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Predicting youth assault and institutional danger in juvenile correctional facilities

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1. Introduction

Incidences of violence in juvenile correctional facilities can create problems such as physical and psychological harm, facility instability, longer lengths of stay and parole denials for youth, and ultimately, civil and criminal liabilities (Griffith, Daffern, & Godber, 2013; Deitch, Madore, Vickery, & Welch, 2013). Correctional administrators frequently use risk assessment instruments to identify risk factors that can be modified by evidence-based interventions to reduce the likelihood of future violence or misconduct in youth (Morris, Longmire, Buffington-Vollum, & Vollum, 2010; Schenk & Fremouw, 2012). Risk assessment instruments also play a fundamental role in determining the manner in which offenders are classified according to custody level, security level, and how correctional officers supervise offenders. While there are many benefits to using risk assessment instruments, their ability to accurately identify the risk of violence is only as good as its predictive validity.

Predictive validity refers to the ability of an instrument to accurately assess the probability of violence or recidivism (Singh, 2013). Risk assessments with high levels of predictive validity can increase juvenile justice agencies' capacity to make informed decisions regarding classification, interventions, and allocation of resources across racial/ethnic and gender groups (Vincent, Chapman, & Cook, 2011; Schwalbe, 2008). On the other hand, risk assessments with low levels of predictive validity can produce higher rates of classification errors, misdirect juvenile justice agency resources, and may be no better than professional judgment (Krysik & LeCroy, 2002). More importantly, when risk assessments do not reliably predict outcomes across racial/ethnic, gender, and age groups, their predictive validity can differ by race/ethnicity, gender, and age (Rembert, Henderson, & Pirtle, 2014). Thus, exacerbating disparities within the juvenile justice system, which is far from conclusive evidence (see, for example, Whiteacre, 2006; Onifade, Davidson, & Campbell, 2009; McCafferty, 2016).

Regarding the 120 different risk assessment instruments used in criminal justice and psychiatric settings, investigations of their predictive validity have produced sizable literature in recent years (Singh & Fazel, 2010). The information obtained from predictive validity studies is useful to researchers and practitioners in understanding the strengths and weaknesses of risk assessment instruments' ability to accurately predict adverse outcomes. Considering that there is limited empirical knowledge on the community-based Positive Achievement Change Tool-Prescreen's (PACT-PS), the goal of this study was to explore it's predictive validity for youth assault and institutional danger among state committed male youth and at the request of the Youth Correctional System (YCS; a pseudonym; confidentiality was a condition for obtaining data from the agency).

The PACT-PS was selected for evaluation for two reasons. First, this research proposes a promising avenue for future research that could have a significant practical impact on classification. For example, while the Residential-PACT, which is part of the PACT Tools, does not produce an overall risk to reoffend score. Juvenile correctional agencies have to rely on non-PACT tools or other risk assessment instruments to identify the appropriate level of restrictiveness within which supervision will be delivered. Therefore, the central question is whether the PACT-PS will successfully predict institutional misconduct. One study has already provided evidence to this question (Rembert, Henderson, Threadcraft-Walker, & Simmons-Horton, 2017), but there is still more research that needs to be performed to understand the PACT-PS overall effectiveness in a correctional setting. Second, the PACT-PS contains measures of importation theory, which are frequently used when examining youth assault in the juvenile institutional misconduct and risk prediction literatures.

2. Correlates of youth assault in juvenile corrections

Researchers have often selected correlates of youth assault based on the importation model. Irwin and Cressey (1962) proposed the importation model of adjustment, arguing that offender behavior is best explained by antisocial behaviors, values, and beliefs offenders develop in the community and import into the prison environment. For example, if an individual was convicted and sentenced for larceny, it is likely he or she will do the same while incarcerated. These pre-prison offender characteristics are considered risk factors at intake and used to determine inmate needs or treatment planning during incarceration (Hannah-Moffat, 2005). Also, pre-prison offender characteristics are

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often used in prison policies, classification, security levels, and treatment decisions (Moloney, van den Bergh, and Moller, 2009). To the best of our knowledge, only four research studies have empirically examined the relationship between importation variables for both youth assault and composite measures of youth assault among state committed youth.

Blackburn and Trulson (2010) examined the relationship between several importation variables for both youth assault and major rule violations (i.e., behaviors include but not limited to chunking bodily fluids, possession of a weapon, staff assaults, youth assaults, and rioting) among 139 serious and violent female youth who were committed under a blended sentencing statute in the Youth Correctional System. Using negative binomial estimates, they found that Blacks, gang-affiliated youth, and mental disorders were associated with youth assaults. Consistent with the adult and juvenile literature, younger youth at the time of commitment were more likely to engage in major rule violations. Lahm (2017) pointed out that the relationship between race and female institutional misconduct is ambiguous, at best. Some researchers have found that non-White females are more likely to engage in violence than White females (Houser & Welsh, 2014). However, other researchers have found that non-White females are less likely than White females to be written up for minor disciplinary infractions (Drury and DeLisi, 2010). Finally, previous research has established that gang affiliated and mentally ill females are more likely to engage in misconduct compared to their counterparts (DeLisi, Spruill, Peters, Caudill, and Trulson, 2013).

Trulson, DeLisi, Caudill, Belshaw, and Marquart (2010) examined youth assaults and major rule violations among a sample of 2520 serious and violent male state committed youth under the state's blended sentencing statute at the Youth Correctional System. They explored several demographic, criminal history, and social history variables based on importation theory. Using negative binomial regression models, they found that age, Blacks, gang members, mental disorders, out-of-home placements, chaotic home environments, serious person/property offenses, sexual-related offenses, and homicide commitment were associated with youth assaults. Except for age at commitment, those with a greater number of previous adjudications, a greater number of previous out-of-home placements, gang members, substance abusers, and those who resided in a chaotic home environment before state commitment were associated with major violations. Trulson et al. (2010) argued that the delinquent history variables provide the greatest explanation of the expected major misconduct rate relative to social history variables. In light of recent studies demonstrating heterogeneity in offender populations and distinct developmental patterns, Cochran and Mears (2017) claim that it is unclear, and that future studies should examine "whether prisoner behavior represents the continuation of a pre-prison criminal career inside the prison walls or if misconduct is unrelated to prior offending patterns" (p. 453).

DeLisi, Beaver, et al. (2010) used data from 791 state committed youth confined to the California Youth Authority to evaluate youth assault, staff assault, and aggressive misconduct. Distress, self-restraint, age, race, sex, commitment offense type, total prior delinquent offenses, and mental health served as independent variables. Using negative binomial regression models, DeLisi, Beaver, et al. (2010) found that age was related to youth assault for both genders. For males, they found that lower self-control was related to youth assault. For females, prior offenses and psychiatric diagnosis emerged as significant predictors of youth assault. Similar results were found for aggressive misconduct and assaults against staff across the gender groups. The authors concluded that the psychosocial profiles for males were different from females and that males had lower self-control than females for institutional misconduct. However, the authors failed to offer an adequate explanation for gender differences related to psychosocial profiles and low self-control when examining youth assault.

DeLisi, Trulson, Marquart, Drury, and Kosloski (2011) examined assault (i.e., any assault against a staff or fellow resident) within the life-course framework using a large sample of state committed youth (n = 2520) from a large Southern state. Four importation domains were examined: race/ethnicity, time served, family background characteristics, and delinquent career characteristics. They found that youth with a greater number of out-of-home placements, living in poverty, violence toward family members, and those with lengthier time served were more likely to engage in any assault. This is the only study that examined the relationship between perpetration of family violence, adverse childhood experiences, and institutional violence.

3. The role community-based risk assessments predicting youth assault in corrections

Several researchers have found that community-based juvenile risk assessments originally designed to predict community outcomes were also predictive for a wider range of youthful offenders and recidivistic outcomes in institutional settings. For example, the Massachusetts Youth Screening Instrument-Second Version (MAYSI-2) was originally designed to identify emotional, behavioral, and psychological disturbances among adolescent offenders (Grisso & Barnum, 2006). Butler, Loney, and Kistner (2007) found that the MAYSI-2 angry-irritable subscale, the only subscale out of seven, was significantly correlated with major misconduct for serious rule violations (e.g., aggression toward a peer; r = 0.20) and intensive supervision placements (e.g., acute and severe threat to self or others; r = 0.28). DeLisi, Caudill, et al. (2010) and DeLisi, Drury, et al. (2010) presented several modifications of Poisson and negative binomial models for count data. Both studies examined the MAYSI-2 subscales to predict assaultive behavior in a sample of 813 youth committed to the California Youth Authority between 1997 and 1999. Somatic complaints, anger-irritability, traumatization, prior adjudications, younger youth, and White youth emerged as significant predictors of sexual misconduct. Anger-irritability, total prior offenses, and younger youth were significantly related to staff assaults (see DeLisi, Caudill, et al., 2010). Youths with elevated anger-irritability scores and younger youth were more likely to assault other youth. Anger-irritable, substance abuse, somatic complaints, and traumatization were significantly related to total incidents of misconduct (see DeLisi, Drury, et al., 2010). One major drawback of these studies is that some failed to use ROC curve analysis, which is the preferred statistical technique because it is less sensitive to base rates (Rice & Harris, 2005).

Another example is the Youth Level of Service/Case Management Inventory (YLS/CMI) originally developed for juvenile probation officers to assist them with classification and case management planning (Bechtel, Lowenkamp, & Latessa, 2007). One study by Holsinger, Lowenkamp, and Latessa (2006) found that number of days spent in the institution and total risk score were positively and significantly associated with high- and greatest-misconduct (e.g., assault without a weapon, sexual assault, physical assault, verbal threat against a correctional worker, and possession of a weapon or firearm). Days spent in the institution and total risk score explained 21% of the variance in high misconduct and 35% of the variance in greatest misconduct. The main limitation of this study was their small sample size of 80, which prevented further analysis of additional variables and generalizability of their results. Holsinger and colleagues failed to provide information on the racial composition of their sample. Finally, and in brief, the Psychopathy Checklist: Youth Version (PCL-YV) was designed to measure psychopathic traits in adolescents (Forth, Kosson, & Hare, 2003), yet it is commonly used to identify youth at risk for violence, reoffending, and institutional misconduct (Edens & Campbell, 2007; Leistico, Salekin, DeCoster, and Rogers, 2008; Olver, Stockdale, & Wormith, 2009).

4. PACT-PS

The PACT-PS is a generalized initial screening instrument designed to predict youths' risk to reoffending. The PACT-PS contains 43-items,

which are unequally distributed throughout four subscales: record of referrals (10 items), social history (21 items), attitudes and behaviors (6 items), and mental health (6 items). The record of referrals and social history subscales are used to determine the youth's risk to reoffend (see Table A1 for a description of each subscale items). The attitudes/behaviors and mental health subscales are used to determine if there is a need to refer youth for further mental health or substance abuse evaluations.

The record of referrals subscale score ranges from 0 to 31, with higher scores indicative of official referral seriousness. The social history subscale score ranges from 0 to 18, with higher scores reflecting more risk factors present in the youth's social environment. Both the record of referrals subscale score and social history subscale score form a matrix, which classifies each youth into one of the four risk levels: low, moderate, moderate-high, or high risk. The PACT-PS recommends the following cutoff points for the record of referrals subscale: 12 and higher is high risk, 9 to 11 is moderate-high risk, 6 to 8 is moderate risk, and 0 to 5 is low risk. The cutoff points for the social history subscale are as follows: 10 and higher is high risk, 6 to 9 is moderate risk, and 0 to 5 is low risk. Based on samples of probationers, several studies have examined the psychometric properties of the PACT scale and subscale scores and supported their use as predictors of subsequent delinquent referrals, rearrests, new convictions, and violations of probation (Baglivio, 2009; Baglivio & Jackowski, 2013; Baird, Healy, Johnson, Bogie, Dankert, and Scharenbroch, 2013; Winokur-Early, Hand, & Blankenship, 2012; Orbis Partners Inc, 2007; Barnoski, 2004; van der Put, Stams, Deković, and van der Laan, 2014).

Only one study has investigated the PACT-PS on a low-risk sample of 787 state committed youth for staff assault in a juvenile correctional setting. Rembert et al. (2017) found that the PACT-PS was unacceptable at distinguishing staff assault for Hispanic and Black youth compared to White state committed youth. They also found that youth with serious delinquent histories (inversely) and prior commitments (inversely) improved the PACT-PS's ability to predict staff assault. This finding is of particular importance because youth committed for nonviolent offenses and no prior commitments were more likely to be written up for assaulting staff than youth with violent offenses and prior commitments. These results corroborate the findings of previous work in the adult institutional misconduct literature (Cunningham & Sorensen, 2007a, 2007b; Lahm, 2009; Cunningham, Sorensen, & Reidy, 2005). While this study has contributed to our understanding of the community-based PACT-PS in a correctional setting, there remains a paucity of evidence on other forms of violent misconduct.

5. The current study

The current study sought to further examine the PACT-PS for youth assault and institutional danger in a correctional setting. Research examining the predictive utility of the PACT-PS and improving its accuracy can assist the YCS in making informed decisions in their efforts to minimize assault. This study was guided by two research questions. First, can the community-based PACT-PS predict youth assault and institutional danger in a correctional setting? Second, can the record of referrals and social history subscale items predict youth assault and institutional danger in a correctional setting?

6. Method

6.1. Participants

This study examined secondary data collected from the Youth Correctional System (YCS) electronic database. Only youth adjudicated and sentenced to serve their time in correctional facilities between February 2009 and June 2010 were eligible for inclusion in this study. At the time of this study, there was 1481 youth in state custody. However, due to a recent lawsuit settlement between YCS and the U.S. Department of Justice, our sample included 787 state committed male youth committed to 9-month lengths of stay in less secure juvenile correctional facilities. All youth were administered the PACT-PS by trained staff when they first entered the YCS. Consistent with the literature, which holds that female pathways to delinquency are inherently different from the pathways into delinquency for males and due to their small sample size, 49 females were excluded from this analysis. Males self-identifying themselves as either Asian ($n = 3$) or "Other" race/ethnicity ($n = 4$), and 18 years old ($n = 1$) were excluded from statistical analysis due to their insufficient sample size. The final sample size consisted of 730 male state committed youth, of which 46% were Hispanic, 35% were Black, and 19% were White. The average age of the sample was 15.63 years. Based on the PACT-PS scale score, 40% of the sample was classified as high risk, 30% moderate-high risk, 18% moderate risk, and 12% low risk. It should be noted that youth placed in less secure facilities is an estimate of escape risk and should not be confused with youth rated as high risk, which is indicative of treatment intensity.

6.2. Measures

The Positive Achievement Change Tool – Prescreen (PACT-PS) is an initial screening instrument designed to predict youths' risk to reoffending. The PACT-PS contains 43-items, which are unequally distributed throughout four subscales: record of referrals (10 items), social history (21 items), attitudes and behaviors (6 items), and mental health (6 items). The record of referrals and social history subscale scores are used to determine the youth risk of reoffending and case management needs. The attitudes/behaviors and mental health subscale scores are used to determine if there is a need to refer youth for further mental health or substance abuse evaluation. All staff is trained in administering the PACT-PS to youth during a 2-day motivational interviewing training, followed by a 3-day theory, risk assessment, and case planning training. Consistent with prior research, the record of referrals subscale score (0 − 31) and social history subscale score (0–18) were summed to form the youth PACT-PS scale score (0–49), with larger values indicating greater risk of reoffending and treatment intensity (Hamilton, van Wormer, & Barnoski, 2015; Rembert et al., 2017). The exact scoring of the record of referrals and social history subscale scores are proprietary to Assessments.com, the vendor of the PACT-PS. The only adjustments we made were to the individual subscale items themselves to promote a clearer interpretation of the odds ratio logistic regression and to maintain confidentiality. Therefore, the record of referrals subscale items (0 = no referral, 1 = one or more referrals) and social history subscale items (0 = risk not present, 1 = risk present) were coded as binary variables; the exception was the age at first offense, which was coded as a continuous variable. The mean and standard deviations for the record of referral items and social history items are listed in Appendix A.

This study examined two outcome measures of risk of reoffending: youth assault and institutional danger. Youth assault is a dichotomous variable operationalized as whether or not a youth was written up for a disciplinary infraction involving an assault against another youth (0 = no, 1 = yes). Institutional danger is a composite dichotomous variable operationalized as whether or not a youth was written up for a disciplinary infraction involving an assault against staff, another youth, and/or possession of a weapon on at least one occasion during their confinement (0 = no, 1 = yes). We used binary outcome measures rather than assault counts because few of the youth were written up for multiple assaults within the 9-month follow-up period subsequent to the initial assessment. These outcome measures were chosen for several reasons. First, few validation studies of generalized juvenile risk assessments have not dealt with the prediction of assaultive behavior in juvenile correctional settings. Second, in comparison to lesser forms of rule violations (e.g., stealing, extortion, possession of unauthorized items), any form of assault is a serious rule violation, which has a higher

rate of detection and reporting by correctional staff. Third, YCS requested that this study examine these outcome measures to facilitate prevention and intervention strategies.

6.3. Statistical analyses

Predictive validity of the PACT-PS was assessed with Cronbach's alpha, point biserial correlations, receiver operating characteristic (ROC) curves, and hierarchical binominal logistic regression for the sample and each racial/ethnic group. Cronbach's alpha was used to measure the internal consistency of the PACT-PS scales and subscales. We used point biserial correlations to test model assumptions regarding variable relationships. Next, receiver-operating characteristics (ROC) analyses were conducted to examine the predictive accuracy of the PACT-PS scale and subscale scores for youth assault and institutional danger. The ROC produces an area under the curve value (AUC) with values > 0.56 indicating weak predictability, values > 0.64 indicating moderate predictability, and values > 0.71 indicating good predictability (Rice & Harris, 2005). Last, hierarchical binominal logistic regression models were created to examine the predictive power of PACT-PS scale score and items for each outcome measures. A backward stepwise elimination procedure was applied to identify the most influential items for the sample and racial/ethnic groups. The PACT-PS, record of referrals items, and social history items were entered sequentially in 3 blocks: the PACT-PS scale score was entered in the first block; the record of referrals items were entered in the second block, and the social history items were entered in the third block. This particular method was useful in studying the items' cumulative contribution to the variance and identifying predictors associated with each outcome measure. Due to the nature of utilizing a stepwise backward elimination approach, the final models will only be presented for the sake of brevity. A p-value $< .05$ was considered statistically significant for all analyses using version 24.0 of SPSS.

7. Results

7.1. Sample characteristics

Means and standard deviations for age at first offense, PACT-PS scale and subscale scores, risk levels, the severity of committing the offense, and outcome measures are presented in Table 1. There were no significant differences between the racial/ethnic groups for age at first offense. A one-way analysis of variance revealed a significant main effect for race/ethnicity on the PACT-PS scale score ($F(2, 724) = 3.17$, $p < .01$). Bonferroni post hoc analysis revealed that the PACT-PS scale score was significantly higher for Blacks ($M = 18.75$) compared to White state committed youth ($M = 17.32$). Similarly, a one-way analysis of variance revealed a significant main effect for race/ethnicity on the record of referrals subscale score ($F(2, 724) = 5.91$, $p < .01$), with post hoc tests revealing that the record of referrals subscale score was significantly lower for White state committed youth ($M = 10.49$) compared to both Blacks ($M = 11.96$) and Hispanics ($M = 11.50$). No significant differences between the racial/ethnic groups were found for the social history subscale score. A series of chi-square tests of independence revealed no significant differences between the racial/ethnic groups for the PACT-PS risk levels, the severity of committing the offense, and outcome measures.

Table 2
Internal consistency of the PACT-PS

	Sample	Blacks	Hispanics	Whites
PACT-PS Scale (32)	0.66	0.60	0.69	0.70
Record of referrals subscale (10)	0.47	0.44	0.48	0.45
Social history subscale (22)	0.65	0.58	0.67	0.71

Note: Cronbach's alpha coefficients.

7.2. Reliability of the PACT-PS

Table 2 presents the Cronbach's alpha coefficients that were conducted to examine the internal consistency of the PACT-PS scale and subscale scores for the total sample and racial/ethnic groups. Generally, alpha coefficient values 0.70 and higher indicates good internal consistency (Nunnally, 1978). Most of the alpha coefficients for the PACT-PS scale and subscales were < 0.70 for the sample and racial/ethnic groups, ranging from 0.44 to 0.71. For Whites, the alpha coefficients for the PACT-PS scale was 0.70, followed by 0.69 for Hispanics, and 0.60 for Blacks. While the social history scale is a more reliable index of youth's social environment for Whites compared to Blacks and Hispanics, the record of referrals scale was an unreliable index of youth persistence to reoffend for all racial/ethnic groups. The social history subscale had higher alpha coefficients than the record of referrals subscale across all racial/ethnic groups.

Table 1
Sample characteristics

Variable	Sample		Blacks		Hispanics		Whites	
	M	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*
Age at first offense	15.63	(0.976)	15.61	(0.964)	15.68	(0.955)	15.57	(1.05)
PACT-PS								
Total risk score	18.19	(4.95)	18.75	(4.96)	18.12	(4.92)	17.32	(4.93)
Record of referrals score	11.47	(3.74)	11.96	(3.69)	11.50	(3.78)	10.49	(3.66)
Social history score	6.72	(2.66)	6.79	(2.64)	6.63	(2.67)	6.84	(2.69)
Risk levels								
% Low	12		10		12		14	
% Moderate	18		14		18		26	
% Moderate–high	30		33		30		24	
% High risk	40		43		40		36	
Seriousness of current offense								
% State jail	17		18		16		20	
% 3rd degree	27		27		28		26	
% 2nd degree	33		34		32		32	
% 1st degree	23		21		24		22	
Outcome measure								
% Youth assault	26		24		28		24	
% Institutional danger	69		79		68		60	

Table 3
Point-biserial correlations between the PACT-PS scale and subscale scores with youth assault and institutional danger for the sample and racial/ethnic groups

	Youth assault	Institutional danger
Sample		
PACT-PS score	−0.06	0.12**
Record of referrals score	−0.04	0.08*
Social history score	−0.06	0.11**
Black		
PACT-PS score	−0.12	0.02
Record of referrals score	−0.07	0.01
Social history score	−0.12	0.03
Hispanics		
PACT-PS score	−0.03	0.12*
Record of referrals score	−0.04	0.07
Social history score	−0.01	0.12*
Whites		
PACT-PS score	0.01	0.26**
Record of referrals score	0.05	0.21*
Social history score	0.05	0.19*

Note. *$p < .05$.**$p < .01$.

7.3. Bivariate correlations

Table 3 presents the point-biserial correlations between the PACT-PS scale and subscale scores with youth assault and institutional danger for the sample and racial/ethnic groups. The PACT-PS scale and subscale scores did not significantly correlate with youth assault for the sample and racial/ethnic groups. The PACT-PS scale score exhibited statistically significant yet weak and positive correlations with institutional danger for the sample, Hispanics, and Whites, but not for Blacks. The PACT-PS scale score was relatively higher for Whites ($r = 0.26$, $p < .01$) compared to the sample, Blacks, and Hispanics ($r = 0.12$, $p < .01$; $r = 0.02$, $p = ns$; $r = 0.12$, $p < .05$, respectively). The record of referrals subscale scores were significantly and positively correlated with institutional danger for the sample ($r = 0.08$, $p < .05$) and Whites ($r = 0.21$, $p < .05$), but not for Blacks ($r = 0.01$, $p = ns$) and Hispanics ($r = 0.07$, $p = ns$). The social history subscale scores were significantly and positively correlated with institutional danger for the sample ($r = 0.11$, $p < .01$), Hispanics ($r = 0.12$, $p < .05$), and Whites ($r = 0.19$, $p < .05$), but not for Blacks ($r = 0.03$, $p = ns$).

7.4. Receiver operating characteristics

Table 4 presents the receiver-operating characteristics (ROC) analyses used to evaluate the predictive validity of the PACT-PS scale and subscale scores for youth assault. None of the AUC values reached statistical significance for the sample, Hispanics, and Whites, suggesting that the PACT-PS has no discriminatory power in classifying youth into lower or higher risk categories (see Table 4). For Blacks, the AUC values did reach statistical significance, but the PACT-PS had poor discriminatory power in classifying youth into low and high risk categories, with AUC values being < 0.50. All AUC values ranged from 0.40 to 0.55 with 95% confidence intervals containing the chance AUC value of 0.50.

Table 5 presents the receiver-operating characteristics (ROC) analyses used to evaluate the predictive validity of the PACT-PS scale and subscale scores for institutional danger. The discriminative power of PACT-PS scale and subscale scores to classify youth in lower or higher risk categories were weak, with an AUC = 0.56 ($SE = 0.03$, $p < 0.01$, 95% CI [0.515–0.611]) for the PACT-PS scale score, an AUC = 0.54 (SE = 0.03, $p < 0.01$, 95% CI [0.490–0.589]) for the record of referral subscale score, and an AUC = 0.56 (SE = 0.02, $p < 0.01$, 95% CI [0.509–0.603]) for the social history subscale score. For the racial/ethnic groups, the AUC values for the PACT-PS scale and subscale scores did not reach statistical significance for Hispanics and Blacks. For Whites, AUC was 0.65 ($SE = 0.05$, $p < 0.01$, 95% CI [0.546–0.749]) for the PACT-PS scale score, 0.61 ($SE = 0.05$, $p < 0.01$, 95% CI [0.512–0.714]) for the record of referrals subscale score, and 0.58 ($SE = 0.05$, $p < 0.01$, 95% CI [0.484–0.687]) for the social history subscale score. As one would expect, the point-biserial correlations and ROC analyses converge on the same results, which indicates that these results have been successfully cross-validated (Rice & Harris, 2005).

7.5. Multivariate analyses

Hierarchical logistic regression analyses were conducted to examine the effects of the PACT-PS scale score and items with youth assault for the sample and racial/ethnic groups (see Table 6). The first model included only the PACT-PS scale score. Next, we entered the record of the referrals items while controlling for the PACT-PS scale score in the second model. Finally, the social history items were added in the third model while controlling for both the PACT-PS scale score and record of referral items. Only the results from the final models are presented due to the nature that a stepwise backward elimination approach was applied. For the sample and Hispanic youth, none of the predictors reached statistical significance for youth assault. As Table 6 shows, prior felonies ($B = 0.28$), history of alcohol use ($B = 0.57$), and no prior commitments ($B = -0.27$) emerged as significant predictors of youth assault for Black state committed youth. For Whites, history of mental health problems and unsubstantiated cases of child neglect were associated with youth assault, $B = 1.11$ and $B = -1.21$, respectively.

Hierarchical logistic regression analyses were conducted to examine the effects of the PACT-PS scale score and items with institutional danger for the sample and racial/ethnic groups (see Table 7). Youth with higher PACT-PS scale scores ($B = 0.08$), school misconduct ($B = 0.46$), lack of parental control ($B = 0.37$), and history of mental health problems ($B = 0.49$) were associated with institutional danger for the sample. No prior person felonies ($B = -0.25$), prosocial friends ($B = -0.26$), and no history of alcohol use ($B = -0.27$) were associated with institutional danger for the sample. Black state committed youth with poor school attendance ($B = 0.55$), no prior commitments ($B = -0.27$), and no history of jail/imprisonment of persons who were ever involved in the household for at least three months ($B = -0.24$) were more likely to be considered an institutional danger. For Hispanics, higher PACT-PS scale scores ($B = 0.10$) and a lack of parental control ($B = 0.62$) emerged as significant predictors of institutional danger. For Whites, history of mental health problems ($B = 2.45$), no history of jail/imprisonment of persons who were ever involved in the household for at least three months ($B = -0.29$), and no history of sexual abuse/rape ($B = -1.51$) emerged as significant predictors of

Table 4
Area under the curve values for PACT-PS predicting youth assault

	Sample		Blacks		Hispanics		Whites	
	AUC (SE)	CI	AUC (SE)	CI	AUC (SE)	CI	AUC (SE)	CI
PACT-PS	0.465 (0.03)	0.416–0.514	0.419 (0.04)*	0.332–0.505	0.482 (0.04)	0.412–0.551	0.519 (0.06)	0.409–0.629
Record of referrals	0.477 (0.03)	0.429–0.525	0.439 (0.04)*	0.352–0.526	0.475 (0.04)	0.406–0.543	0.548 (0.06)	0.435–0.661
Social history	0.462 (0.03)	0.414–0.510	0.412 (0.04)*	0.330–0.494	0.494 (0.04)	0.424–0.563	0.476 (0.06)	0.361–0.590

Note. *$p < .05$. **$p < .01$. AUC = area under the curve, SE = standard error, and CI = 95% confidence interval.

Table 5
Area under the curve values for PACT-PS predicting institutional danger

	Sample		Blacks		Hispanics		Whites	
	AUC (SE)	CI	AUC (SE)	CI	AUC (SE)	CI	AUC (SE)	CI
PACT-PS	0.563 (0.03)*	0.515–0.611	0.487 (0.04)	0.402–0.572	0.556 (0.04)	0.496–0.636	0.647 (0.05)*	0.546–0.749
Record of referrals	0.539 (0.03)*	0.490–0.589	0.468 (0.05)	0.378–0.558	0.535 (0.04)	0.463–0.606	0.613 (0.05)*	0.512–0.714
Social history	0.556 (0.02)*	0.509–0.603	0.526 (0.04)	0.444–0.607	0.562 (0.04)	0.491–0.632	0.586 (0.05)*	0.484–0.687

Note. AUC = area under the curve, SE = standard error, and CI = 95% confidence interval.
* $p < .01$.

Table 6
Hierarchical logistic regression models of youth assault

	β	*SE*	*Wald*	*p*	OR
Blacks					
Prior felony	0.280	0.130	4.633	0.031	1.324
Prior commitments	−0.273	0.120	5.219	0.022	0.761
Alcohol use	0.566	0.243	5.405	0.020	1.761
Constant	−1.468	0.499	8.641	0.003	0.230
Whites					
Neglect	−1.205	0.590	4.165	0.041	0.300
Mental health problems	1.113	0.486	5.241	0.022	3.045
Constant	−1.690	0.508	11.085	0.001	0.184

Note: This table only reports the final models and significant PACT-PS items due to the nature of the backwards elimination. Blacks: $n = 205$; $\chi^2 = 19.71$, $p = .003$; Cox & Snell $R^2 = 0.092$; Nagelkerke $R^2 = 0.136$; correct classification = 77%. Whites: $n = 105$; $\chi^2 = 11.36$, $p = .010$; Cox & Snell $R^2 = 0.103$; Nagelkerke $R^2 = 0.148$; correct classification = 71%. Sample and Hispanics: None of the PACT-PS items reached statistical significance ($p > .05$).

Table 7
Hierarchical logistic regression models of institutional danger

	β	*SE*	*Wald*	*p*	OR
Sample					
PACT-PS score	0.081	0.032	6.271	0.012	1.084
Prior person felony	−0.249	0.110	5.085	0.024	0.780
School conduct	0.462	0.168	7.547	0.006	1.588
Current friends	−0.266	0.102	6.812	0.009	0.766
Current parental control	0.373	0.180	4.305	0.038	1.452
Alcohol use	−0.266	0.135	3.874	0.049	0.767
Mental health problems	0.490	0.236	4.296	0.038	1.632
Constant	−0.516	0.480	1.157	0.282	0.597
Blacks					
Prior commitments	−0.265	0.124	4.588	0.032	0.767
School attendance	0.557	0.254	4.802	0.028	1.745
HJail3	−0.235	0.092	6.576	0.010	0.790
Constant	1.919	0.598	10.293	0.001	6.811
Hispanics					
PACT-PS score	0.105	0.046	5.323	0.021	1.111
Current parental control	0.618	0.254	5.927	0.015	1.855
Constant	−2.090	0.847	6.092	0.014	0.124
Whites					
HJail3	−0.293	0.140	4.352	0.037	0.746
Sexual abuse/rape	−1.510	0.733	4.241	0.039	0.221
Mental health problems	2.449	0.657	13.899	0.000	11.576
Constant	−0.952	1.169	0.663	0.416	0.386

Note: This table only reports the final models and significant PACT-PS items due to the nature of the backwards elimination. Sample: $n = 575$, $\chi 2 = 48.77$, $p = .00$, Cox & Snell $R^2 = 0.081$, Nagelkerke $R^2 = 0.115$, correct classification = 71%. Blacks: $n = 205$; $\chi^2 = 26.61$, $p = .000$; Cox & Snell $R^2 = 0.122$; Nagelkerke $R^2 = 0.184$; correct classification = 78%. Hispanics: $n = 265$; $\chi 2 = 20.39$, $p = .002$; Cox & Snell $R^2 = 0.074$; Nagelkerke $R^2 = 0.103$; correct classification = 64%. Whites: $n = 105$; $\chi^2 = 41.18$, $p = .000$; Cox & Snell $R^2 = 0.324$; Nagelkerke $R^2 = 0.441$; correct classification = 80%. HJail3 = History of jail/imprisonment of persons who were ever involved in the household for at least 3 months. Current is defined as behaviors occurring within the last six months.

Table A1
Means and standard deviations for the record of referrals and social history items.

Variables	N	Minimum	Maximum	Mean	SD
Record of referrals items					
Age at first offense	709	12	18	15.63	0.976
Misdemeanor referrals	709	0	1	0.332	0.471
Felony referrals	709	0	1	0.392	0.489
Weapon referrals	709	0	1	0.086	0.281
Misdemeanor referrals against persons	709	0	1	0.298	0.458
Felony referrals against persons	709	0	1	0.717	0.451
Confinement orders to state institution	709	0	1	0.931	0.254
Confinement orders to detention	709	0	1	0.722	0.448
Escapes	709	0	1	0.016	0.124
Failure to appear warrants	709	0	1	0.172	0.378
Social history items					
School enrollment	708	0	1	0.186	0.390
School conduct	636	0	1	0.739	0.440
School attendance	634	0	1	0.697	0.460
Academic performance	638	0	1	0.431	0.496
History of friends	730	0	1	0.693	0.461
Current friends	709	0	1	0.690	0.462
Out-of-home placements	709	0	1	0.365	0.482
Running away	709	0	1	0.456	0.498
HJail3	709	0	1	0.645	0.479
HJailC	709	0	1	0.504	0.500
Problem parents	709	0	1	0.444	0.497
Parental control	709	0	1	0.305	0.461
History alcohol of use	709	0	1	0.739	0.439
History drugs of use	709	0	1	0.867	0.339
Current alcohol use	709	0	1	0.072	0.259
Current drug use	709	0	1	0.113	0.317
History of physical abuse	709	0	1	0.337	0.473
History of witnessing violence	709	0	1	0.735	0.442
History of sexual abuse	709	0	1	0.126	0.332
History of neglect	709	0	1	0.207	0.406
History of mental health problems	709	0	1	0.295	0.456

Note: HJail3 = history of jail/imprisonment of persons who were ever involved in the household for at least three months; HJailC = history of jail/imprisonment of persons who are currently involved with the household.

institutional danger.

8. Discussion

While previous research has examined the predictive validity of PACT-PS in community settings (Barnoski, 2004; Orbis Partners Inc, 2007; Baglivio, 2009; van der Put et al., 2014; Baglivio & Jackowski, 2013), only one study has examined this instrument in a juvenile correctional setting (Rembert et al., 2017). A lack of research on the utility of the PACT-PS in a correctional setting is not altogether surprising considering that this instrument was never designed to predict correctional outcomes in the first place. However, research suggests that generalized juvenile risk assessment instruments (e.g., PCL-YV, MAYSI-2, and YLS/CMI) originally designed to predict community outcomes are also predictive for a wider range of youthful offenders and violent outcomes in correctional settings. In addition, when juvenile

correctional agencies are under intense public scrutiny to decrease institutional violence, they will not hesitate to consider validating a preexisting risk assessment instrument, even if the tool is designed to predict probation outcomes (Whiteacre, 2006). Such was the case and at the request of Youth Correctional System (YCS), this study examined whether the community-based PACT-PS designed to predict community outcomes would predict institutional outcomes (i.e., youth assault and institutional danger) using a sample of 730 male state committed youth across race/ethnicity. By examining the predictive accuracy of the PACT-PS in a correctional setting, YCS will be able to increase their ability to identify youth who have the greatest likelihood of assaulting others and to maintain a safe therapeutic correctional environment. There were several major findings of this study. First, the results of this study demonstrated that the PACT-PS scale score did not predict youth assault for the sample. Second, the PACT-PS scale score was more effective at predicting a high severity infraction (i.e., institutional danger) than a moderate severity infraction (i.e., youth assault) for the sample. Third, the PACT-PS performed best for Whites than for Black and Hispanic state committed youth when examining institutional danger.

8.1. Youth assault

There were several possible explanations for why the PACT-PS scale score did not predict youth assault for the sample. The first explanation is that different items, weights, and scoring procedures are required for youth assault as opposed to probation outcomes such as rearrests, reconviction, or technical violations of probation. This finding is important because it emphasizes the need for juvenile correctional agencies to validate their risk assessment instruments to ensure they are functioning as desired for the target population (Gobeil & Blanchette, 2007). If validations of risk assessment instruments are conducted, juvenile correctional agencies can increase their consistency in decision making in classification, case planning, and allocation of scarce resources across racial/ethnic and gender groups (Vincent et al., 2011; Schwalbe, 2008; Schwalbe, Fraser, & Day, 2007). However, juvenile correctional agencies adopting risk assessment instruments without validating them on the target population they serve can produce higher rates of classification errors, misallocate agency resources, and dismantle the levels of trust youth have in the juvenile justice system (Henderson, Wells, Maguire, & Gray, 2010).

Our results are consistent with previous studies demonstrating the inability of risk assessment instruments predicting outcomes for which they were not designed in adult populations (Wright, Clear, & Dickson, 1984; Urbaniok, Endrass, Rossegger, Noll, Gallo, and Angst, 2007; Latessa, Lemke, Makarios, Smith, & Lowenkamp, 2010). Previous studies have shown that institutional risk assessment instruments, inclusive of static risk factors, outperformed community risk assessment instruments that incorporated both static and dynamic risk factors when predicting institutional misconduct in adult samples (Weinrath & Coles, 2003; Makarios & Latessa, 2013). Nevertheless, all of the static and dynamic risk factors in this study did not reach statistical significance for youth assault for the sample. This discrepancy between previous studies and the current study could be related to the assessment of criminal history. While criminal history subscales in previous studies routinely assess offenses for which individuals have been arrested and convicted, the PACT-PS uses official referrals to assess persistence of re-offending, whether or not referrals result in arrests, adjudications, adjudication withheld, diversions, dismissals, or not guilty verdicts. Notwithstanding the inability of the static and dynamic risk items to predict youth assault, this study still offers valuable insight to into the “one size fits all” approach to risk assessments. More research is needed to examine the effects of different types of static and dynamic risk factors on youth assault.

8.2. Institutional danger

The second finding of this study is that the efficacy of the PACT-PS scale score was influenced by the severity of assault for the sample. For instance, this study focused on two forms of assaultive behavior and found that the PACT-PS scale score was not statistically significantly associated with a moderate form of assault (i.e., youth assault), but had modest effects for a more serious form of assault (i.e., institutional danger). This finding has important implications for disciplinary hearing officers who are responsible for imposing sanctions that are consistent with the severity of the rule violations to ensure safety, security, and order maintenance of correctional facilities. In the United States, prison disciplinary programs are based on the principle of proportional justice, which refers to sanctions being proportionate to the severity of the rule violation. Therefore, it could conceivably be hypothesized that hearing officers will impose more severe sanctions for institutional danger than for youth assault and as a way of sending a message to encourage prisoners to obey prison rules. However, with a high rate of false positives for institutional danger, caution must be applied, as the finding suggests that many of these youth classified as high risk will never be written up for institutional danger. Thus, replication is encouraged to validate our findings and to improve our understanding of PACT-PS for institutional danger. We did not have access to disciplinary punishment data to examine the relationship between the severities of sanctions and types of assault (Light, 1990a, 1990b). Future research should continue to examine disaggregated forms of violent disciplinary infractions to improve the predictive validity of the PACT-PS.

8.3. Racial/ethnic differences

The PACT-PS moderately predicted institutional danger for Whites, but had weak effects for Blacks and Hispanics. This is not surprising because the AUC values for the PACT-PS scale and subscale scores indicated a relatively large number of false positives than true positives for minorities compared to Whites for both forms of assaultive behavior. Additional analyses revealed that the PACT-PS scale was more internally consistent among Whites compared to minorities. This result is likely related to the PACT-PS being normed on the behaviors and life experiences of White male youth, which can underestimate the predictive validity of risk screening instruments among minority youth (Schlager & Simourd, 2007). Our results are consistent (Vincent et al., 2011; Rembert et al., 2014, 2017) and inconsistent (Baglivio and Jackowski, 2013; McCafferty, 2016) with previous studies examining the differential predictive validity of risk assessment instruments across racial/ethnic groups. An explanation for this finding is that the risk and needs items predicting recidivism may differ according to race/ethnicity. In the current study, lower AUC values and weak internal consistencies of the PACT-PS for minorities as compared to Whites, underlines this explanation. According to Chenane, Brennan, Steiner, and Ellison (2015), measuring exogenous community-level variables (e.g., neighborhood disadvantage, vacant housing, public assistance, crime rates, and law enforcement surveillance) that are disproportionately distributed across racial/ethnic groups will improve instrument's overall predictive equity and is an area of study for future research.

8.4. Importation theory

The results of this study provided some support for importation theory in explaining youth assault and institutional danger. The most prevalent predictors of both forms of misconduct and across the racial/ethnic groups included the history of mental health problems, prior commitments, and history of jail/imprisonment of persons who were ever involved in the household for at least 3 months. For White state committed youths, history of mental health problems increased the likelihood of youth assault and institutional danger. Our findings are

consistent with previous research examining youth assault (DeLisi, Caudill, et al., 2010; DeLisi, Beaver, et al., 2010; Blackburn & Trulson, 2010), but inconsistent with Trulson's (2007) study, that found no relationship between mental health problems and institutional danger. A possible explanation for this result is that White state committed youth with a history of mental health problems may not be able to cope with the strict, rigid, and stressful prison environment or lack social support compared to other racial/ethnic groups or groups without a history of mental health problems (Silver & Teasdale, 2005). An alternative explanation suggests that other risk factors (e.g., substance/alcohol abuse) may moderate the mental health-assaultive behavior relationship than for offenders with singular mental health disorders (Houser, Belenko, & Brennan, 2012). While there is limited research on the relationship between mental health variables and juvenile institutional misconduct in general, and even fewer studies examining the effects of mental health on assaultive behavior among adolescent youth, these two areas of research need further investigation.

Prior commitments for Black state committed youth decreased the likelihood of youth assault and institutional danger. Black youth with prior commitments may have learned the consequences of assaulting others from previous commitments, such as a denial of parole, a transfer to more secure facilities, or a loss of transition eligibility to least restrictive environments compared to other racial/ethnic groups (Rembert et al., 2017). This finding is consistent with previous research reporting prior incarceration increasing the likelihood of violent misconduct in the adult literature (Cunningham & Sorensen, 2006; Lahm, 2009), but inconsistent with other studies (Morriset al., 2010). One explanation for these null or mixed findings can be found in Drury and DeLisi (2010) work. They argue that examining prior incarceration without measuring the prior history of institutional misconduct will overestimate the effects in predicting institutional misconduct. Because we did not have any measures of prior history of institutional misconduct in the current study, future research should examine whether the prior history of assaultive misconduct during prior commitments is related to assaultive misconduct during subsequent commitments.

For both Black and White state committed youth, an inverse relationship was observed between the history of jail/imprisonment of persons who were ever involved in the household for at least 3 months and institutional danger. Although this relationship cannot be definitively answered, we infer that a person with a history of incarceration in the household teaches the youth how to avoid committing assaultive infractions, because their contact with the outside world (e.g., mail, telephone calls, and visitation), liberties, and their release date are contingent upon their actions. An alternative explanation is that a person with a history of incarceration in the household teaches the youth how to fight or assault others to avoid detection by the officers. Examples of avoiding detection can include teaching youth how to use lookouts to warn them of the impending approach of correctional officers or assaulting others within the area of surveillance camera blind spots. Another example is assaulting others during mass movement of youth to meals, work, and recreational activities when the youth-officer ratio increases and the ability of correctional of detect rule violation decreases. To best of our knowledge, no studies have specifically examined the relationship between persons previously imprisoned in the household for at least three months and institutional danger (or any assaultive behavior).

9. Limitations

This study has several limitations that must be noted. First, this study was limited by its reliance on official data for youth assault and institutional danger as dependent variables. The problem with using official data is that it does not reflect assaults undetected by correctional officers or youth given impunity by correctional officers for assaulting others (DeLisi, Caudill, et al., 2010; DeLisi, Drury, et al., 2010). We could have used self-reported data, but this type of data can under- and over-estimate assault (Breuk, Clauser, Stams, Slot, & Doreleijers, 2007). Future research should use both official and self-report data to produce a complete empirical picture of assaultive behavior in juvenile correctional facilities.

Second, our sample size was only representative of low-risk male youth. The findings of this study might not generalize to high-risk male youth with more serious offenses, longer lengths of stay, and those confined to higher levels of security. It would be interesting to see if our results could be replicated using a sample of high-risk offenders. Future work should be undertaken to investigate youth confined for longer periods of time and structural features of the correctional environment such as security levels and officer-to-youth ratios to determine whether the PACT-PS is effective at predicting assault.

Third, this study did not examine the effects of retaliatory attitudes, perceived threats, restoring self-worth, or protecting one's reputation on youth assaults and institutional danger. Previous research has demonstrated that these factors are related to assaultive behavior (e.g., Copeland-Linder, Johnson, Haynie, Chung, & Cheng, 2012; Wulf-Ludden, 2013). Bennett and Brookman (2009) found that youth would resort to violence to increase their status among peers, when treated disrespectfully by peers, or to seek revenge. Further studies are needed to validate violence-related attitudes and beliefs to reduce the likelihood of assaultive behavior. Despite these limitations, the present study has made a significant contribution to community-based PACT-PS literature as being one of the few studies to examine this instrument in a juvenile correctional setting among a diverse group of state committed youth.

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