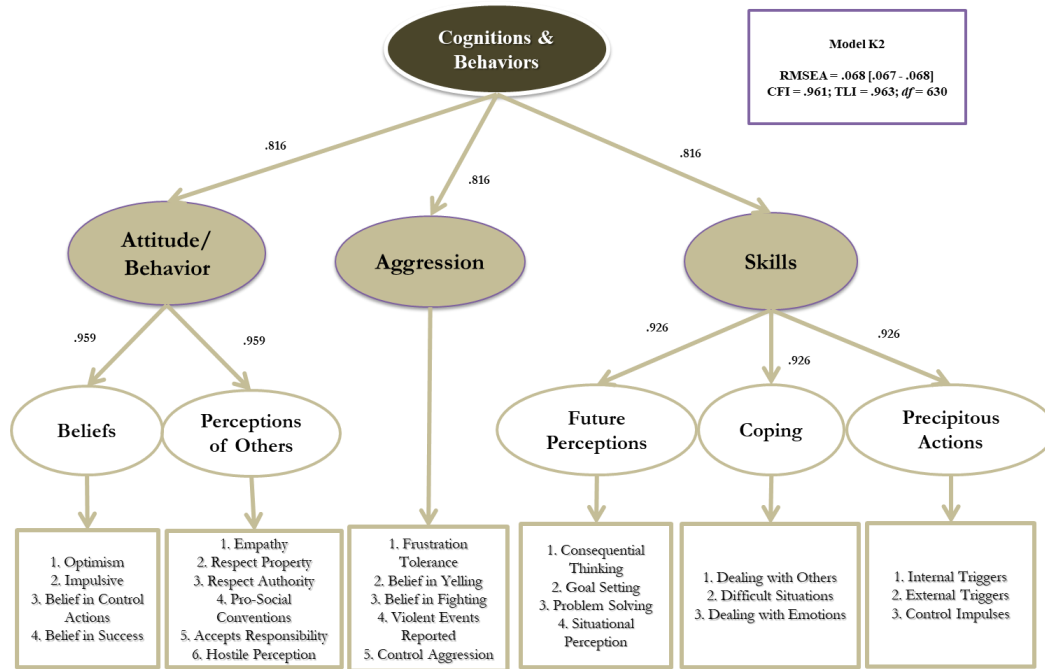
Model	Test of Structure/Invariance	df	CFI	TLI	RMSEA	$\Delta df$	$\Delta CFI$	$\Delta TLI$	Pass?
[90% C.I.]									
<b>K1</b>	MGCFA - Baseline Model	603	.966	.968	.063 [.063 - .064]	--	--	--	--
<b>K2</b>	MGCFA - Second Order Tau Model	630	.961	.963	.068 [.067 - .068]	27	.005	.005	Yes

**Table 21.5 Attitude/Behavioral + Aggression + Skills (Model K2)**

--

Factor Loading		Factor
Male	Female	
.816	.816	Skills
.816	.816	Aggression
.816	.816	Attitude/Behavioral

Figure 9. Criminogenic Needs – Cognitions & Behaviors



### *Global Criminogenic Needs Factor Model - EFA with School, Association, Family, Drug, Cognitions & Behaviors and Mental Health*

Further EFA analyses were conducted using the School, Association, Family, Drug, and Mental Health scales, as well as the established higher order scale of Cognitions & Behaviors. As demonstrated in Table 22, a two-factor solution is obtained. However, after examining factorial pattern displayed in Table 22.1, the two-factor solution is not retained because the loadings of the Mental Health scale are weak (.238). Accordingly, we selected the one-factor solution. As displayed in Table 22.2, the factorial pattern of the one-factor solution also suggests that Mental Health is not a measure of the underlying G-factor.

Table 22.0 EFA on School, Association, Family, Drug, Cognitions & Behaviors and Mental Health

Model	df	CFI	TLI	RMSEA [90% C.I.]	SRMR	Eigenvalues
1 Factor	9	.918	.864	.099 [.097 - .102]	.039	2.566
2 Factors	8	.983	.954	.064 [.062 - .067]	.017	1.060
3 Factors	--	--	--	--	--	--

Table 22.1 EFA on 2-Factor Solution – Not Retained

Scales	F1	F2
<i>School</i>	.631	--
<i>Association</i>	.673	--
<i>Family</i>	.551	--
<i>Substance Abuse</i>	.497	--
<i>Cognitions &amp; Behaviors</i>	.001	1.205
<i>Mental Health</i>	-.096	.238

Table 22.2 EFA on 1-Factor Solution - Retained

Scales	F1
<i>School</i>	.553
<i>Association</i>	.774
<i>Family</i>	.621
<i>Substance Abuse</i>	.414
<i>Cognitions &amp; Behaviors</i>	.728
<i>Mental Health</i>	.122

### EFA with School, Association, Family, Drug, and Cognitions & Behaviors

The EFA was re-run with the School, Association, Family, Drug, Cognitions & Behaviors scales. The results indicated a one-factor solution (see Table 22.3). Loadings from the EFA are displayed in the Table 22.4, and they demonstrate that the one-factor solution is an acceptable EFA model. In short, the loadings of the indicators/scales form an underlying factor, and a one-factor solution is retained.

Table 22.3 EFA on Domains Scores (No Mental Health)

Model	df	CFI	TLI	RMSEA [90% C.I.]	SRMR	Eigenvalues
1 Factor	5	.971	.943	.075 [.071 - .078]	.024	2.550
2 Factors	1	.997	.972	.052 [.045 - .060]	.008	.819
3 Factors	--	--	--	--	--	--

Table 22.4 EFA on 1-Factor Solution (No Mental Health)

Scales	F1
<i>School</i>	.556
<i>Association</i>	.783
<i>Family</i>	.618
<i>Substance Abuse</i>	.417
<i>Attitude/Behavioral+ Aggression+ Skills</i>	.718

### ***Global Criminogenic Needs Factor Model – True Score Variance Model***

The School, Association, Family, Drug, and Cognitions & Behaviors scales have been identified as group invariant, parallel, higher order factor scales. To estimate the true relationships among these scales, we used their true score variances, extracted based on  $\psi$  coefficients, as indicators in the final G-Factor Model.

### Construct Reliability

Construct reliability was estimated for all of the identified, independent higher order scales, including School, Association, Family, Drug, and Cognitions & Behaviors. Table 23.0 presents the construct reliability by using two different estimators,  $\psi$  and Cronbach's Alpha. The construct reliability for all the scales,

according to the *wh* coefficients, are .860 (School), .599 (Association), .558 (Family), (.709) Substance Abuse, and .788 (Cognitions & Behaviors). Cronbach's Alpha coefficients are reported for comparison and reference.

**Table 23.0 Construct Reliability**

Scales	<i>wh</i>	<i>Cronbach Alpha</i>
<i>School</i>	.860	.899
<i>Association</i>	.599	.541
<i>Family</i>	.558	.404
<i>Substance Abuse</i>	.709	.372
<i>Cognitions &amp; Behaviors</i>	.788	.750

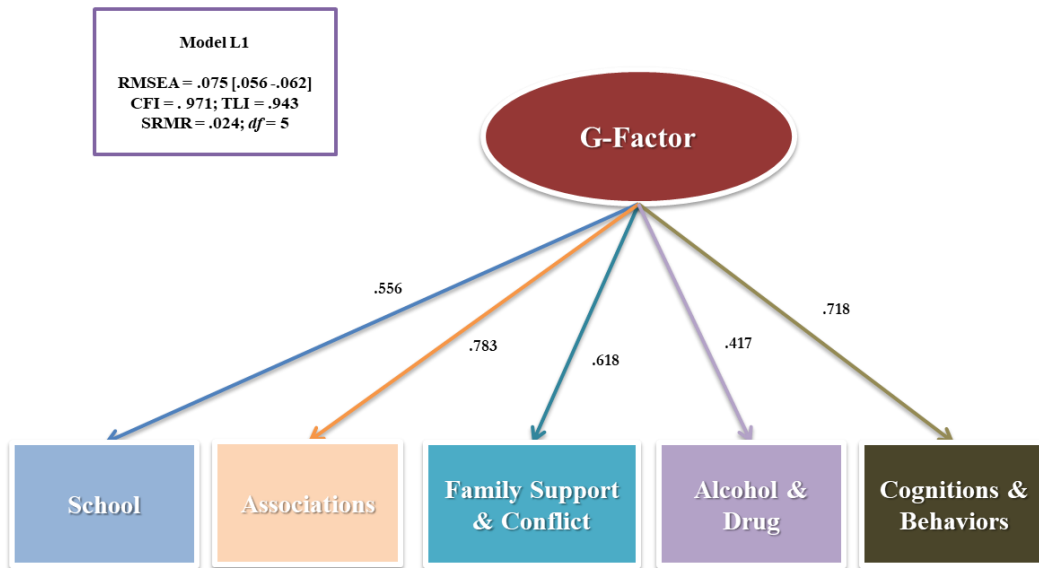
### ***Final Model and Measurement Invariance Test***

To confirm the G-Factor model, both the composite scores variance and true score variance indicators were used. These indicators were tested in independent models. As displayed Model 1 in Table 24.0 and Figure 10, the composite score (unweighted) indicator model results in a CFI of .971, TLI of .943, and RMSEA of .075. The loadings for School (.556), Association (.783), Family Support & Conflict (.618), Substance Abuse (.417), and Cognitions & Behaviors (.718) are relatively weak, as the indicators contain true score variance and factor disturbances (Mei, 2018). The visual representation of the G-Factor Composite Score Model is presented in Figure 10.

**Table 24.0 One Group - Final Global-Risk-Needs CFA Model**

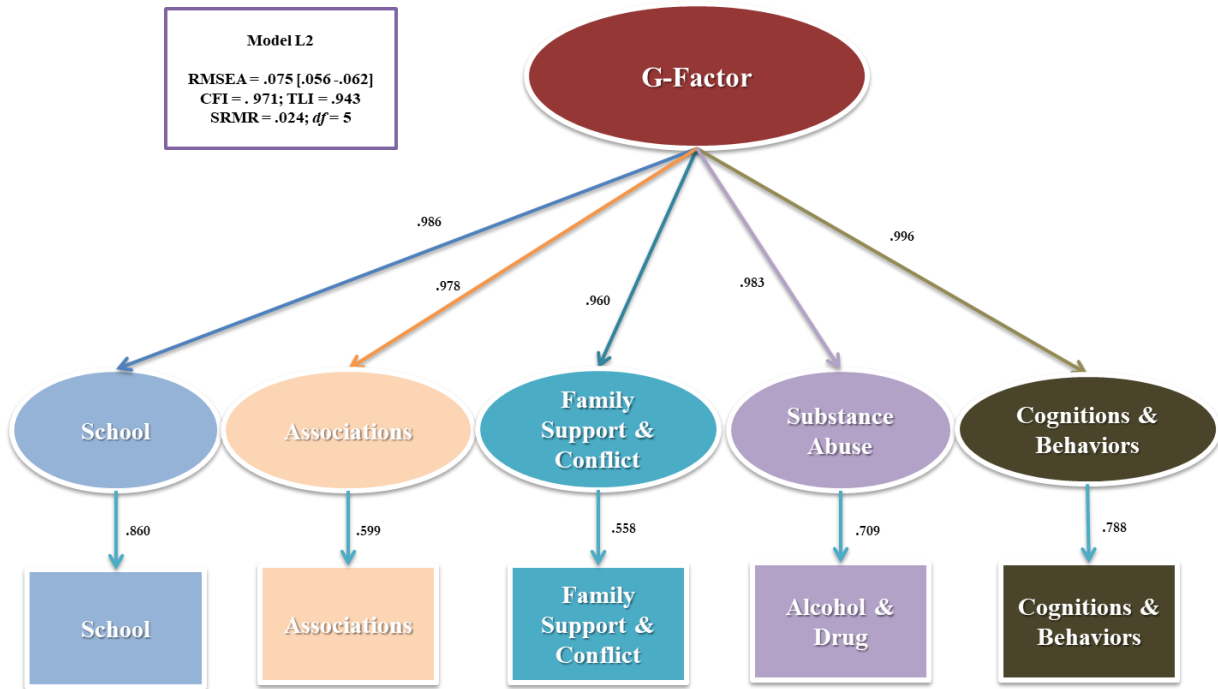
Model	Test of Structure/Invariance	<i>df</i>	CFI	TLI	RMSEA	SRMR	$\Delta df$	$\Delta CFI$	$\Delta TLI$	Pass?
[90% C.I.]										
<b>L1</b>	Composite Score Model	5	.971	.943	.075 [.071 - .078]	.024	--	--	--	--
<b>L2</b>	True Score Variance Model – Baseline Model	5	.971	.943	.075 [.071 - .078]	.024	--	--	--	Final Model
<b>L3</b>	True Score Variance Tau Model	9	.784	.760	.153 [.150 - .155]	.146	9	.187	.183	No

Figure 10. Global Criminogenic Needs Factor – Composite Score Model



In Model L2, the scales' true score variances were used as indicators in the final one group, one-factor CFA model. With a CFI of .971, TLI of .943, RMSEA of .075, as well as strong loadings for School (.986), Association (.978), Family Support & Conflict (.960), Substance Abuse (.983) and Cognitions & Behaviors (.996), this model (L2) is retained as the final G-factor model.

Figure 11. Global Criminogenic Needs Factor – True Score Variance Model





## Appendix VI – Criminogenic Needs Models

School Needs Model											
	Min	Max	Male				Female				
			Any	Felony	Violent	Property	Drug	Any	Felony	Violent	Property
<b>SCHOOL INVOLVEMENT</b>	-6	8									
Current enrollment status, regardless of attendance											
Graduated, GED or full-time							-2		-2		-2
Part-time							-1		-1		-1
Suspended, dropped out or expelled							3		3		3
Involvement in school activities											
Two or more			-2				-2		-2		-2
One			-1				-1		-1		-1
Not involved but interested			1				1		1		1
Not interested			2				2		2		2
Attendance											
Good, few excused absences							-2		-2		-2
No unexcused absences							-1		-1		-1
Some partial-day unexcused absences							1		1		1
Some full-day unexcused absences							2		2		2
Truant or withdrawn							3		3		3
<b>BELIEVE ENCOURAGE &amp; STAFF SCALE</b>	-4	4									
Believes there is value in getting an education											
Yes			-1	-1	-1		-1		-1		-1
Somewhat			1	1	1		1		1		1
No			2	2	2		2		2		2
Believes school provides an encouraging environment											
Yes			-1	-1	-1		-1		-1		-1
Somewhat			1	1	1		1		1		1
No			2	2	2		2		2		2
Teachers, staff, or coaches the youth likes or feels comfortable talking to											
None			0	0	0	0	0	0	0	0	0
One			-1	-1	-1	-1	-1	-1	-1	-1	-1
Two or more			-2	-2	-2	-2	-2	-2	-2	-2	-2
<b>EXPULSIONS &amp; CONDUCT SCALE</b>	-4	8									
History of expulsions & suspensions since the first grade											
None			-1	-1	-1	-1	-1	-1	-1	-1	-1
One			1	1	1	1	1	1	1	1	1
Two or more			2	2	2	2	2	2	2	2	2
Number of expulsions & suspensions in the most recent term											
None			-1	-1	-1	-1	-1	-1	-1	-1	-1
One			1	1	1	1	1	1	1	1	1
Two or three			2	2	2	2	2	2	2	2	2
Over three			3	3	3	3	3	3	3	3	3
Conduct in the most recent term											
Recognition for good school behavior			-2	-2	-2	-2	-2	-2	-2	-2	-2
No problems			-1	-1	-1	-1	-1	-1	-1	-1	-1

Problems reported by teachers	1	1	1	1	1	1	1	1	1	1		
Calls to parents	2	2	2	2	2	2	2	2	2	2		
Calls to police	3	3	3	3	3	3	3	3	3	3		
ASSESSMENT STAY, ATTENDANCE, ACADEMIC SCALE												
Academic performance	-4	4										
Mostly As	-9	-6	-3	-6	-3	-6	-3		-3	-3		
Mostly As & Bs	-6	-4	-2	-4	-2	-4	-2		-2	-2		
Mostly Bs & Cs, no Fs	-3	-2	-1	-2	-1	-2	-1		-1	-1		
Mostly Cs & Ds, some Fs	3	2	1	2	1	2	1		1	1		
Some Ds & mostly Fs	6	4	2	4	2	4	2		2	2		
Assessment of youth's likelihood of staying and graduating												
Very likely	-3	-2	-1	-2	-1	-2	-1		-1	-1		
Uncertain	3	4	1	4	1	4	1		1	1		
Not likely	6	6	2	6	2	6	2		2	2		
SINGLE ITEM												
Special education student or special education need												
None			1	1	1	1		1	1			
Behavior	7	6	10	5	6	1	5	9	5			
ADHD	1		2	2			3	3		1		
Learning			1		1	1	3	6	1			
RESULTS												
AUC	0.6	0.59	0.6	0.58	0.57	0.57	0.6	0.58	0.56	0.57		
Cut point												
Low-Moderate	0	4	0	0	0	0	6	6	6	0		
Moderate-High	19	18	14	13	14	13	17	13	10	20		
Population %												
Low	16	28	17	19	18	24	41	68	64	20		
Moderate	55	53	54	67	48	67	41	26	30	65		
High	29	19	28	14	34	8	18	6	6	16		
Recidivism %												
Low	37	16	14	19	6	34	8	13	19	3		
Moderate	54	25	21	31	9	45	13	15	24	4		
High	64	31	29	39	11	53	16	27	31	7		
Gender-neutral base rate	34	16	14	19	5	34	16	14	19	5		
Association Needs Model												
			Male					Female				
			Any	Felony	Violent	Property	Drug	Any	Felony	Violent	Property	Drug
	Min	Max										
CURRENT STRUCTURED & UNSTRUCTURED FREE TIME ACTIVITIES SCALE												
Current interest in Structured activities	-5	0										
None			0	0	0	0	0	0			0	0
Some			-1	-1	-1	-1	-1	-1			-1	-1
Current interest and involvement in structured recreational activities												
Two or more			-3	-3	-3	-3	-3	-3			-3	-3
One			-2	-2	-2	-2	-2	-2			-2	-2
Interested, not involved			-1	-1	-1	-1	-1	-1			-1	-1
Not interested			0	0	0	0	0	0			0	0
Current interest and involvement in unstructured recreational activities												
Two or more			-3	-3	-3	-3	-3	-3			-3	-3
One			-2	-2	-2	-2	-2	-2			-2	-2
Interested, not involved			-1	-1	-1	-1	-1	-1			-1	-1
Not interested			0	0	0	0	0	0			0	0
HISTORY & CURRENT EMPLOYMENT												
	-5	0										

RELATIONSHIPS & UNDERSTANDING SCALE										
History of positive personal relationship(s) with past employer(s) or adult coworker(s)										
None										0
One										-1
Two or more										-2
Current positive personal relationship(s) with employer(s) or adult coworker(s)										
Not currently employed or currently employed but no positive relationships	0	0	0	0	0	0	0	0	0	0
One or more	-2	-2	-2	-1	-2	-1	-3			-1
Understanding of what is required to maintain a job										
Lacks knowledge to maintain Job	0	0	0	0	0	0		0	0	
Has knowledge to maintain Job	-1	-3	-3	-1	-3	-2		-3	-1	
Has demonstrated maintaining job	-2	-6	-6	-2	-6	-4		-6	-2	
<b>PRO-SOCIAL ASSOCIATES</b>	-5	0								
Current positive adult non-family relationships not connected to school or employment										
None										0
One										-1
Two										-2
Three or more										-3
Current pro-social community ties										
None	0	0	0	0	0	0		0		0
Some	-1	-1	-1	-1	-1	-1		-1		-1
Strong	-2	-2	-2	-2	-2	-2		-2		-2
<b>ANTI-SOCIAL ASSOCIATES</b>	-4	6								
Current friends/companions youth spends time with										
Only pro-social friends	-4	-3	-2	-3	-1	-2	-1	-1	-2	-1
No consistent friends or companions/mix of pro-social and anti-social friends	0	0	0	0	0	0	0	0	0	0
Only anti-social friends	4	3	2	3	1	2	1	1	2	1
Gang member/associate	8	6	4	6	2	4	2	2	4	2
Currently admires/ emulates anti-social peers										
Does not admire	-4	-3	-2	-3	-1	-2	-1	-1	-2	-1
Somewhat admires	4	3	2	3	1	2	1	1	2	1
Admires, emulates	8	6	4	6	2	4	2	2	4	2
Current resistance to anti-social peer influence										
Does not associate with anti-social peers	-8	-6	-4	-6	-2	-4	-2	-2	-4	-2
Usually resists	-4	-3	-2	-3	-1	-2	-1	-1	-2	-1
Rarely resists	4	3	2	3	1	2	1	1	2	1
Leads anti-social peers	8	6	4	6	2	4	2	2	4	2
<b>SINGLE ITEMS</b>										
Current employment status										
Not currently employed										0
Employment going well										-1
Problems with employment										1
Currently in a "romantic," intimate, or sexual relationship										
Not romantically involved	0	0	0		0					

Romantically involved: pro-social person	-2	-1	-1		-1					
Romantically involved: anti-social person	2	1	1		1					
<b>RESULTS</b>										
AUC	0.62	0.63	0.6	0.6	0.6	0.6	0.62	0.57	0.59	0.59
Cut point										
Low-Moderate	-10	0	-7	-5	-5	-7	0	1	-8	-5
Moderate-High	12	5	3	7	3	4	4	4	7	3
Population %										
Low	19	44	23	33	19	24	48	54	14	34
Moderate	59	22	49	43	69	71	45	41	72	61
High	22	33	27	25	12	5	8	5	14	5
Recidivism %										
Low	38	16	14	20	5	34	8	12	30	3
Moderate	54	24	22	31	9	45	13	17	21	5
High	68	33	30	38	14	60	20	20	13	8
Gender-neutral base rate	34	16	14	19	5	34	16	14	19	5

Family Needs Model											
Male						Female					
	Any	Felony	Violent	Property	Drug	Any	Felony	Violent	Property	Drug	
Min	Max										
<b>FAMILY MEMBER PROBLEM</b>											
Current family members in jail/prison											
Mother/female caretaker	1	3	1	1	1	1			1	1	
Father/male caretaker	1	3	1	1	1	1			1	1	
Sibling	1	3	1	1	1	1			1	1	
Other family member	1	3	1	1	1	1			1	1	
Problem of parent who are currently involved with the household											
No parent, none in household, or no problem	0			0		0			0	0	
Alcohol problem	1			1		1			1	1	
Drug problem	1			1		1			1	1	
Mental health problem	1			1		1			1	1	
Physical health problem	1			1		1			1	1	
Employment problem	1			1		1			1	1	
Problem with siblings who are currently involved with the household											
No siblings, none in household, or no problem	0			0		0	0	0	0	0	
Alcohol problem	1			1		1	1	1	1	1	
Drug problem	1			1		1	1	1	1	1	
Mental health problem	1			1		1	1	1	1	1	
Physical health problem	1			1		1	1	1	1	1	
Employment problem	1			1		1	1	1	1	1	
<b>RESIDENTIAL STABILITY</b>											
Annual combined income of youth and family											
Under \$15,000	2	2	2	2		2	2	2	2	2	
\$15,000 to \$34,999	1	1	1	1		1	1	1	1	1	
\$35,000 to \$49,999	-1	-1	-1	-1		-1	-1	-1	-1	-1	
\$50,000 and over	-2	-2	-2	-2		-2	-2	-2	-2	-2	
Youth is currently living with (protective)											
Alone	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	
Mother	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	
Dad	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	
Sibling	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	
Grandparent	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	
Youth is currently living with (risk)											

Transient	1	1	1	1	1	1	1	1	1
Foster/Group Home	1	1	1	1	1	1	1	1	1
<b>FAMILY SUPPORT</b>	-4	5							
Support network for family									
None				0	0				0
Some				-1	-1				-1
Strong				-2	-2				-2
Family willingness to help support of youth									
Willing to support					-1				-1
Inconsistently supports					1				1
Not willing to support					2				2
Hostile, berating, belittling					3				3
Family provides opportunities for youth to participate in family activities and decisions									
None			2		2				2
Some			1		1				1
Opportunities			-1		-1				-1
<b>FAMILY PARENTING SKILLS</b>	-5	8							
Parental supervision									
Consistent, good			-2	-1	-1	-1	-1	-1	-1
Sporadic			2	1	1	1	1	1	1
Inadequate			4	2	2	2	2	2	2
Parental authority and control									
Usually follows family rules			-2	-1	-1	-1	-1	-1	-1
Sometimes follows family Rules			2	1	1	1	1	1	1
Consistently disobeys Family			4	2	2	2	2	2	2
Hostile toward family			4	2	2	2	2	2	2
Consistent appropriate punishment for bad behavior									
Consistently appropriate			-2	-1	-1	-1	-1	-1	-1
Consistently overly severe			2	1	1	1	1	1	1
Consistently insufficient			2	1	1	1	1	1	1
Inconsistent or erratic			4	2	2	2	2	2	2
Consistent appropriate rewards for good behavior									
Consistently appropriate			-2	-1	-1	-1	-1	-1	-1
Consistently overly indulgent/overly protective			2	1	1	1	1	1	1
Consistently insufficient			2	1	1	1	1	1	1
Inconsistent or erratic			4	2	2	2	2	2	2
Parental characterization of youth's anti-social behavior									
Parents disapprove			-2	-1	-1	-1	-1	-1	-1
Parents minimize/excuse			2	1	1	1	1	1	1
Parents okay with			2	1	1	1	1	1	1
Parents proud			4	-2	-2	-2	-2	-2	-2
<b>FAMILY CONFLICT</b>	-7	6							
Youth has run away or been kicked out of home:									
No run away/kicked out			-1	-1	-2	-1	-1	-1	-1
Runaway/kicked out			1	1	2	1	1	1	1
Currently a runaway/kicked Out			2	2	4	2	2	2	2
Family member(s) youth feels close to or has good relationship with									
None			1	1	2	1	1	1	1
Mother/female caretaker			-1	-1	-2	-1	-1	-1	-1
Father/male caretaker			-1	-1	-2	-1	-1	-1	-1
Male sibling			-1	-1	-2	-1	-1	-1	-1
Female sibling			-1	-1	-2	-1	-1	-1	-1
Extended family			-1	-1	-2	-1	-1	-1	-1

Level of conflict between parents, between youth and parents, among siblings										
Some family conflict: well Managed	-1	-1	-2		-1	-1	-1	-1	-1	
Verbal intimidation, Arguments	1	1	2		1	1	1	1	1	
Threats of physical abuse	2	2	4		2	2	2	2	2	
Domestic violence: physical/sexual abuse	3	3	6		3	3	3	3	3	
<b>RESULTS</b>										
AUC	0.59	0.57	0.59	0.58	0.55	0.56	0.56	0.59	0.54	0.57
Cut point										
Low-Moderate	-4	-1	-5	-4	-6	2	5	3	6	5
Moderate-High	16	9	7	10	6	13	13	7	13	13
Population %										
Low	11	20	16	21	11	21	44	54	41	41
Moderate	69	59	55	59	65	69	54	42	55	49
High	20	21	29	20	24	10	2	4	4	10
Recidivism %										
Low	35	16	14	20	6	34	10	12	19	4
Moderate	55	24	22	31	9	44	13	17	23	5
High	63	30	28	35	11	51	15	22	26	8
Gender-neutral base rate	34	16	14	19	5	34	16	14	19	5

#### Alcohol & Drug Needs Model

			Male					Female			
	Any	Felony	Violent	Property	Drug	Any	Felony	Violent	Property	Drug	
	Min	Max									
DEPENDENCE	0	4									
Current Alcohol use: Requires greater quantities to get high											
No				0	0		0	0	0	0	
Yes				1	1		1	1	1	1	
Current Drug use: Requires greater quantities to get high											
No				0	0		0	0	0	0	
Yes				1	1		1	1	1	1	
Current Alcohol use: Withdrawal symptoms											
No				0	0		0	0	0	0	
Yes				1	1		1	1	1	1	
Current Drug use: Withdrawal symptoms											
No				0	0		0	0	0	0	
Yes				1	1		1	1	1	1	
ABUSE	-4	10									
History of attending alcohol/drug education classes for an alcohol/drug problem:											
Never attended			0	0	0	0	0	0	0	0	
Voluntarily attended			-6	-3	-3	-3	-3	-3	-3	-3	
Parent, school directed			-4	-2	-2	-2	-2	-2	-2	-2	
Court directed			-2	-1	-1	-1	-1	-1	-1	-1	
History of participating in alcohol/drug treatment program											
Never participated			0	0	0	0	0	0	0	0	
Participated once			-1	-1	-1	-1	-1	-1	-1	-1	
Participated several times			-1	-1	-1	-1	-1	-1	-1	-1	
Current Alcohol use: Alcohol disrupts education											
No			0	0	0	0	0	0	0	0	
Yes			1	1	1	1	1	1	1	1	
Current Alcohol use: Alcohol causes family conflict											
No			0	0	0	0	0	0	0	0	
Yes			1	1	1	1	1	1	1	1	

Current Alcohol use: Alcohol interferes with pro-social friendships										
No	0	0	0	0	0	0	0	0	0	0
Yes	1	1	1	1	1	1	1	1	1	1
Current Alcohol use: Alcohol causes health problems										
No	0	0	0	0	0	0	0	0	0	0
Yes	1	1	1	1	1	1	1	1	1	1
Current Alcohol use: Alcohol contributes criminal behavior										
No	0	0	0	0	0	0	0	0	0	0
Yes	1	1	1	1	1	1	1	1	1	1
Current Drug use: Drug disrupts education										
No	0	0	0	0	0	0	0	0	0	0
Yes	1	1	1	1	1	1	1	1	1	1
Current Drug use: Drug causes family conflict										
No	0	0	0	0	0	0	0	0	0	0
Yes	1	1	1	1	1	1	1	1	1	1
Current Drug use: Drug interferes with pro-social friendships										
No	0	0	0	0	0	0	0	0	0	0
Yes	1	1	1	1	1	1	1	1	1	1
Current Drug use: Drug causes health problems										
No	0	0	0	0	0	0	0	0	0	0
Yes	1	1	1	1	1	1	1	1	1	1
Current Drug use: Drug contributes criminal behavior										
No	0	0	0	0	0	0	0	0	0	0
Yes	1	1	1	1	1	1	1	1	1	1
<b>HEALTH PROBLEM</b> 0 6										
Type of (hard) drugs currently used										
Amphetamines		1	1	1	1	1	1		1	1
Cocaine (coke)/Cocaine (crack/rock)		1	1	1	1	1	1		1	1
Heroin		1	1	1	1	1	1		1	1
Other (not including marijuana or alcohol)		1	1	1	1	1	1		1	1
Current Alcohol use: Alcohol causes health problems										
No		0	0	0	0	0	0		0	0
Yes		1	1	1	1	1	1		1	1
Current Drug use: Drug use causes health problems last										
No		0	0	0	0	0	0		0	0
Yes		1	1	1	1	1	1		1	1
<b>SINGLE ITEMS</b>										
Type of (hard) drugs currently used										
Amphetamines		2							1	
Cocaine (coke)/Cocaine (crack/rock)		2							1	
Heroin		2							1	
Other (not including marijuana or alcohol)		2							1	
<b>RESULTS</b>										
AUC	0.57	0.56	0.52	0.55	0.6	0.56	0.57	0.52	0.53	0.65
Cut point										
Low-Moderate	-1	-1	-1	-1	-1	-1	0	4	4	4
Moderate-High	10	7	8	6	5	8	10	12	10	8
Population %										
Low	29	36	36	36	36	35	42	65	64	64
Moderate	51	52	56	47	42	54	52	34	30	24
High	20	11	8	16	22	10	6	1	6	12

Recidivism %											
Low	44	18	20	25	5	36	9	14	20	3	
Moderate	56	26	23	31	10	45	13	15	23	7	
High	61	30	26	36	12	50	16	19	26	8	
Gender-neutral base rate	34	16	14	19	5	34	16	14	19	5	

Mental Health Needs Model											



No current mental health problem(s)			0			0	0	0	0	0
Current mental health problem(s)			1			1	1	3	1	1
<b>RESULTS</b>										
AUC	0.5	0.5	0.54	0.52	0.5	0.5	0.53	0.56	0.51	0.51
Cut point										
Low-Moderate	1	1	1	1	1	1	1	1	1	1
Moderate-High	3	4	3	4	6	5	5	6	5	5
Population %										
Low	68	68	68	68	68	61	61	61	61	61
Moderate	25	28	25	28	31	33	33	27	33	33
High	7	3	7	3	1	6	6	12	6	6
Recidivism %										
Low	53	23	20	28	8	42	10	12	20	4
Moderate	55	24	25	32	8	43	12	18	22	4
High	57	26	30	33	12	46	14	20	24	8
Gender-neutral base rate	34	16	14	19	5	34	16	14	19	5

Note: \*This item comes from the School domain, please consider using for a general responsivity factor. \*\*Please consider using for a general responsivity factor.

Attitudes Needs Model											
	Male						Female				
	Any	Felony	Violent	Property	Drug		Any	Felony	Violent	Property	Drug
	Min	Max									
<b>BELIEFS</b>	-6	6									
Optimism											
High aspirations: sense of purpose, commitment to better life	-4	-2	-2	-4	-2	-4	-2	-2	-2	-2	-2
Normal aspirations: some sense of purpose	2	1	1	2	1	2	1	1	1	1	1
Low aspirations: little sense of purpose or plans for better	2	1	1	2	1	2	1	1	1	1	1
Believes nothing matters: he or she will be dead before long	4	2	2	4	2	4	2	2	2	2	2
Impulsive; acts before thinking											
Uses self-control: usually thinks before acting	-4	-2	-2	-4	-2	-4	-2	-2	-2	-2	-2
Uses some self-control: sometimes thinks before acting	2	1	1	2	1	2	1	1	1	1	1
Impulsive: often acts before thinking	2	1	1	2	1	2	1	1	1	1	1
Highly impulsive: usually acts before thinking	4	2	2	4	2	4	2	2	2	2	2
Belief in control over antisocial behavior:											
Believes can stop anti-social behavior	-2	-1	-1	-2	-1	-2	-1	-1	-1	-1	-1
Somewhat believes can stop anti-social behavior	0	0	0	0	0	0	0	0	0	0	0
Believes cannot stop anti-social behavior	2	1	1	2	1	2	1	1	1	1	1
Youth's belief in successfully meeting conditions of court supervision:											
Believes will be successful under supervision	-2	-1	-1	-2	-1	-2	-1	-1	-1	-1	-1
Unsure of success under supervision	0	0	0	0	0	0	0	0	0	0	0
Does not believe will be successful under supervision	2	1	1	2	1	2	1	1	1	1	1
<b>PERCEPTION OF OTHERS</b>	-12	13									

Empathy, remorse, sympathy, or feelings for the victim(s) of criminal behavior										
Has empathy	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2
Has some empathy	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
Does not have empathy	2	2	2	2	2	2	2	2	2	2
Respect for property of others										
Respects property of others	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2
Respects personal, not publicly accessible, property	1	1	1	1	1	1	1	1	1	1
Conditional respect for personal property	2	2	2	2	2	2	2	2	2	2
No respect for personal/public property	3	3	3	3	3	3	3	3	3	3
Respect for authority figures										
Respects most authority figures	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2
Does not respect authority figures	1	1	1	1	1	1	1	1	1	1
Resents most authority figures	2	2	2	2	2	2	2	2	2	2
Defies/hostile toward most authority figures	3	3	3	3	3	3	3	3	3	3
Attitude toward pro-social rules/conventions in society										
Believes pro-social rules apply	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2
Believes pro-social rules sometimes apply	1	1	1	1	1	1	1	1	1	1
Does not believe pro-social rules apply	2	2	2	2	2	2	2	2	2	2
Resents or is defiant toward rules	3	3	3	3	3	3	3	3	3	3
Accepts responsibility for anti-social behavior										
Accepts responsibility for behavior	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
*Hostile interpretation of actions and intentions of others in a common nonconfrontational setting										
Primarily positive view	2	2	2	2	2	2	2	2	2	2
Primarily negative view	1	1	1	1	1	1	1	1	1	1
Primarily hostile view	2	2	2	2	2	2	2	2	2	2
<b>MOTIVATION</b>	-1	9								
Primary emotion when committing last crime(s) within the last 6 months										
Nervous, afraid, worried, uncertain	-5	-5	-1	-4	-2	-3	-2	-2	-2	-2
Excited, or stimulated	5	5	1	4	2	3	2	2	2	2
Confident/bragging	5	5	2	4	2	3	2	4	2	2
Primary purpose for committing crime(s) within the last 6 months										
Revenge/Power	5	5	16	4	2	3	2	13	2	2
Impulse	5	5	10	4	2	3	2	3	2	2
Money, material gain, drugs	5	5	9	4	2	3	2	1	2	2
Excitement, amusement	5	5	7	4	2	3	2	2	2	2
Status, acceptance, attention	5	5	10	4	2	3	2	4	2	2
Accepts responsibility for anti-social behavior										
Accepts own anti-social behavior as okay	5	5	2	4	2	3	2	1	2	2
Proud of own anti-social behavior	5	5	6	4	2	3	2	2	2	2
<b>RESULTS</b>										
AUC	0.6	0.6	0.61	0.6	0.56	0.59	0.61	0.64	0.59	0.58
Cut point										

Low-Moderate	-5	5	-1	0	-7	1	3	0	7	0
Moderate-High	14	13	14	15	6	15	13	16	12	10
Population %										
Low	6	26	11	23	5	35	54	32	67	28
Moderate	66	45	65	57	70	52	43	63	24	57
High	28	28	24	20	25	13	3	5	9	15
Recidivism %										
Low	34	16	16	20	7	35	8	10	19	4
Moderate	52	23	21	30	8	45	15	16	26	5
High	64	32	28	40	11	55	19	28	30	6
Gender-neutral base rate	34	16	14	19	5	34	16	14	19	5

Note: \*This item is from the Aggression domain.

Aggression Needs Model											
Male						Female					
		Any	Felony	Violent	Property	Drug	Any	Felony	Violent	Property	Drug
Min	Max										
<b>AGGRESSION BELIEFS</b>											
Tolerance for frustration											
Rarely gets upset/temper tantrums		-2	-2	-2	-2	-2	-2	-2	-2	-2	
Sometimes gets upset/temper tantrums		1	1	1	1	1	1	1	1	1	
Often gets upset/temper tantrums		2	2	2	2	2	2	2	2	2	
Hostile interpretation of actions and intentions of others in a common non-confrontational setting:											
Primarily positive view of intentions of others		-2	-2	-2	-2	-2	-2	-2	-2	-2	
Primarily negative view of intentions of others		1	1	1	1	1	1	1	1	1	
Primarily hostile view of intentions of others		2	2	2	2	2	2	2	2	2	
Belief in yelling and verbal aggression to resolve a disagreement or conflict											
Believes verbal aggression is rarely appropriate		-2	-2	-2	-2	-2	-2	-2	-2	-2	
Believes verbal aggression is sometimes appropriate		1	1	1	1	1	1	1	1	1	
Believes verbal aggression is often appropriate		2	2	2	2	2	2	2	2	2	
Belief in fighting and physical aggression to resolve a disagreement or conflict											
Believes physical aggression is never appropriate		-2	-2	-2	-2	-2	-2	-2	-2	-2	
Believes physical aggression is rarely appropriate		-1	-1	-1	-1	-1	-1	-1	-1	-1	
Believes physical aggression is sometimes appropriate		2	2	2	2	2	2	2	2	2	
Believes physical aggression is often appropriate		3	3	3	3	3	3	3	3	3	
Reports/evidence of violence not included in criminal history											
Violent destruction of property		1	1	1	1	1	1	1	1	1	
Violent outbursts, displays of temper, uncontrolled anger indicating potential for harm		1	1	1	1	1	1	1	1	1	
Deliberately inflicted physical pain		1	1	1	1	1	1	1	1	1	
Used/threatened with a weapon		1	1	1	1	1	1	1	1	1	
Fire starting reports		1	1	1	1	1	1	1	1	1	
Animal cruelty reports		1	1	1	1	1	1	1	1	1	
*Control of aggression											

Never a problem with aggression	-1	-1	-1	-1	-1	-1	-1	-1	-1
Lacks alternatives to aggression	1	1	1	1	1	1	1	1	1
Rarely uses alternatives to aggression	1	1	1	1	1	1	1	1	1
Sometimes uses alternatives to aggression	1	1	1	1	1	1	1	1	1
Often uses alternatives to aggression	1	1	1	1	1	1	1	1	1
<b>SINGLE ITEMS</b>									
Reports/evidence of sexual aggression not included in criminal history									
No reports								-1	
Reports of sex for power/aggressive sex			1			3			9 5
Reports of child sex/young sex partners							3	3	5
Reports of voyeurism									9
Reports of exposure			2				1	2	6
**Primary purpose for committing crime(s) within the last 6 months									
Anger			15					9	
<b>RESULTS</b>									
AUC	0.58	0.57	0.63	0.57	0.52	0.57	0.57	0.64	0.56 0.51
Cut point									
Low-Moderate	0	-3	1	-3	-5	0	0	0	0
Moderate-High	8	8	12	10	10	10	8	12	10 10
Population %									
Low	28	14	28	14	8	24	24	23	24 18
Moderate	60	74	50	83	89	73	62	57	73 78
High	12	12	22	3	3	3	14	20	4 4
Recidivism %									
Low	46	16	14	21	7	35	5	7	16 4
Moderate	56	24	24	31	9	44	12	14	22 4
High	64	30	28	39	10	59	16	24	27 5
Gender-neutral base rate	34	16	14	19	5	34	16	14	19 5

Note: \*This item is from the Skills domain. \*\*This item is from the Attitudes/Behavior domain.

Skills Needs Model										
		Male					Female			
		Any	Felony	Violent	Property	Drug	Any	Felony	Violent	Property Drug
Min	Max									
<b>FUTURE PERCEPTIONS</b>										
Consequential thinking										
Does not understand about consequences of actions		1	1	1	1	1	1	1	1	1
Understands about consequences to actions		-1	-1	-1	-1	-1	-1	-1	-1	-1
Identifies consequences of actions		-2	-2	-2	-2	-2	-2	-2	-2	-2
Good consequential thinking and acting		-3	-3	-3	-3	-3	-3	-3	-3	-3
Goal setting										
Does not set any goals		2	2	2	2	2	2	2	2	2
Sets unrealistic goals		1	1	1	1	1	1	1	1	1
Sets somewhat realistic goals		-1	-1	-1	-1	-1	-1	-1	-1	-1
Sets realistic goals		-2	-2	-2	-2	-2	-2	-2	-2	-2
Problem-solving										
Cannot identify problem behaviors		1	1	1	1	1	1	1	1	1
Identifies problem behaviors		-1	-1	-1	-1	-1	-1	-1	-1	-1
Thinks of solutions for problem behaviors		-2	-2	-2	-2	-2	-2	-2	-2	-2
Applies appropriate solutions to problem behaviors		-3	-3	-3	-3	-3	-3	-3	-3	-3
Situational perception										

Cannot analyze the situation for use of a prosocial skill	1	1	1	1	1	1	1	1	1	1
Does not choose the best pro-social skill	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
Chooses best skill but not best time and place	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2
Selects the best time and place for best skill	-3	-3	-3	-3	-3	-3	-3	-3	-3	-3
<b>COPING</b>										
Dealing with others										
Lacks basic social skills in dealing with others	1	1	1	1	1	1	1	1	1	1
Lacks advanced skills in dealing with others	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
Sometimes uses advanced social skills in dealing with others	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2
Often uses advanced social skills in dealing with others	-3	-3	-3	-3	-3	-3	-3	-3	-3	-3
Dealing with difficult situations										
Lacks skills in dealing with difficult situations	2	2	2	2	2	2	2	2	2	2
Rarely uses skills in dealing with difficult situations	1	1	1	1	1	1	1	1	1	1
Sometimes uses skills in dealing with difficult situations	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
Often uses skills in dealing with difficult situations	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2
Dealing with feelings/emotions										
Lacks skills in dealing with difficult situations	2	2	2	2	2	2	2	2	2	2
Rarely uses skills in dealing with difficult situations	1	1	1	1	1	1	1	1	1	1
Sometimes uses skills in dealing with difficult situations	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
Often uses skills in dealing with difficult situations	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2
<b>PRECIPITOUS ACTIONS</b>										
Monitoring of internal triggers										
Cannot identify internal triggers	1	1		1	1	1	1		1	1
Identifies internal triggers	-1	-1		-1	-1	-1	-1		-1	-1
Actively monitors/controls internal triggers	-2	-2		-2	-2	-2	-2		-2	-2
Monitoring of external triggers										
Cannot identify external Triggers	1	1		1	1	1	1		1	1
Identifies external triggers	-1	-1		-1	-1	-1	-1		-1	-1
Actively monitors/controls external triggers	-2	-2		-2	-2	-2	-2		-2	-2
Control of impulsive behaviors that get youth into trouble										
Never a problem with impulsive behavior	-3	-3	-3	-3	-3	-3	-3	-3	-3	-3
Lacks techniques to control impulsive behavior	1	1	1	1	1	1	1	1	1	1
Knows techniques to control impulsive behavior	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
Uses techniques to control impulsive behavior	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2
<b>RESULTS</b>										
AUC	0.55	0.55	0.57	0.57	0.53	0.56	0.57	0.6	0.57	0.52
Cut point										
Low-Moderate	-11	-5	-7	-7	-7	-5	-4	-4	-4	-4
Moderate-High	9	10	8	7	6	8	8	8	7	6
Population %										
Low	14	34	23	23	23	32	35	35	35	35

Moderate	73	56	66	63	59	58	90	55	52	48
High	13	10	11	14	18	10	5	9	12	16
Recidivism %										
Low	46	19	17	22	8	36	8	10	17	3
Moderate	55	26	23	31	9	45	13	16	23	4
High	59	27	27	35	10	51	15	24	27	5
Gender-neutral base rate	34	16	14	19	5	34	16	14	19	5